

Health Transition Review

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ISSN 1036-4005

Published by the Health Transition Centre, National Centre for Epidemiology and Population Health,
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Annual subscription: *Health Transition Review*, Health Transition Centre, Fax 61-6-249-0740 or Jeff.Marck@anu.edu.au

Publication frequency: April and October.

Printing by Better Printing Service, Queanbeyan, NSW

Cover design by Graphic Design Unit, The Australian National University

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Preface



The papers in this volume were presented at a seminar held in Canberra, Australia in August 1995 to celebrate the distinguished career of the editor of *Health Transition Review*, Professor John C. Caldwell known usually as Jack. The Symposium was centred on the theme of 'The Continuing Demographic Transition', and it brought together demographers, anthropologists, epidemiologists, sociologists, economists, and statisticians who have been influenced by the work of Caldwell and his wife, Pat. That is the common theme which runs through the rich and diverse offerings of this and the other two major publications that have emerged from the seminar.¹

Improved understanding of the transitions in demography, epidemiology and health which are taking place at different rates and in profoundly different ways in differing population groups, has become urgent. How else will policy directed towards the stabilization of world population growth be grounded? The papers presented in this volume cover the gamut of issues from sexual initiation, to marriage customs, to women's education, to life course perspectives, biomedical models of health, the nature of transition research and the social and political environment that surrounds these transitions.

Is there a simple story that emerges from all of this? The answer is: not nearly as simple as it seemed when demographers first set out to explain the profound shifts in mortality and fertility that were taking place in the industrialized world in the late nineteenth century. A unifying grand theory has been neither articulated nor postulated. Health, reproductive, educational, and economic decisions by humans are products of the complex interplay of social, biological, cultural and political forces which vary in their emphasis across time and place.

What the Caldwells have taught us all is that transition research demands a marriage of the quantitative and qualitative sciences, a willingness to immerse ourselves in the human detail of life decisions, and a capacity then to stand back and place the findings in a broader frame. The papers presented here cross the spectrum of that activity. And they portray a dilemma for population scientists as we approach the millennium.

The dilemma is this: how will this smorgasbord of growing understanding be most effectively translated into useful public policy? The evidence is growing rapidly that human numbers are outstripping their ecological niche. The sustainability of our unprecedented levels of life expectancy is being seriously questioned.² How will the world scientific and research communities deal with these issues in the next century? Will the study of human transitions continue as exemplified here as *ad hoc*, investigator-driven, and largely intellectual activity,

¹ *The Continuing Demographic Transition*, ed. G. Jones, R.M. Douglas, J. Caldwell and R. D'Souza, to be published by Oxford University Press; *The Third World AIDS Epidemic*, ed. I.O. Orubuloye, J. Caldwell, P. Caldwell and S. Jain.

² *Climate Change and Human Health*, ed. A.J. McMichael, A. Harris, R. Sleef and R.S. Kovats, Geneva: WHO 1996.

or will there be a coherent effort by the world community to use this and future research systematically to develop population policy? Some of us at the meeting saw the need for this research to move now into high gear, to develop a policy arm and to be housed in a prestigious international institution that could interact freely with national and international governments and population agencies.

The John C. Caldwell seminar would not have been possible of course without its central figure, whose seminal contributions to transition theory are now widely acknowledged. But it also depended heavily on the activities of Dr Gigi Santow, a former editor of *Health Transition Review*, who worked unstintingly to ensure the intellectual integrity of the program. It also rested on a range of sponsoring bodies who provided support for authors to attend the meeting. For that we sincerely thank the Ford Foundation, the Rockefeller Foundation, the Andrew W. Mellon Foundation, the Academy of the Social Sciences in Australia, the Australian Population Association, the Australian Agency for International Development (AusAID), the Commonwealth Department of Human Services and Health, the International Union for the Scientific Study of Population, the Overseas Development Administration, the Population Council and the Research School of Social Sciences and the National Centre for Epidemiology and Population Health at the Australian National University.

R.M. Douglas
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Fertility transition in England and Wales: continuity and change *



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Abstract

The focus of this paper is whether the transition from high to low fertility reveals continuity or discontinuity with the past. Our analyses of districts of England and Wales over time reveal an overall picture of continuity. Specifically, we show that (1) a substantial proportion of districts experienced pretransition variations in marital fertility that were so large that they are suggestive of deliberate fertility control; (2) the changes over time in the distributions of marital fertility levels and the relative importance of marital fertility levels to the determination of overall fertility levels were gradual and smooth; (3) the proportion of districts dominated by marital fertility variation, as opposed to nuptiality variation, increased gradually over time, and both marital fertility and nuptiality variations were present in all periods considered; and (4) there are important relationships between changes over time in marital fertility and socio-economic variables in periods both before and after the transition. The last conclusion is based on our estimated equations from the pooled cross-sectional, time-series data. Moreover, these estimated equations reveal relationships between changes in specific explanatory variables and changes in marital fertility that are very similar both before and after the onset of the transition.

Continuity or discontinuity in processes of the fertility transition

Declines in fertility levels began in many west and northwest European countries during the last quarter of the nineteenth century. Classification of time into pre-transition and post-transition periods has become a common practice in many studies of fertility processes. This paper deals with the continuity or discontinuity of various aspects of fertility processes during pre-transition and post-transition periods. One interpretation of the term continuity, in the context of fertility transition processes, is that both marital fertility and nuptiality were important determinants of overall fertility before and after the onset of the fertility transition.

* Revision of paper presented at the John Caldwell Seminar on the Continuing Demographic Transition, Canberra, August 14-17, 1995. We would like to thank Sharon Segal for excellent research assistance, as well as Calvin Goldscheider, Carole Feldmann, Sammy Krikler, and German Rodriguez.

In this introductory section, we discuss marital fertility and nuptiality in turn. Clearly, marital fertility control played an important role in post-transition fertility processes. However, there remains the controversial question of whether pre-transition populations practised marital fertility control to any significant degree. If populations exercised marital fertility control both before and after the transition, then one criterion for the continuity of

fertility processes is met. If not, then the fertility transition can be described as a radical departure from traditional behaviour.

In addition to considering whether pre-transition populations practised marital fertility control, we reflect on the question of the continuing importance of nuptiality, after the transition. It is well established that nuptiality was an important factor affecting overall fertility in Europe before the transition to lower levels (Hajnal 1965; Smith 1981; Friedlander 1992). Did nuptiality remain an important determinant of overall fertility after the transition, or was its role usurped by marital fertility? If nuptiality remained an important determinant of overall fertility after the transition, then another criterion for the continuity of fertility processes is met.

Judith Blake (1985) argues that the processes of fertility transition are continuous, rather than discontinuous, in nature. Our interpretation of continuity implies that changes in fertility are gradual and smooth and that explanatory models of fertility reveal similar patterns before and after the transition. This aspect of continuity in the transition process can be considered and evaluated in several ways. Our focus on small geographic units, districts of England and Wales over time, allows us to consider changes in the cross-sectional distributions of levels of, and time-variations in, marital fertility and nuptiality, over the course of the fertility transition. For example, we ask whether the distributions of marital fertility and nuptiality across geographical units reveal a gradual shift to lower fertility levels over time, or whether changes in the distributions are abrupt. Is there a large degree of overlapping in the distributions in consecutive periods? We associate changes that are gradual and smooth with continuous fertility processes; changes that are abrupt are reflections of discontinuous processes.

Explaining fertility change

What kinds of explanatory variables are associated with the transition? The present analysis of explanatory models of fertility focuses only on models of marital fertility. Theories emphasizing the importance of socio-economic variables focus on the changing costs and benefits of children as the major cause of fertility decline. These costs and benefits are functions of the roles of children in the family under varying socio-economic and demographic conditions (e.g. Caldwell 1982). Traditional demographic transition theory can be viewed as one variant of these socio-economic explanations.

Ideational and cultural theories of marital fertility decline, on the other hand, often focus on the importance of the processes of secularization and individuation. One definition of secularization is the declining centrality of religion that engages in institutional regulation of conduct through assertion of norms that restrict individual behaviour (Lesthaeghe and Surkyn 1988). These ideational changes are, in turn, related to growing acceptability of fertility control within marriage (Cleland and Wilson 1987). The secularization of norms and the decline in religion parallel the rise of individual decision-making and the emphasis on individual responsibility.

Which of these two kinds of variables was dominant in the explanation of marital fertility patterns? It seems to us that theoretical considerations and empirical research suggest that a formulation of transition theory in terms of only one of these two alternative approaches is artificial. Even under situations of very rapid socio-economic change that conflicts with sustained high fertility, we would expect that transitional patterns would be affected also by ideational variables. Indeed, differentials in social and religious norms would certainly affect the pace and intensity of fertility changes. Similarly, it would be unrealistic to suppose that even in a society with deeply-rooted cultural norms related to fertility control, socio-economic differentials would not affect the patterns of fertility change. Hence, an appropriate formulation of transitional processes would be in terms of both ideational and socio-economic forces. We expect that culture operates in a socio-economic environment and vice versa.

A distinction should be made between theoretical considerations and actual research limitations. In practice, research environments in which a reasonable selection of both kinds

of variables is available to the investigator are extremely rare. Therefore, analyses that show the existence of significant socio-economic and/or ideational interrelationships with transitional processes, within a consistent theoretical framework, are the best that one can hope for. In this analysis of fertility transition in England and Wales, we are limited to a selection of socio-economic variables. It is important to keep this limitation in mind when interpreting empirical findings.

We believe that another important issue relates to continuity: is there stability in the interrelationships between marital fertility and explanatory variables, both socio-economic and ideational? Do the specific interrelationships between the changes in marital fertility and changes in each of the explanatory variables reveal relative stability before, during and after the transition? This approach to studying fertility transition was introduced by Richards (1977) who considered the changing relationships between marital fertility and explanatory variables during different stages of the transition in Germany.

The identification of ideational explanation with discontinuity and innovation

Many studies have made a theoretical connection between discontinuity in the trajectory of fertility decline and the characterization of fertility control as an innovation in human reproductive behaviour at the time of the fertility transition. It has been argued that 'the shift from natural fertility to family limitation and the resulting decline in marital fertility reflected a radical change in the reproductive behaviour of couples and societies' (van de Walle and Knodel 1980:27). In particular, the fertility transition was interpreted as an innovation in family limitation.¹ This innovative behaviour was understood to have been linked to ideational change. The identification of ideational change with discontinuity followed from this linkage.

Here, we challenge the identification of ideational change with discontinuity of fertility processes. Ideational change may be an important explanatory factor of fertility change, even if fertility control was practised, albeit to a more limited extent, before the onset of the transition. Ideational change may occur smoothly over time, leading to gradual changes in fertility behaviour.

Thus, while continuity of fertility processes is inconsistent with the theory of family limitation as an innovation in reproductive behaviour, a finding of continuity of fertility processes does not necessarily identify the causes of the fertility decline. It is likely that both sets of variables, socio-economic and ideational, may be associated with continuity of fertility decline.

Outline of this paper

In the next section, we describe our data and variables. In the third section we describe changes in the distributions of marital fertility and nuptiality over time, in an attempt to assess the continuity of fertility processes across different periods surrounding the onset of the fertility decline. In the fourth section we investigate the relationships between marital fertility change and changes in explanatory variables, in order to assess the importance of socio-

¹ Conclusions concerning the occurrence of an innovation in marital fertility control in the form of parity-dependent control were largely based on the small magnitude of estimated Coale-Trussell *m* values for a limited number of pre-transitional populations. Criticisms of this line of research centre, among other things, on measurement problems associated with *m* (Okun 1994) and on other evidence that suggests that regulation of marital fertility was present in pre-transitional societies (Livi-Bacci 1968; Lee 1978; Blake 1985; David et al. 1988; Friedlander and Okun 1995; Santow 1995).

economic explanation of fertility change, and provide an evaluation of the continuity of these relationships over time. We end the paper with a summary and concluding remarks.

Data and variables

Our analyses of England and Wales are based on official census and vital registration data that were published regularly for each of over 600 registration districts from the middle of the nineteenth century. Marital fertility and overall fertility are measured in terms of Coale's standard I_g and I_f indices (Coale and Treadway 1986). Given that births were not reported by age of mother until the 1930s, we cannot calculate more refined fertility measures. Nuptiality is measured by Coale's index I_m , as well as by the proportion of women ever-married at ages 20-24.

Published volumes of seven censuses provided age, sex, marital status, and occupational status distributions for each district. Vital registration provided the intercensal numbers of births and deaths. Adjustment for underregistration of births in each district was performed using the same procedure applied by Teitelbaum (1974) to county data. Essentially, census reports on the size of the 0-9 age group were used to estimate the number of births during the preceding decade, by back projections. The estimation procedure was applied to each of the 600 registration districts of England and Wales, for each of the seven decades 1851-1911. The estimates from this first stage were then modified to allow for the annual rate of change in the number of births as well as for the rate of net migration. The estimated births obtained were compared to the registered births, and corrective factors were thus calculated. On average, our corrective factors were similar to those found by Teitelbaum, and did not change estimated numbers of births by more than seven per cent. I_g and I_f values are based on ten years of births from vital registration, thus adjusted. While I_g is an imperfect reflection of the changing behaviour associated with the marital fertility transition, it provides the basis for an examination of marital fertility and its relation to socio-economic conditions (Guinnane, Okun and Trussell 1994).

Time-series variations in district-level marital fertility are the basis of our analyses. The date of the onset of the marital fertility decline is estimated for each district. The date of the onset of decline in marital fertility is typically taken here as the year corresponding to the value of I_g which immediately precedes a sustained decline. The maximum likelihood procedure used for the estimation of the date of the onset of the transition — T_1 — is presented in detail in Friedlander, Pollak and Schellekens (1993).

By defining the onset of the transition as the year corresponding to the maximum value of I_g before a sustained decline, rather than as the year in which I_g attains a value that is 10 per cent lower than its maximum value (as was done in the European Fertility Project), we maintain a stricter criterion for categorizing periods as pre-transitional. This definition is used in order to minimize misclassification of transitional periods as pre-transitional and vice versa. Since one of our main goals is to study relationships of I_g to socio-economic variables in pre-transition periods relative to relationships in transitional periods, it is important to distinguish between the two.

There is an added intricacy to our classification of periods as pre-transitional or transitional because our values for I_g refer to ten-year periods (see above), while the estimates of the time of the onset of the transition — T_1 — is a single year. Thus, we define the decade during which the onset occurs as pre-transitional if the onset occurred more than half-way through the period; otherwise the period is categorized as transitional. In this way, we reduce as much as possible misclassification of the two types of periods.

District populations vary in size, with a median population of 20,000, a lower quartile of 14,000, and an upper quartile of 31,000 in 1861. One advantage of our analysis is that the district populations are much smaller and more homogeneous than the province-level

populations used in the European Fertility Project. At the same time, the district populations are larger and subject to much less random variation than populations based on village reconstitutions (see for example Levine 1977).

Occupational distributions, compiled separately for men and women in 1861, 1871, and 1881, are derived from census returns. The aggregated occupational categories that are used in our analyses are tertiary (professional and commercial), industrial, domestic, and agricultural. Also, we have used information on the number of men and women engaged in teaching in order to compute a ratio of teachers to the adult population. We use the ratio of teachers to the adult population, rather than the ratio of teachers to the population of children, as an explanatory variable in our fertility equations in order to avoid statistical problems that arise from the fact that the number of children is closely related to the dependent variable. The ratio of teachers to the adult population provides a measure of the quality and quantity of children's education. Children's education is an important measure of the costs of children to parents (Caldwell 1982). Other explanatory variables which will be used in our analyses include the logarithm of population density, which is the ratio between the total population and the acreage of the area. Density is a measure of urbanization. For further details concerning the definition of most of these variables see Friedlander (1983).

The continuity and change in distributions of marital fertility

Changing distributions of marital fertility and comparisons to nuptiality

Figure 1a contains boxplot diagrams of Ig values across districts in periods from 1851 to 1911. Clearly, the distributions of Ig values begin moving to the left, to lower levels of marital fertility, from 1871. Although there are increases in marital fertility in some districts after 1871, there is an overall decline in marital fertility after this period. Indeed, it is well known that the decade 1871-1881 marks the beginning of the onset of the fertility transition for many English districts. More important for our argument here is the gradual change in the distributions: that is, in the process of decline. There is enormous overlap between distributions of Ig in consecutive decades. We interpret this gradual change as an indicator of the continuity of fertility processes.

Figure 1a
Ig values across districts in periods from 1851 to 1911

Figure 1b presents boxplot diagrams of the proportion of married women aged 20-24 in consecutive decades. We also observe declines in nuptiality, starting from the last quarter of the nineteenth century. There is a striking similarity between marital fertility change and nuptiality change in the pattern of overlapping and gradually shifting distributions. Despite the great similarity between the two sets of distributions, the change in marital fertility has often been described as abrupt, while no similar description has been applied to changes in nuptiality.

The contribution of marital fertility to maintaining low levels of overall fertility

It is well-established that overall levels of fertility in historical Europe, including England, were well below the biological capacity of childbearing. Low levels of nuptiality explain a large part of this low fertility (Coale and Watkins 1986). It is of interest to trace the continuity and change in the relative importance of marital fertility and nuptiality in maintaining low overall fertility, during the various stages of overall fertility decline. The innovation view of fertility transition suggests that the relative importance of marital fertility should increase abruptly at the time of the transition, while a view emphasizing continuity would suggest gradual change.

We calculate an index of the relative importance of marital fertility in maintaining a given level of overall fertility by computing the ratio of I_m to I_g values in each period. The larger the ratio between I_m and I_g , the larger the relative contribution of marital fertility in keeping the level of overall fertility low. Figure 2 presents the boxplot distributions of the values of these ratios in each decade, over the districts. We note that there is a movement to the right in these distributions; that is, there is an increase in the relative contribution of marital fertility over time. Note, however, that this shift to the right is very gradual, and takes place over several decades. Thus, Figure 2 suggests the appropriateness of the more continuous, long-term view of the changing importance of marital fertility control, rather than the argument about abrupt changes in fertility.

Figure 1b
Proportion of married women aged 20-24 in consecutive decades

Short-term variations in marital fertility

Another aspect of fertility processes can be considered by examining changes in Coale's marital fertility and nuptiality indices over time in each district. To quantify the short-term variability of I_g , we compute the ratios of I_g values in different decades in each district, and multiply the ratios by 100. For example, if I_g in one district takes on the value of 0.80 in the decade 1851-1860, and the value 0.75 in the decade 1861-1870, we compute the change in I_g values between the consecutive decades as $100 \times (0.75/0.80) = 94$. Thus, values of less than 100 indicate a decrease in I_g between two decades; values greater than 100 indicate an increase between two decades.

In Figure 3, we portray the distributions of changes over time in marital fertility across districts, using boxplots. Each boxplot refers to the change between two consecutive decades; for example, the first distribution refers to changes in I_g values between the decades 1841-1850 and 1851-1860. There are three important points here. First, in each plot, including the plots that refer to the earlier periods, there is substantial variation across districts in the time-variability of I_g . Note that in every period, there are both increases and decreases in I_g . Over time, the balance between increases and decreases slowly moves towards greater decreases. This portrayal of fertility processes differs from previous research findings that show consistent stability in I_g values before the transition. Second, we see that over the decades 1841-1911, the boxplot slowly moves to the left, after an initial move to the right. This means that over the seven decades, the median change over time in I_g becomes increasingly large and negative. However, this change is not abrupt; rather we witness a gradual acceleration in median declines in I_g . Third, we note that there is very substantial overlap in the distribution of changes over time in I_g . The boxplot for each pair of consecutive decades overlaps to a large degree with the boxplot of the preceding and following pairs of decades. These three points are not consistent with a view of transition as an abrupt change.

Figure 2
Relative contribution (CONT) of I_g to reduction of IF

Figure 3
Decennial change in district Ig values, 1851-1911

Note: CHIG refers to $100 \times \text{ratio of district values in consecutive decades}$, e.g. $\text{CHIG6151} = 100 \times \lg 1861 / \lg 1851$

Each boxplot in Figure 3 indicates that there was variation across consecutive decades in district-level Ig values. We now consider whether these variations were large enough to suggest non-random changes in Ig. Clearly, random variation in the ratios of Ig values will depend on population sizes in the relevant districts: larger districts will have less random variation. An estimate of the variance of the ratio of Ig values enables us to compute critical values of the ratios of Ig according to district population size. For example, we can calculate the proportion of district populations that experienced non-random variation in Ig values between the decades 1841-1850 and 1851-1860, at the five per cent significance level (see Friedlander and Okun 1995 for further details). Table 1 presents the cumulative proportions of districts in which non-random variations occurred. The cumulative proportion of districts that experienced non-random variation in Ig levels rises quickly over time, so that by the last period considered, all districts had experienced such change. If we disaggregate the districts into agricultural and non-agricultural groupings, we note that agricultural districts tend to experience less non-random change than non-agricultural districts, as may be expected.² Even in the earliest period, almost 50 per cent of the districts experienced non-random variation in Ig values between the decades 1841-1850 and 1851-1860. Earlier analyses suggest that in many instances, pre-transitional marital fertility variation over time was so large that it

² See Friedlander (1983) for details on the classification of districts into socio-economic types.

suggests changes in deliberate attempts to control marital fertility (Friedlander and Okun 1995).

The emerging dominance of marital fertility in short-term variations of overall fertility

Which demographic response, nuptiality or marital fertility, is dominant in its effect on changes in overall fertility? This question differs from the issue we discussed earlier, concerning the relative contribution of marital fertility and nuptiality in explaining the levels of overall fertility; here we attempt to disentangle the relative dominance of nuptiality and marital fertility with regard to changes in overall fertility.

Table 1
Cumulative percentage of districts experiencing non-random variation in marital fertility by time period and agricultural status

Date by which non-random variation occurs	All districts	Agricultural districts	Non-agricultural districts
1851-1860	48	36	58
1861-1870	71	63	79
1871-1880	83	77	88
1881-1890	93	90	97
1891-1900	98	97	100
1901-1910	100	100	100

Our definitions of short-term, time-series variations in nuptiality and overall fertility are analogous to our definition of time-series variation in marital fertility (see above); that is, variation in nuptiality and overall fertility is measured as 100 times the ratio of I_m (and I_f) values from two different time periods. Suppose that in a given district, the nuptiality, marital fertility and overall fertility responses are 99, 91, and 90, respectively. Suppose that in another district these values are 93, 100, and 93. In the first example marital fertility dominates, while in the second example the nuptiality response dominates. In yet another example, these responses might be 105, 104, and 109. In this last example, the two effects are similar in their magnitude so that both contribute to the change in overall fertility. Clearly, in many cases there are no significant responses in overall fertility at all: for example when these values are 101, 101, and 102.

Here we examine nuptiality, marital fertility and overall fertility changes over non-consecutive periods.³ For example, we examine nuptiality, marital fertility, and overall fertility levels in the decade 1861-1870 relative to the corresponding levels in the decade 1841-1850. Likewise we examine analogous changes between the decades 1871-1880 and 1851-1860, 1881-1890 and 1861-1870, 1891-1900 and 1871-1880, and lastly, 1901-1911 and 1881-1890. In a small minority of the districts, there was no substantial change in I_f . In these cases, there is no need to explain changes in overall fertility; thus, we do not consider this section of the analysis.

Table 2 presents the frequency distribution of districts by dominance of marital fertility or nuptiality response. The first panel, which refers to all districts, shows that between 1841-

³ We examine changes over two non-consecutive decades, rather than over two consecutive decades, because we recognize that I_m is inherently sluggish relative to I_g ; that is, I_m generally does not change as rapidly over a short period of time. This is so because I_m is a function of the marital status distribution of the population; unlike I_g , I_m is not directly a function of vital events.

1850 and 1861-1870, 35 per cent of districts are characterized by a dominant marital fertility response, 36 per cent by a dominant nuptiality response, and 28 per cent by roughly equal nuptiality and marital fertility responses. In the later periods, the proportion of districts characterized by dominance of I_g response increases, while the proportions characterized by dominance of I_m response or by roughly equal marital fertility and nuptiality responses declines. We note also that the second and third panels reveal that in industrial and urban-commercial districts, the marital fertility response is more likely to dominate than in agricultural districts (see footnote 2).

Although the fertility transition is characterized by large increases in the dominance of I_g over time, there remains a substantial minority of districts characterized by dominance in nuptiality response in all but the last period. In contrast to other views of the fertility transition which emphasize the sole importance of changes in I_g during the transition, the evidence presented here shows that changes in both I_g and I_m were important in the process of overall fertility change before, during, and after the transition.

Table 2

Frequency distribution of changes in overall fertility by dominance of response by marital fertility or nuptiality

	1851-1870	1861-1880	1871-1890	1881-1900	1891-1911
All districts					
Dominance of I_g	0.35	0.38	0.53	0.58	0.86
Dominance of I_m	0.36	0.25	0.15	0.12	0.03
Equal responses	0.28	0.38	0.29	0.29	0.12
Industrial and urban/commercial districts					
Dominance of I_g	0.45	0.39	0.77	0.79	0.88
Dominance of I_m	0.35	0.30	0.09	0.06	0.06
Equal responses	0.20	0.30	0.13	0.15	0.06
Agricultural districts					
Dominance of I_g	0.36	0.38	0.46	0.51	0.89
Dominance of I_m	0.32	0.23	0.17	0.15	0.01
Equal responses	0.32	0.38	0.27	0.33	0.10

What lies behind the fertility processes?

We suggest above that marital fertility processes during the 70-year period under study are continuous in a descriptive sense. In the process of transition, we observe the gradual declines in marital fertility, and at the same time, a gradually increasing relative importance of marital fertility over nuptiality in determining both levels and changes in overall fertility. We now ask what were the socio-economic and demographic factors underlying these fertility processes. We consider whether socio-economic explanations of fertility change are continuous, in the following two ways. First, are explanations of cross-sectional differences in marital fertility similar to explanations of marital fertility change over time? Second, are explanations of marital fertility change over time similar in periods before and after the onset of the fertility transition?

We begin with an analysis of cross-sectional variation in marital fertility, and in the next section, we move on to cross-sectional and time-series analyses. Cross-sectional relationships between socio-economic variables and marital fertility levels at a point in time are indicative not only of structural relationships at that time; they are also suggestive of the kinds of relationships which existed before that time. For example, we suggest that variables, such as urbanization and education, that have significant and substantial explanatory power in the

cross-section during the period 1851-1860 (see below), reflect relationships between these explanatory variables and fertility processes during even earlier periods, for which we lack data. If these same variables also explain variations in marital fertility over time in periods for which we do have data, then we have some support for the view of the continuity of fertility processes. On the other hand, if we find that cross-sectional marital fertility interrelationships bear little resemblance to time-series interrelationships that we observe in the data, then this would cast doubt upon the continuity of fertility processes. As we show below, both our cross-sectional and time-series analyses indicate that there are important relationships between marital fertility and specific socio-economic variables.

Consider the simplest type of cross-sectional model. We take values of I_g during the decade 1851-1860 as well as explanatory variables in 1861. The explanatory variables include the logarithm of density, the proportions of the male workforce engaged in industry, and the ratio of teachers to population aged 20+. We find relationships in the expected directions in all three cases (standardized regression coefficients presented in parentheses): marital fertility is negatively related to density (-0.42), proportions in industry (-0.08), and the ratio of teachers to population aged 20+ (-0.37). All of the explanatory variables are statistically significant at conventional levels, and the model has an R^2 of 0.37.

Pooled cross-sectional time-series models

We now explore models of changes in I_g over time and across districts. We show in the following analyses that in periods both before and after the onset of the transition, changes over time in marital fertility can be explained in terms of changes in urbanization, occupational structure, and other socio-economic variables. We argue that marital fertility processes are continuous, because of their close connection to the same set of explanatory variables both before and after the onset of the transition. Our findings of continuity in fertility processes are consistent with the findings discussed earlier. We first provide a technical explanation of our analyses, and then move on to provide intuitive explanations and interpretations of our results. Readers less interested in the technical explanation may move directly to the Results section.

We estimate four models, using cross-sectional and time-series data on I_g and explanatory variables for 535 districts in three different time periods: 1861-1870, 1871-1880, and 1881-1890. In the first model, we have a pooled regression of 1605 (535×3) observations. In this model, we allow the intercept of the regression model to differ in periods before and after the onset of the marital fertility transition. That is, for each observation in each district, a dummy variable takes on the value zero for each observation which dates before the onset of the transition, and the value one otherwise. The statistical significance and importance of this dummy variable allows us to test, in a multivariate framework, whether there was an important, unexplained change in the level of I_g following the onset of the transition. In comparing this model with the cross-sectional models discussed above, we note that the time-series nature of this model allows us to test the significance of the 'before-after' effect, while this is clearly impossible in a purely cross-sectional model. We will refer to this model as the 'before-after' model. It has at least two disadvantages: it forces the relationship between I_g and the explanatory variables to remain constant over time; and it mixes together cross-sectional relationships (across districts) with time-series changes.

To address the first problem, in the second model, we generalize the 'before-after' model to allow the regression coefficients to differ between periods before the onset of the transition and periods after the onset of the transition. Specifically, we introduce interaction terms between the explanatory variables and the 'before-after' dummy variable. Thus, we allow the multivariate relationships to change following the onset of the transition. These interaction effects enable us to distinguish how, if at all, the relationships between marital fertility and the

explanatory variables differed in the two periods. We will refer to this second model as the 'before-after model with interactions'.

Figure 4 presents three examples of changes in the relationships over time. For illustrative purposes, we focus here on the changing negative relationship between I_g and population density, before and after the onset of the fertility transition (at T_1). In the first panel of the figure, there is no change in the slope of the relationship between I_g and population density, but there is a negative change in the intercept: that is, the values of I_g are lower after T_1 , for all levels of population density. In Panel B, we witness both a change in the intercept (as in Panel A), and an increase in the slope of the relationship. That is, in Panel B, the negative relation between I_g and population density becomes somewhat weaker after T_1 , as compared to before T_1 . In Panel C, the slope takes on a larger negative value after T_1 than before T_1 , and there is a downward movement of the intercept. These three panels illustrate the types of changes in the relationships we see in the 'before-after' model (Panel A only) and the 'before-after model with interactions' (all three panels).

It is important to note that neither of these two models separates the cross-sectional effects from the time-series effects (the second problem noted above). The isolation of the time-series effects is important for the study of transition processes. We now introduce the third and the fourth models which focus on time-series changes. Only by controlling for the overall level of the dependent variables in each district can we analyse changes over time in the dependent variables. This is accomplished by introducing a fixed effect for each district. The fixed effects are simply dummy variables that capture the 'characteristic' level of marital fertility in each district. This 'characteristic' level is presumably determined by other important variables, which we do not have at our disposal. The dummy variables for each district help to control for these missing variables. In the third model, we build on the first model, the 'before-after model', by adding in fixed effects. In the fourth model, we build on the second model, the 'before-after model with interactions', by adding fixed effects. We refer to the third model as 'fixed effects model without interactions' and to the fourth model as 'fixed effects model with interactions'.

Results

Theory linking marital fertility with socio-economic and demographic variables suggests that there are negative relationships between marital fertility, on the one hand, and, on the other hand, socio-economic variables such as population density, proportion in tertiary occupations, proportion in domestic occupations, and the ratio of teachers to the adult population. These relationships have been shown to exist in this paper and elsewhere, primarily in cross-sectional studies (see e.g. Friedlander, Schellekens and Ben-Moshe 1991; for an opposing view, see Woods 1987). We show now that interrelationships among demographic and socio-economic variables that we observe in the patterns of change over time are similar to those in the cross-section. Moreover, the interrelationships which explain changes over time in the pre-transition period are similar to the interrelationships in the period following the onset of the transition. These analyses provide support to the view of transition as a continuous response to changing socio-economic circumstances.

Figure 4
Schematic view of 'before-after' models

a: Model with no significant interaction terms between time and explanatory variables

b: Model with positive interaction terms between time and explanatory variables

c: Model with negative interaction terms between time and explanatory variables

Table 3 presents the results of all four multivariate pooled regression models. As discussed above, while the first two models mix cross-sectional effects with time-series effects, the final two models present pure time-series effects. Broadly, the models fit the data

well, and the main effects of our explanatory variables are consistent across the different models. For example, consider the main effects of the education variable, proportion of teachers in the adult population, on marital fertility. In each of the four models, we see a negative relationship between these two variables.

In the final models, the negative effect persists, and even becomes larger. This suggests that increases in education over time are associated with declining marital fertility: a finding that lends support to the view that the fertility transition was driven by changing socio-economic circumstances. Likewise, we note that reductions in marital fertility over time are associated with increases in urbanization, and the proportions of the male workforce employed in industrial, tertiary, and domestic occupations. The urbanization variable and the first two of the occupational variables are related to the degree of economic development in districts, while the proportion in domestic occupations may be positively associated with the level of economic and social status in a district. Thus the main effects of all five of these variables are consistent with an explanation of fertility decline that has an important socio-economic dimension. We also note that in both of the final 'fixed effects' models, the standardized regression coefficients (β) are largest for the urbanization and education variables. That is, marital fertility is most sensitive to changes in these explanatory variables.

By examining the results in models (2) and (4), we can determine whether the relationships between Ig and the explanatory variables differ significantly in periods before and after the onset of the fertility transition. The lower panel of Table 3 reports interaction effects of the explanatory variables with the before-after dummy variable. The interaction effects represent the differences in the relationships between Ig and the explanatory variables in the two different periods. We note that all of the interaction effects are small relative to the main effects. For example, the positive interaction effects of proportion of teachers and population density do not substantially change the overall negative effects of these variables on marital fertility. Thus, changes in education and urbanization in periods following the onset of the transition were associated with changes in marital fertility in much the same way as changes in education and urbanization were related to variations in marital fertility before the onset of the transition. A similar pattern of relations exists between marital fertility and the other socio-economic explanatory variables. Referring back to Figure 4, we observe that these findings fit the schematic depiction in the top two panels, in which the interaction effects were zero or slightly positive.

Table 3
Regression analyses of marital fertility using pooled data

Explanatory Variables	Models							
	Before-after		Before-after with interactions		Fixed effects without interactions		Fixed effects with interactions	
	(1)		(2)		(3)		(4)	
Main effects	B^a	β^b	B^a	β^b	B^a	β^b	B^a	β^b
% of teachers ^c	-5.8*	-0.25	-5.7*	-0.24	-9.5*	-0.40	-9.4*	-0.40
Log of pop. density	-1.5*	-0.35	-1.6*	-0.35	-2.7*	-0.61	-3.9*	-0.88
% of men in industrial occ.	-0.0	-0.02	-0.0	-0.02	-0.1	-0.10	-0.1**	-0.13
% of men in tertiary occ. ^d	-0.2*	-0.17	-0.2*	-0.18	-0.1**	-0.15	-0.1**	-0.15
% of men in domestic svc.	-0.0	-0.02	-0.0	-0.01	-0.3*	-0.11	-0.5*	-0.18

Before-after dummy	-3.1*	-0.28	-3.3*	-0.29	-2.8*	-0.25	-2.7*	-0.24
Interaction effects with before-after dummy								
% of teachers	NIM	NIM	0.9	0.02	NIM	NIM	1.9**	0.04
Log of pop. density	NIM	NIM	0.8*	0.09	NIM	NIM	0.6**	0.07
% of men in industrial occ.	NIM	NIM	-0.0	-0.02	NIM	NIM	0.0	0.00
% of men in tertiary occ.	NIM	NIM	-0.0	0.00	NIM	NIM	0.0	0.00
% of men in domestic svc.	NIM	NIM	0.1	0.02	NIM	NIM	0.2**	0.05
Adjusted R ²	44		.45		.75		.76	
Joint significance of explanatory variables	209.7*		116.8*		229.2*		133.5*	
Joint significance of fixed effects	NIM		NIM		4.7*		4.9*	

Notes: NIM: Not in Model, ^a (Regression coefficient) *100, ^b Standardized regression coefficient, ^c Ratio of male and female teachers to population aged 20+, ^d Men in commercial of professional occupations,

* Significant at 0.01 level, ** Significant at 0.05 level.

A conspicuous and important variable in Table 3 is the 'before-after' dummy variable, which differentiates periods before and after the onset of the transition. This dummy variable represents the difference in Ig levels between periods before and after the onset of the transition, after controlling for changes in other explanatory variables. We note that in all models, this variable is associated with a negative coefficient. Obviously, if we were to look at simple averages of marital fertility levels, we would expect periods following the onset of the transition to have lower levels of marital fertility than periods before the transition. Regression results not presented here show steadily declining values (down to 50 per cent) of the estimated coefficient on the before-after dummy variable when additional explanatory socio-economic variables are successively included in the model. However, the significance of the before-after dummy variable, even after inclusion of all available variables, indicates that there remains an unexplained component of the reduction in fertility. In order to get an indication of the importance of the before-after dummy variable, we estimate its contribution to the predicted change in Ig values from periods before the onset of the transition to periods after the onset. Based on the full model (model 4) presented in Table 3, we conclude that the before-after dummy variable accounts for 44 per cent of the explained change in Ig values, while the socio-economic variables account for 56 per cent of the explained change.

The coefficient on the before-after dummy variable can be understood in at least three different ways. First, there may be changes in the qualitative nature of the explanatory variables included in the model; these qualitative changes may affect the levels of marital fertility, at all levels of the explanatory variables. For example, there may be changes in the nature of work, particularly women's work, or education, which have implications for the level of childbearing, at all levels of the explanatory variables. Second, the change in the intercept may be due to missing variables. For example, the labour-force participation of women is omitted from our analyses here through lack of data. In addition, other potentially important socio-economic variables are unavailable for our analysis. Likewise, we have no measures of ideational change, which may be related to an increased use of family limitation in the transitional period. Third, there may have been a discontinuity in fertility patterns,

consistent with innovation in fertility control at the time of the transition. While it is impossible to determine what part of the coefficient on the before-after dummy variable is due to each of these three causes, our analysis suggests that it is unwise to attribute the entire coefficient to innovation. Indeed, it would be very unlikely that any regression model would be able to explain most of the fertility decline, so that the before-after dummy variable would have a coefficient close to zero.

Concluding observations

One analytic issue concerning the transition from high to low marital fertility revolves around the question of whether the change reveals continuity or discontinuity with the past. A perspective of discontinuity has been adopted in studies of the European Fertility Project. It has been argued in these studies that the idea and the practice of family limitation was an innovation, that marital fertility control was virtually unknown in the past, and that the control of overall fertility before the transition was through variations in nuptiality. It was concluded that the use of family limitation was a revolutionary, abrupt change occurring virtually simultaneously in the different provinces of Europe. It was argued that these processes were independent of socio-economic conditions.

The acceptance of this formulation should reveal discontinuity in the empirical analysis of the patterns of change in marital fertility levels as well as in interrelationships between marital fertility and socio-economic variables. Specifically, discontinuity implies an absence of marital fertility control in the pre-transition period; abrupt shifts over time in the cross-sectional distributions of marital fertility levels and the relative importance of marital fertility levels in the determination of overall fertility levels; a sudden change in the form of dominant control of changes in overall fertility, from nuptiality to marital fertility; and an absence of relationships between changes over time in marital fertility and socio-economic variables, in periods both before and after the onset of the transition.

Contrary to the discontinuity perspective, our analyses reveal an overall picture of continuity in the process of marital fertility decline. In this and earlier analyses, we have shown that (1) a substantial proportion of districts experienced pre-transition variations in marital fertility that were so large that they are suggestive of deliberate fertility control. Moreover, other Western European countries experienced pre-transition variations of a similar nature, so that England and Wales is not unique in this sense. (2) The changes over time in the distributions of marital fertility levels and the relative importance of marital fertility levels to the determination of overall fertility levels were gradual and smooth; (3) the proportion of districts dominated by marital fertility variation, as opposed to nuptiality variation, increased gradually over time, and both marital fertility and nuptiality variations were present in all periods considered; and (4) there are important relationships between changes over time in marital fertility and socio-economic variables in periods both before and after the transition. The last conclusion is based on our estimated equations from the pooled cross-sectional, time-series data. Moreover, these estimated equations reveal relationships between changes in specific explanatory variables and changes in marital fertility that are very similar both before and after the onset of the transition.

There is, however, one estimated parameter in the same set of equations which does not support the continuity perspective. Our analyses suggest that after controlling for all available explanatory variables, there remains an important unexplained component of change in I_g values between periods before and after the onset of the transition. Most likely this estimated parameter (the coefficient on the before-after dummy variable) results from the fact that important socio-economic and ideational explanatory variables are missing from our data, and that there may have been changes in the qualitative nature of some of the included variables.

Despite the importance of the before-after dummy variable, our analyses provide strong support for the continuity perspective.

Continuity in the process of changing patterns of fertility means that marital fertility control has always been an important feature of the family, even if it has not always been used extensively and effectively. In the context of late age-at-marriage, in which the family is the dominant institution in which individuals are active socially or economically, and where child mortality is high, the widespread use of marital fertility control was unnecessary. But, as in later periods, the extent of marital fertility control depended on socio-economic conditions. Changes in marital fertility have occurred continuously over time, as fertility control within marriage has always been of critical importance to society.

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The sick and the well: adult health in Britain during the health transition *



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Abstract

Using adult life-long histories of health experience among a group of men and women born in Britain between 1725 and 1874, this paper examines individual health during the mortality decline. The risk of initiating a new sickness declined sharply between the cohorts born in the eighteenth century and those born during 1825-74, but the average duration of each episode increased. As successive cohorts added to their life expectancy, survival time rose more sharply than did well time.

Continuity rather than change is apparent in another aspect of their health experience, the capacity of prior health to predict future sickness and wellness. Among the men and the women and in the eighteenth-century cohorts as well as the cohorts of 1825-74, the degree of wellness or sickness evident early in adult life strongly predicted future sick time for 15 to 20 years, and strongly predicted future sickness events for a longer period still. Moreover, women surpassed men in their propensity to hold on to the health status exhibited in early adulthood.

Two fundamental changes are known to have occurred in health experience in developed countries since the eighteenth century. First, life expectancy at birth advanced from about 30 to some 75 years. Second, the diseases of leading importance as causes of death have undergone shifts through four regimes: infectious, respiratory, organ, and degenerative. Because of the importance of these transformations, depictions of the health transition are typically led by arguments about change. Most of the research undertaken to this point has also focused on aggregate experience, and specifically on death as a gauge of health experience.

This essay directs attention toward individual rather than aggregate experience, examining the adult life-long health experience of men and women born across the period from 1725 to 1874. It focuses on sickness and wellness during the life course, rather than on the issue of survival. And it poses new questions about how long prior health experience — wellness or sickness — influences subsequent health.

Three specific questions will be addressed. First, how did sickness events and sick time accumulate among men and women between cohorts born in the eighteenth century and

*Funding for this research was provided by the National Institutes of Health, grant number R01AG12033-01.

those born in the middle decades of the nineteenth century? Second, how did life and wellness expectations change between those two groups of cohorts, again considering men and women separately?

Third, does prior sickness or wellness influence the course of later health in adulthood? If it does, how long is the effect felt? Two broad hypotheses can be considered. According to one, health experience at the individual level is more or less a random walk, an effect of exposure to hazards that has little to do with prior health experience. According to another hypothesis, health experience early in adulthood both reflects earlier life wellness and sickness, and predicts health in later life. The random walk hypothesis seems particularly likely to obtain in any population whose disease profile is dominated by infectious ailments. The predictive hypothesis, in contrast, seems likelier to obtain in a population beset by respiratory diseases, which more often carry with them deferred effects.

Sources

Adult life-long records of health experience have been extracted from the ledgers of four British friendly societies, self-help organizations whose members paid in premiums in order to draw out sickness and burial benefits. Sickness benefits compensated a member for part of the wages lost during bouts of sickness that lasted at least three days; burial benefits compensated the member's survivors for the costs of a respectable interment. These data reflect health experience across the period 1775-1930. Here attention focuses on two of the four societies, one male and the other female, and both having histories nearly coincidental in time within the period 1775-1914.¹ The Morcott Friendly Society, situated in an agricultural village in Rutland with an 1841 population of 516, was organized in 1774 and began paying out benefits in 1775. It wound up in 1902. The Ashborne Female Friendly Society, located in a manufacturing town in Derbyshire with an 1841 population of 2,158, was organized in 1806 and started paying benefits in 1807; it concluded activities in 1914.² The women who belonged made corsets, worked with lace, and worked as domestic servants.

Both societies engaged medical practitioners to examine candidates for membership and to certify the validity of sickness claims. Both also appointed members to serve as stewards, whose task it was to visit the sick to show an interest in the member's recovery and to verify the validity of the claim. A doctor's authorization was required to initiate and to terminate a claim; the stewards visited weekly to ensure that members receiving benefits had not resumed wellness activities, such as returning to work, going out in the evening, or visiting a tavern. Friendly society rules and practices are discussed in Riley (1987, 1996).

These two friendly societies, along with thousands of others, defined sickness in the same way, as a health condition that prevented the individual from working. That is only one possible definition of sickness. As a threshold distinguishing wellness from sickness, it is certain to differ, at one extreme, from the circumstances that seem to warrant hospitalization or, at the other extreme, from the circumstances that seem to warrant complaining about the state of one's health. Moreover, the friendly society definition of sickness does not equate with the definition a medical practitioner would have applied. In one case the issue was ability to work. In the other the issue was the need for, and perhaps also the capacity to afford, therapy. All of these definitions, and others not mentioned, have value for the attempt to

¹The two societies omitted, one located in the Northamptonshire village of Abthorpe, and the other in the Cardiganshire village of Llangeitho, provide evidence chiefly about cohorts born in the nineteenth century, and thus do not allow the comparisons across time that will be drawn here.

²Leicestershire Record Office, Records of the Morcott Friendly Society, DE 1702/4-11, and Morcott parish registers, DE 2876/2,4, and 6, and DE 3010/1; and Derbyshire Record Office, Matlock, Records of the Ashborne Female Friendly Society, D662 A/PF51-PF103, and Ashbourne parish records for St. Oswald, D662 A/PI 2/2-4.

understand human health experience. What is most important about the friendly society definition is that the same threshold was meant to obtain in these two societies across the entire period of their existence. That does not necessarily mean that a sickness in 1900 meant the same thing as a sickness in 1810. But it does mean that the members gave no evidence, in the rules they set out or in the minutes of their meetings, that they intended to change the meaning of what they called sickness. They used that term to describe illnesses and injuries, and they were confident enough in their own, and in their doctors' and stewards', ability to distinguish sickness from wellness that they did not require diagnoses. For them the important issue was to certify when a member became sick and when he or she recovered.

Table 1 provides some key quantities about the membership and the number of years' exposure to sickness and death in the two societies.³ Many men and an even larger proportion of women joined these two friendly societies only for brief periods. In Morcott the typical new member joined at age 23; most men who left did so within five years of entry. In Ashborne (now called Ashbourne) the typical new member joined at age 22; most women joined when they were single and, upon marriage, decided whether or not to remain members. Many elected to leave at that point, even though the Ashborne society provided childbirth benefits for members who paid an additional premium. Although small numbers of men and women are represented in these two societies, they accumulated impressive numbers of years at risk to sickness, sick time, and sickness events.

Table 1
Characteristics of two friendly societies

	Morcott	Ashborne
Number of members belonging >5 yrs	450	181
Benefit dates	1775-1902	1806-1914
Yrs at risk for members belonging >5 yrs	10,366.5	3,868.05
Net yrs at risk for members belonging >5 yrs	9,675.38	3,028.78
Sickness days	236,966	301,373
Sickness events	2,808	2,023
Deaths	222	93

Sources: See note 2.

Sickness events, sick time, and survival time

The Morcott and Ashborne societies remained in existence long enough to count among their members sizable numbers of men and women born in the second half of the eighteenth and the first three-fourths of the nineteenth century. In this section and the next, part of this experience has been extracted in order to examine changes over time in three gauges of health experience, each of which provides an independent measure: **sick time** measures the

³Risk time and health events are reported only for members who belonged at least five years, i.e., for members with at least four years' exposure. The experience of shorter-term members is omitted because some selection effects are apparent in comparing members who belonged less than five years with members of the same ages who had belonged for longer periods. The Ashborne ledgers record sickness time but not the number of sickness events in the period 26 March 1845 - 25 March 1847. Members sick during that period have been assigned one episode for purposes of assessing relationships between past and future sickness, but that period has been omitted from calculations of sickness rates. Judging from other years, the assignment of a single episode will slightly understate the actual number of sickness events in that some members sick during that two-year period may have experienced more than one episode.

proportion of time during which the average member earned benefits in each age group. **Net incidence** measures the average number of new sickness events⁴ during the period of wellness in each age group. In previous work, incidence has been measured as the number of new episodes divided by the time at risk, including sick and well time. As a gauge, net incidence more faithfully captures the rising risk of a new episode associated with age by deleting sick time from the denominator. **Survival time** measures the average time at risk accumulated by members at each age.

Comparisons will be made among four cohorts: (1) Morcott men born in the eighteenth century, between 1725 and 1799, who died between 1780 and 1883; (2) Morcott men born in the years 1825-1874, who died between 1862 and a date after the society wound up its business in 1902; (3) Ashborne women born in the eighteenth century, between 1770 and 1799, who died between 1812 and 1886; and (4) Ashborne women born in the years 1825-1874, who died between 1870 and a date after 1914, when the society closed. Omitting members born in the period 1800-1824 will strengthen any contrasts associated with the passage of time. A few members born after 1874 have also been left out, but they supply only a few years of exposure, and those only at young adult ages.

Table 2 furnishes a Survivors' Health Table, extracting three quantities for each age group from 20-24 to 75+ and for each of the two male and two female cohorts. In the first column of each panel appears the net incidence of new sickness events. The second column reports the cumulative number of days lost to sickness in proportion to the time at risk. The third column gives the part of each five-year period that members of each society survived. Sickness events, sickness days, and survival time were of course accumulated only by the living.

Ashborne women consistently initiated more episodes of sickness than their male counterparts in Morcott of the same ages, excluding childbirths.⁵ Whereas the young men of Morcott on average initiated about one new episode in each five-year age group from 20-24 to 45-49, the Ashborne eighteenth-century cohort initiated four times as many new sicknesses, and the 1825-74 cohorts nearly twice as many at the same ages. At higher ages, too, the women experienced more frequent sicknesses than did the men. In all age groups the women accumulated more sick time, which means that their sicknesses also lasted longer. Table 3 contrasts the average length of new sicknesses according to the age at which the episode began, rather than the age at which the sickness was experienced. As expected, sickness length increased with age in all four cohorts of Morcott men and Ashborne women. It also increased over time, comparing eighteenth-century cohorts to the men and women born between 1825 and 1874. Those differences can be summed up by standardizing these results. For Morcott men the average duration rose by 12.9 per cent, and for Ashborne women by 33.1 per cent, a figure pushed up by a few unusually long sicknesses. The standardization is on ages 20-74.

⁴A new event is a sickness that began at least 14 days after the conclusion of a preceding episode. Since there are no conventions for counting new episodes, two options were considered, a minimum option with a 14-day gap, and a maximum option with a 90-day gap. In comparing results it was found that only a few people contracted sicknesses within the period from 14 to 90 days since their last episode, so that the 14-day gap could be adopted as a convention without producing results that differed significantly from using a 90-day gap as a convention.

⁵Some members of the Ashborne society paid additional premiums for childbirth benefits, which are not included in the data examined here.

Table 2
Survivors' health table

	---- Morcott 1725-1799 ----			---- Ashborne 1770-1799 ----		
	Number of sickness events in 5 yrs	Sick time in fractions of the 5 yr period	Survival time within each 5 yrs	Number of sickness events in 5 yrs	Sick time in fractions of the 5 yr period	Survival time within each 5 yrs
20-24	0.77	0.0025	5.0	4.53	0.0971	4.49
25-29	1.33	0.0172	4.92	3.97	0.0800	4.70
30-34	0.96	0.0146	4.90	4.70	0.1181	4.86
35-39	1.31	0.0201	4.83	4.62	0.1536	4.79
40-44	0.97	0.0176	4.78	4.34	0.1546	4.90
45-49	1.16	0.0158	4.86	4.61	0.1611	4.73
50-54	1.50	0.0312	4.82	5.07	0.2137	4.94
55-59	1.43	0.0357	4.74	4.48	0.1700	4.60
60-64	1.90	0.0745	4.61	4.19	0.1684	4.84
65-69	2.22	0.1514	4.58	3.96	0.2426	4.65
70-74	2.77	0.2459	3.85	11.39	0.9151	4.60
75+ a	3.74	0.5391	2.50	0	0.9839	2.50

	---- Morcott 1825-1874 ----			---- Ashborne 1825-1874 ----		
20-24	1.28	0.0142	5.00	0.38	0.0037	5.00
25-29	1.17	0.0230	5.00	2.15	0.0513	4.85
30-34	0.90	0.0247	4.92	1.74	0.0370	4.83
35-39	1.04	0.0186	4.92	1.60	0.0843	5.00
40-44	1.21	0.0173	4.88	1.37	0.0997	4.93
45-49	1.45	0.0329	4.86	1.45	0.1020	4.81
50-54	1.29	0.0394	4.96	1.27	0.0895	4.78
55-59	1.48	0.0740	4.78	1.65	0.0979	4.86
60-64	1.62	0.0657	4.71	1.18	0.1166	5.00
65-69	2.74	0.1489	4.54	1.85	0.2971	4.74
70-74	1.79	0.2524	5.00	4.75	0.8709	4.67
75+ a	0	0.2601	2.50	0	1.0	2.50

^a at the 75+ rate for 75-79

From one cohort to the next the risk of falling sick declined. Both men and women, especially the women, initiated fewer new sicknesses in the 1825-74 cohorts than had the eighteenth-century cohorts. Among Morcott men the average number of sickness days increased slightly from one cohort to the next, while for women it decreased in most age groups. And mortality declined at a similar rate for men and women. These trends can be discerned in Table 2, but they are more readily apparent in the summary measures calculated for standard populations in Table 4.⁶ For men and women the average duration of each

⁶Separate male and female standard populations have been used for Table 4, each composed of the average number of members in the friendly societies for each age group between the two cohorts.

sickness episode increased. That is, the number of sickness incidents declined more sharply for Ashborne females than did the average number of sickness days for each year at risk.

Table 3
Average length in days of new sickness episodes by age of episode initiation

Age group	Morcott <1800	Morcott 1825-74	Ashborne <1800	Ashborne 1825-74
20-24	6.00	16.52	42.22	14.00
25-29	23.36	55.40	41.18	49.82
30-34	27.56	29.78	70.87	40.83
35-39	33.71	38.62	58.87	373.64
40-44	27.32	20.40	125.36	74.56
45-49	24.81	77.88	62.15	68.73
50-54	44.82	32.13	69.55	67.76
55-59	71.36	163.05	76.81	49.77
60-64	134.20	38.0	169.81	97.53
65-69	148.58	101.91	576.59	1590.50
70-74	140.96	161.45	2234.75	2170.00
75+	508.77	0	0	0

Table 4
Average sick time, sickness incidence, and mortality in Morcott and Ashborne societies for cohorts born before 1800 and 1825-74 (standardized by age)

	Born before 1800	Born 1825-74	Per cent change
Morcott males			
Days sick per year	20.2	20.3	+0.4
Net incidents per year	0.29	0.26	-8.4
Deaths per year	24.0 per 1000	15 per 1000	-37.4
Ashborne females			
Days sick per year	89.5	69.2	-22.8
Net incidents per year	0.90	0.32	-64.5
Deaths per year	26.6 per 1000	16.2 per 1000	-39.0

Life and wellness expectations

Table 5 displays life and wellness expectations at three ages in the four cohorts, and shows the percentage change in sick time, well time, and incidence. Men and women alike gained survival time in the passage from the eighteenth century into the nineteenth. They also gained well time. But they gained less well time than they did survival time, the difference showing up in Table 5 as the percentage change in sickness time.⁷ At each age there was a gap between life and wellness expectations in the 1825-74 cohorts as wide as, but in most cases wider than, the gap in the eighteenth-century cohorts. The gains in survival time that these adults enjoyed came in the form of proportionally greater additions to sick than to well time. Indeed, for the women of Ashborne, these wellness expectations show a significant gain only for early age groups, 20-24 to 40-44. For higher age groups well and sick time converged.

⁷This result appears also in comparing survival and wellness time among male members of Scottish friendly societies (Riley 1991). Compare with modern experience in Bebbington (1991).

That convergence is influenced by a provision in the Ashborne rules, which allowed members to draw a pension, in lieu of sick benefits, from age 70. Not everyone took

Table 5
Expected years of life, wellness, and sickness.

Morcott society at ages 25-29 and 50-54			Percentage change in:		
Age and cohort	Expected years of:				
	Life	Wellness	Sickness	Sick time	Well time
From age 25:					
1725-99	36.5	34.6	1.91		
1825-74	42.3	39.6	2.72	42.2	14.4
From age 35					
1725-99	28.9	27.1	1.89		
1825-74	33.4	30.9	2.56	35.2	14.1
From age 50:					
1725-99	19.3	17.3	2.06	25.9	14.3
1825-74	22.3	19.7	2.59		
Ashborne society at ages 25-29 and 50-54			Percentage change in:		
Age and cohort	Expected years of:				
	Life	Wellness	Sickness	Sick time	Well time
From age 25:					
1770-99	34.1	26.6	7.51		
1825-74	40.3	32.8	7.47	-0.6	23.4
From age 35					
1770-99	30.2	22.3	7.98		
1825-74	35.1	27.1	8.02	0.6	21.7
From age 50:					
1770-99	21.3	13.9	7.46		
1825-74	22.9	15.5	7.39	-1.0	11.8

the pension at age 70, but all had taken it by age 75.⁸ However, this strong convergence also shows up when health experience and survival time after age 70 are disregarded. For men the passage of time brought gains in survival and well time. For women those gains were much smaller.

In both communities sickness incidence decreased from one cohort to the next, but among Ashborne women the decline was dramatic. Friendly society members born in Ashborne between 1825 and 1875 were at every age much less likely to fall sick than their counterparts from the earlier cohort. For Ashborne women aggregate sick time declined slightly from one

⁸The higher survival rates of the 1825-74 cohort meant that a larger proportion of members lived to enjoy the pension benefit. Thus in the 1825-74 cohort the sickness rate at ages 70-74 and 75+ was no higher than it was in the eighteenth-century cohort, but the total number of years lived after age 70 was nearly twice as high.

cohort to the next in each age group, while well time increased. But this precipitous drop in sickness incidence meant that the average duration of individual episodes rose. For example, at ages 25-29 sickness duration dropped from 29.2 to 18.7 days a year but, taking incidence into account, the average episode increased in length from 36.7 days to 43.6 days.

Comparing male and female experience, Morcott men lived longer than Ashborne women during their twenties. That female disadvantage shows up in Table 5 for age 25. At ages 30 and above, however, women had the advantage. But the women's wellness expectations fell even more decisively below the men's expectations in both cohorts. Even though the calculations behind Table 5 exclude time lost from work because of childbirth, Ashborne women show decidedly higher quantities of sickness time during adulthood. That difference was greater during childbearing years. But it was still marked at higher ages.

Other evidence from the nineteenth century shows higher life expectancy and higher sick time for women than men.⁹ The contrast evident in Tables 5 and 2 may be owing in part to differences in the characteristics of the two communities under observation as well as to differences associated with sex. Ashborne with the adjacent town of Compton must be counted an urban area, and therefore a region facing higher risks of death and disease than rural Morcott. Furthermore, the Ashborne Female Friendly Society was supported in part by honorary members, benefactors who contributed annually to the society's expenses without entering any claims. On average the honorary members, who may have been the employers of benefit members, contributed nearly half of the society's revenues, leaving out income from investments. The effect of this practice was to allow the Ashborne society's benefit members to draw more generous benefits than warranted by their own contributions, while the Morcott men drew benefits only from their own contributions. In the middle of the nineteenth century Ashborne benefit members paid a weekly average of 1.09d for weekly benefits of 4s, while the Morcott men paid a weekly average of 2.8d for weekly benefits of 7s. Thus the Ashborne society offered its members a higher benefit-premium ratio, at 44:1, than did the Morcott society, at 30.3:1, and that higher ratio may have induced more or longer claims. In sum, Ashborne's urban status probably explains the higher mortality of its members, compared to Morcott men, while the more generous benefits that the Ashborne society paid, in proportion to premiums, probably added to the male-female differences noticed in sickness. But the basic differences apparent in that comparison, a higher female life expectancy combined with a lower wellness expectation, are consistent with other evidence. In twentieth-century populations as well, women report more episodes of sickness and their sicknesses last longer than do those of males. But the women's sicknesses are less likely to result in death (Waldron 1982; Verbrugge 1989).

The comparisons of well and survival time and of health experience embodied in Tables 2, 4, and 5 underscore the value of looking for signs of change in mortality and health experience across the health transition. They suggest that the most dramatic feature of the health transition was movement across regimes. But the issue of whether change is a leading element of the story can also be approached in new ways.

Does earlier health experience predict later health?

Almost uniquely among the records that can be assembled about health experience in historical and contemporary populations, friendly society ledgers make it possible to follow wellness and sickness across the adult life course of an individual. They show how often people fell sick, according to friendly society rules for distinguishing sickness from wellness.

⁹The largest volume of aggregate data about sickness among women who belonged to friendly societies appears in Sutton (1896). See also Riley (1989).

And they show how long sickness episodes lasted. Thus these records make it possible to formulate questions about the predictive power of sickness and wellness earlier in life.

In order to test the hypothesis that change dominated the health transition, the Morcott men and Ashborne women have once again been divided into cohorts born in the eighteenth century and cohorts born in the years 1825-74. In each group of cohorts members have been allocated to successive reference age groups: 25-34, 35-44, 45-54, and sometimes 55-64. Within each of those groups members have been sorted into three categories, those who were **well**; those in the bottom half of sickness rates, the **low** category; and those in the top half of sickness rates, the **high** category. The members of each category have been followed forward in time through successive quinquennial age groups up to old age in an effort to discover how long people in that category maintained the position they occupied at the reference age.

Figure 1 provides an illustrative model for the series of findings presented in Figures 2-5. This model relates the predictive power of sick time at ages 25-34 for future sick time among the Morcott men born in the period 1725-99. Two issues are of concern: do the members of each group distinguish themselves from other groups beyond the reference age? And if they do so, then for how long? In Figure 3 Morcott men who were always well at ages 25-34 continued to experience less sick time than members of the low and high sickness groups through three successive age groups, 35-39 to 45-49, before crossing the curves described by sick time in those groups. And men who fell into the low sickness group at ages 25-34 continued to experience less sickness than the high group through ages 40-44. The most important thing to look for in Figures 2-5 is the age at which the sickness curve of the well group crosses the curves of the low and high sickness groups.

Figures 2-5 present the full series of results for all four cohorts. They show the predictive power of past health experience in separate A and B series. In the A series, sick time in each age group predicts sick time in successive age groups from each reference age. In the B series, sick time predicts the net incidence of sickness at future ages.

Figures in the 2a series show how long adherence to the well, low, or high category obtained for Morcott men born in the eighteenth century. They show that wellness at ages 25-34 forecast lower sick time for the next three quinquennial age groups, to 45-49. Wellness at ages 35-44 failed to predict a future health experience much different from the low sick time group, although it did predict future sick time lower than that in the high group for some 20 years. At ages 45-54 and 55-64 wellness once again predicted three successive quinquennia of lower sick time. Overall, wellness in the reference ages reliably predicted significantly fewer sickness days for 15 to 20 years, before the three groups converged. Likewise membership in the low and high categories predicted future sick time for about the same period of 15 to 20 years.

One of the strong reasons for convergence after 15 to 20 years lay with the deaths of members within a category, especially at the upper end of the high group. Many of the men who were sick much of the time died, which removed them from the category and pushed sickness rates down, especially at lower reference ages.

Results in the B series for Morcott men born in the eighteenth century are more distinctive still. Men who were well during each reference period enjoyed a consistently and significantly lower rate of new sickness events at all subsequent ages. Men who fell into either category of the sick, low or high, tended to remain in that category for 15 to 20 years, when the low and high categories converged.

The A and B series in Figure 3 take up the same issues for Ashborne women born in the eighteenth century for three reference ages, 25-34, 35-44, and 45-54. Whereas among the men the well group included larger numbers of men than either the low or high categories, among Ashborne women it made up the smallest number. In the 25-34 reference age, the well group disappeared after ages 45-49, as its members all left or died. That notwithstanding, health

experience in the reference age shows an even stronger power to predict future health among Ashborne women than among Morcott men. The well preserved a distinctively superior position in future sick time up to the pension age of 70; they also retained a lower risk of initiating new sickness events.

Figures 4 and 5 show similar characteristics in the Morcott and Ashborne cohorts born during 1825-74. In each case sick time in the reference age predicted sick time at later ages for several quinquennia, longer for women than for men. And in each case wellness in the reference age forecast a future of markedly fewer sickness events than that faced by either the low or high group of the sick.

Figure 1 Morcott, 1725-99 cohorts 25-34, Sick time predicts time

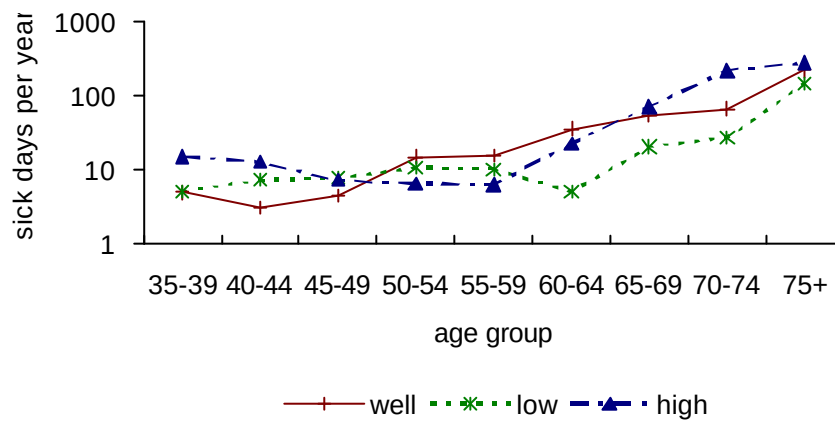


Figure 2a1 Morcott, 1725-99 cohorts 25-34, Sick time predicts time

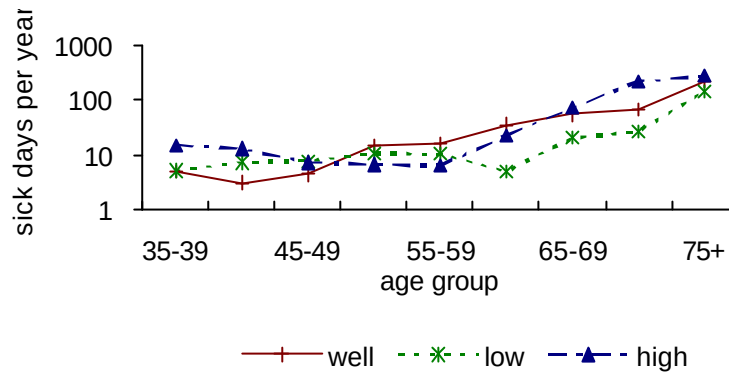


Figure 2a2 Morcott, 1725-99 cohorts 35-44, Sick time predicts time

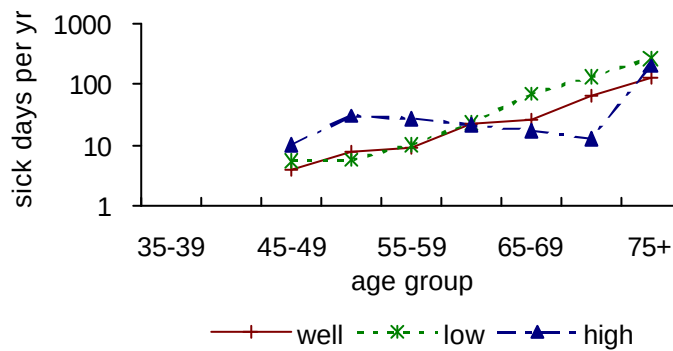


Figure 2a3 Morcott, 1725-99 cohorts 45-54, Sick time predicts time

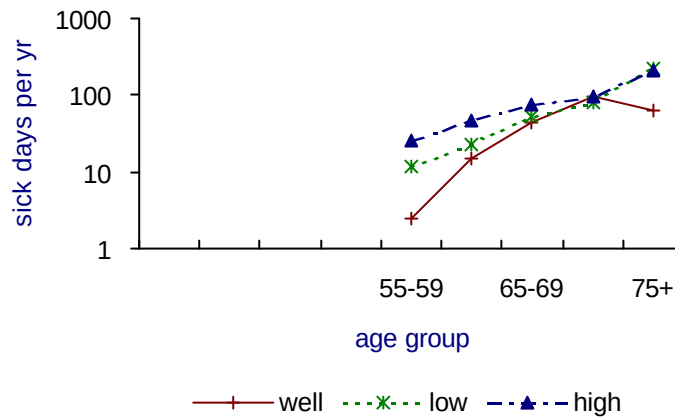


Figure 2a4 Morcott, 1725-99 cohorts 55-64, Sick time predicts time

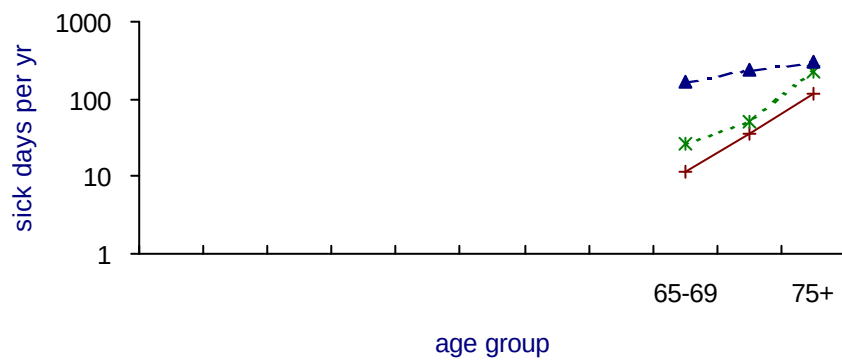


Figure 2b1 Morcott, 1725-99 cohorts 25-34, Sick time predicts net incidence

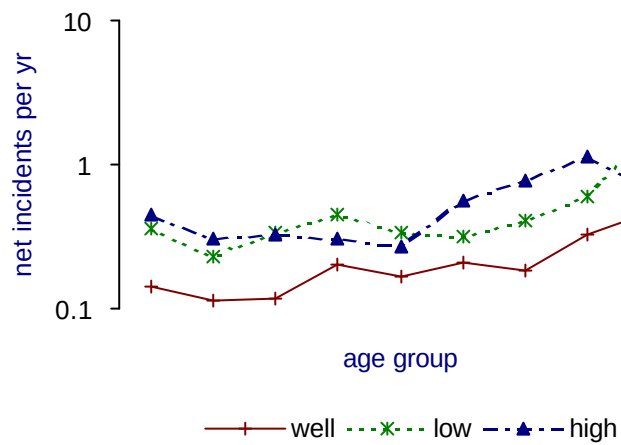


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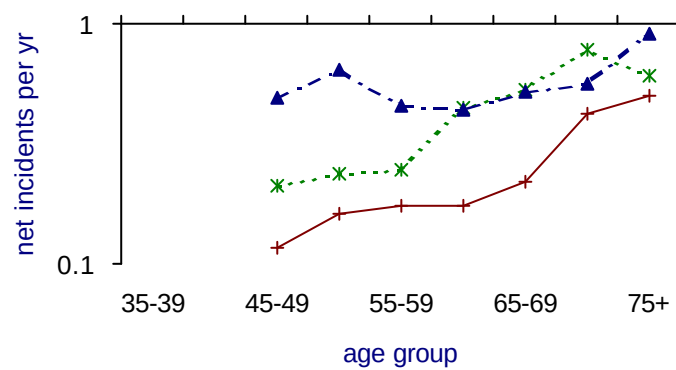


Figure 2b3 Morcott, 1725-99 cohorts 45-54, Sick time predicts net incidence

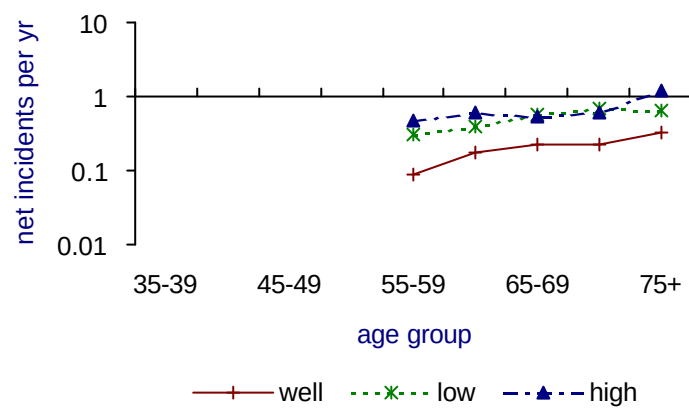


Figure 2b4 Morcott, 1725-99 cohorts 55-64, Sick time predicts net incidence

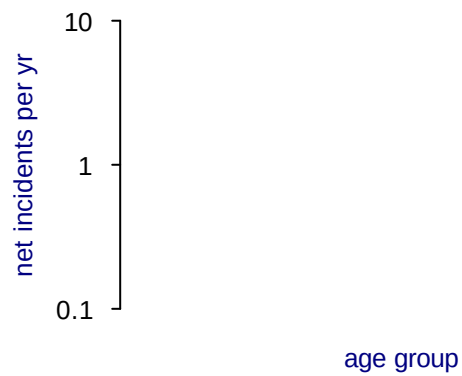


Figure 3a1 Ashborne, 1770-99 cohorts 25-34, Sick time predicts time

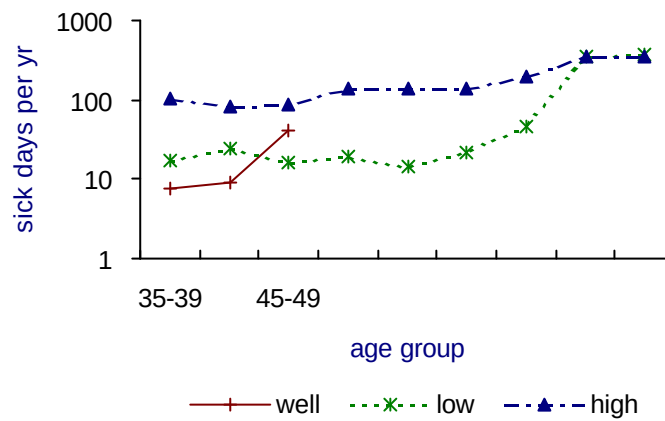


Figure 3a2 Ashborne, 1770-99 cohorts 35-44, Sick time predicts time

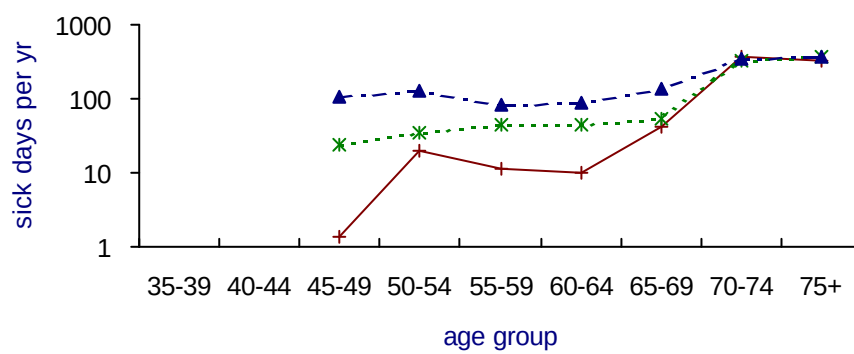


Figure 3a3 Ashborne, 1770-99 cohorts 45-54, Sick time predicts time

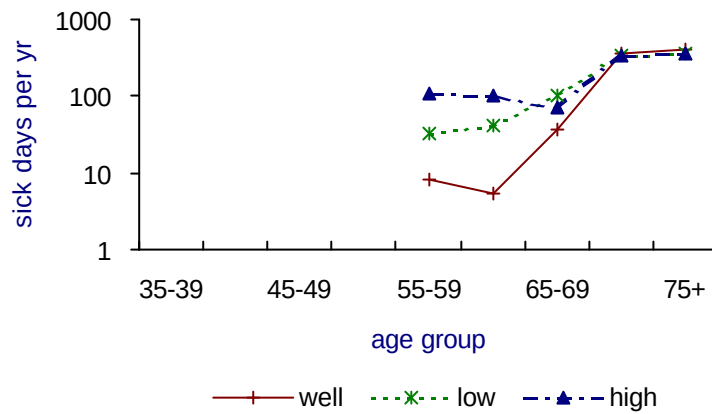


Figure 3b1 Ashborne, 1770-99 cohorts 25-34, Sick time predicts net incidence

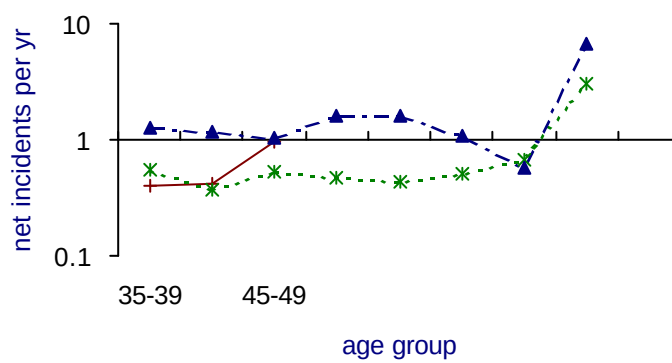


Figure 3b2 Ashborne, 1770-99 cohorts 35-44, Sick time predicts net incidence

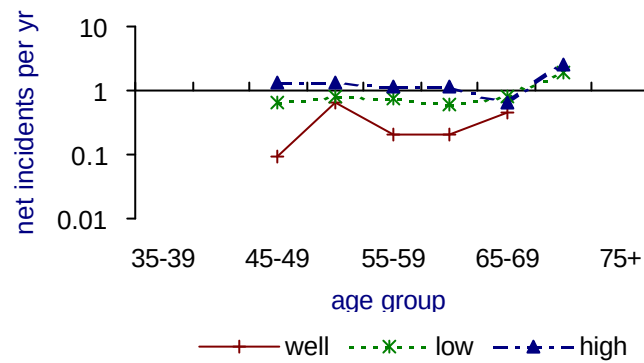


Figure 3b3 Ashborne, 1770-99 cohorts 45-54, Sick time predicts net incidence

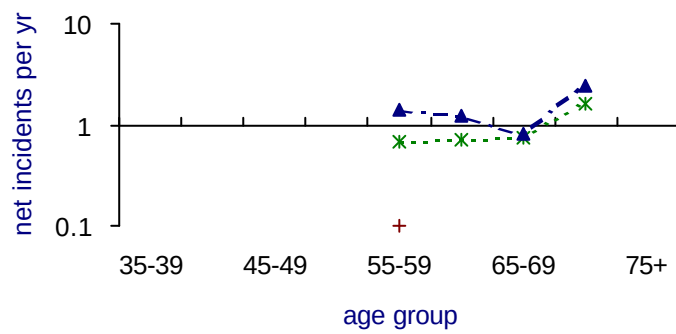


Figure 4a1 Morcott, 1825-74 cohorts 25-34, Sick time predicts time

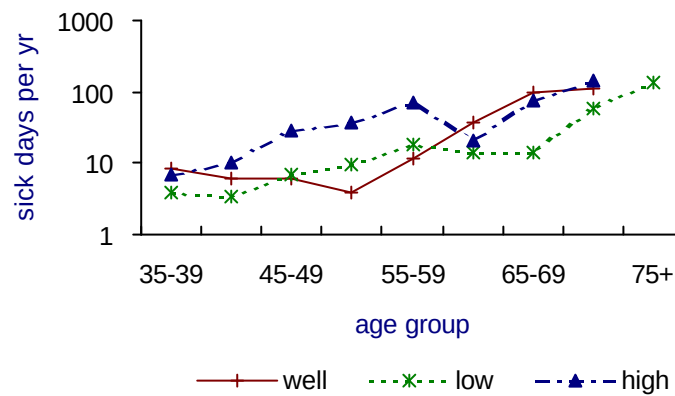


Figure 4a2 Morcott, 1825-74 cohorts 35-44, Sick time predicts time

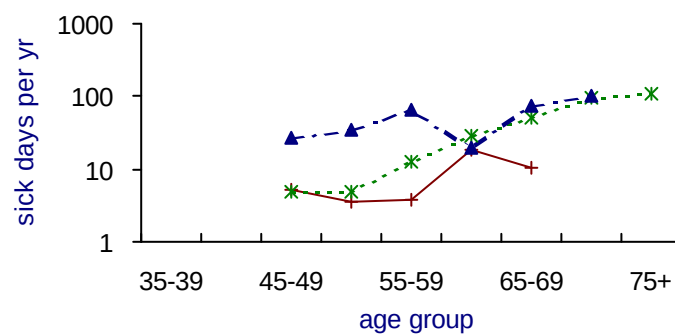


Figure 4a3 Morcott, 1825-74 cohorts 45-54, Sick time predicts time

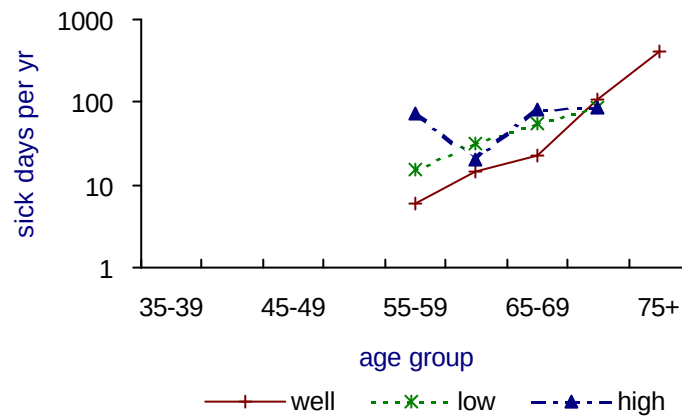


Figure 4a4 Morcott, 1825-74 cohorts 55-64, Sick time predicts time

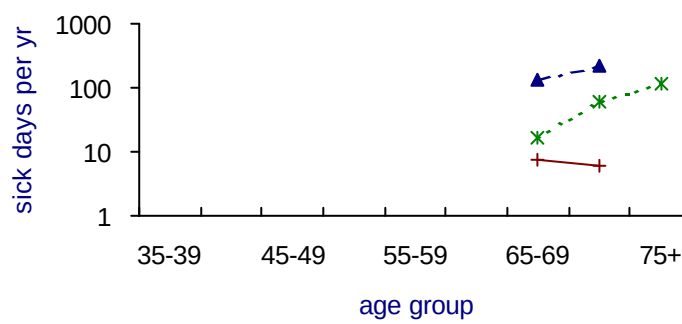


Figure 4b1 Morcott, 1825-74 cohorts 25-34, Sick time predicts net incidence

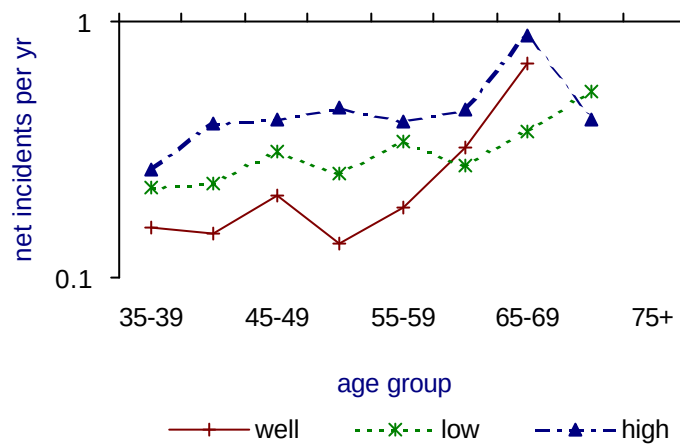


Figure 4b2 Morcott, 1825-74 cohorts 35-44, Sick time predicts net incidence

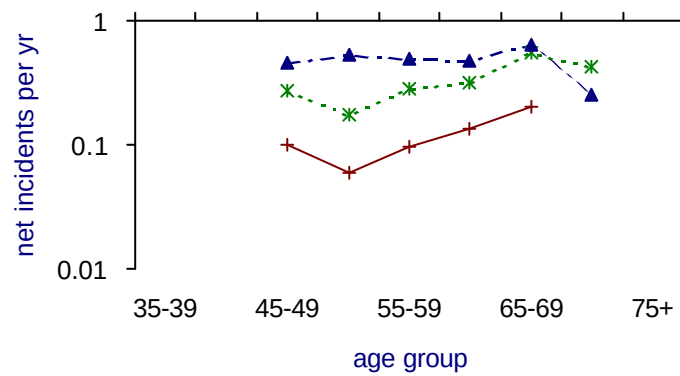


Figure 4b3 Morcott, 1825-74 cohorts 45-54, Sick time predicts net incidence

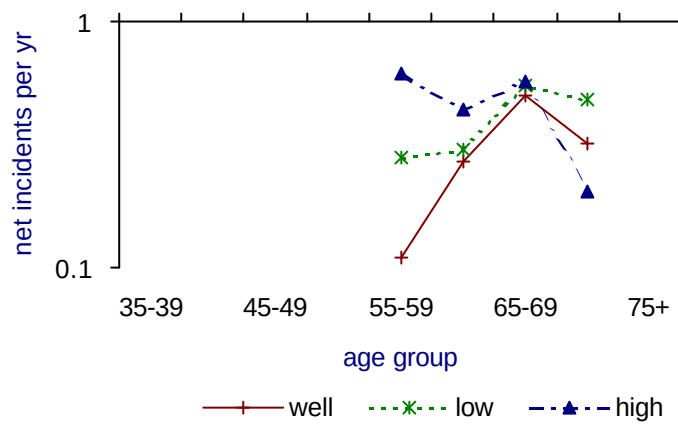


Figure 4b4 Morcott, 1825-74 cohorts 55-64, Sick time predicts net incidence

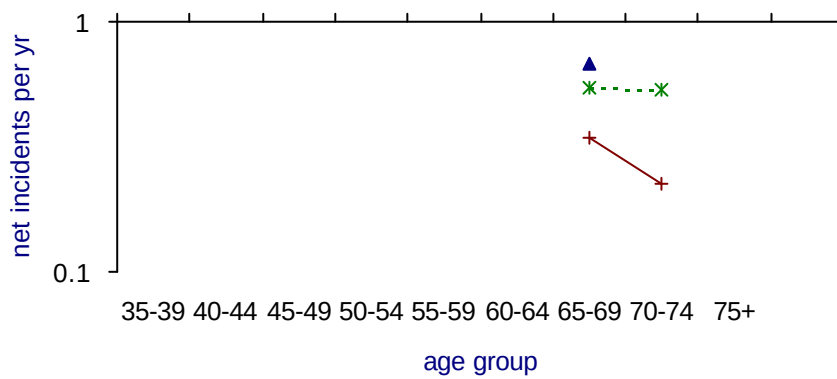


Figure 5a1 Ashborne, 1825-74 cohorts 25-34, Sick time predicts time

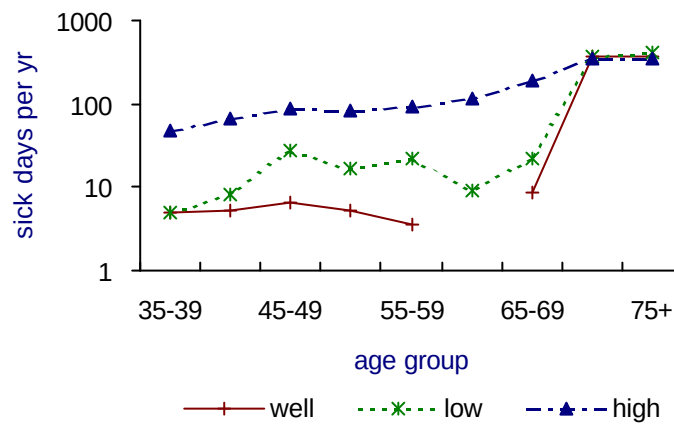


Figure 5a2 Ashborne, 1825-74 cohorts 35-44, Sick time predicts time

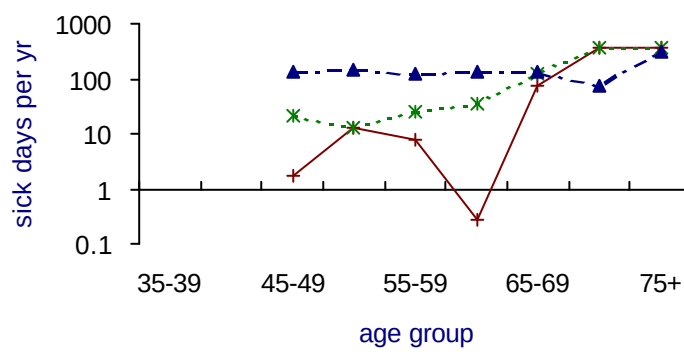


Figure 5a3 Ashborne, 1825-74 cohorts 45-54, Sick time predicts time

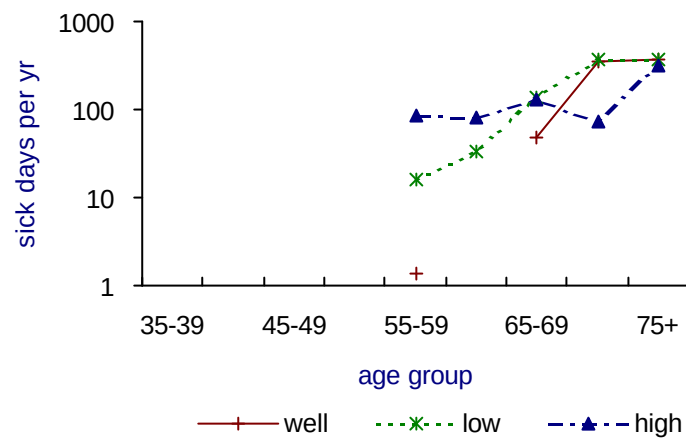


Figure 5b1 Ashborne, 1825-74 cohorts 25-34, Sick time predicts net incidence

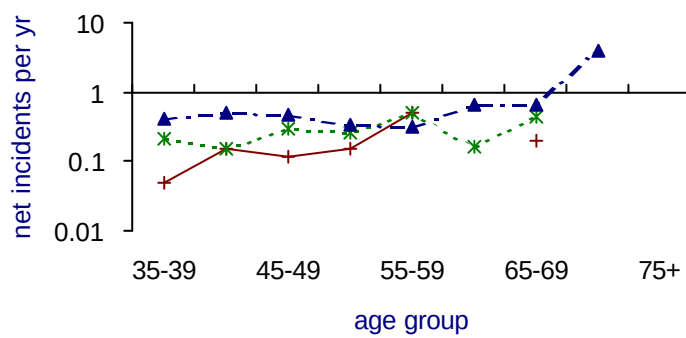


Figure 5b2 Ashborne, 1825-74 cohorts 35-44, Sick time predicts net incidence

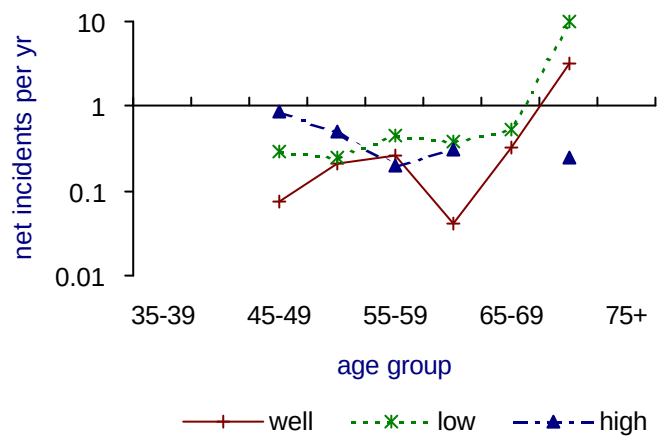
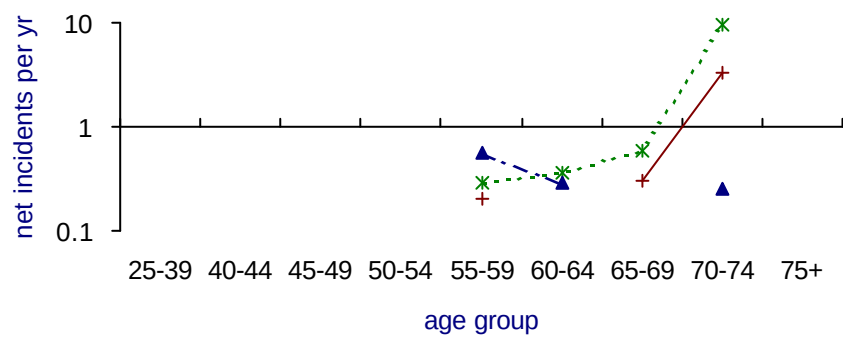


Figure 5b3 Ashborne, 1825-74 cohorts 45-54, Sick time predicts net incidence



Taken together, Figures 2-5 suggest the following interpretations. (1) Current health experience successfully predicted future health for 15 years or more. (2) Current health predicted future health more effectively and longer for sickness events than for sick time. (3) These populations entered adulthood already differentiated in their current health experience, and that differentiation persisted over time. The first signs of weakness in differentiation typically appear when sick time or net incidence in the high category converges toward the low category as its sickest members died, rather than because its members gained a better health status.

(4) The patterns that are apparent in cohorts born in the eighteenth century remained in place among cohorts born in the years 1825-1874. The passage of time and the health transition depicted in the life and wellness expectations sketched in Tables 4 and 5 did not bring a structural change in the relationship of prior to subsequent health experience. Men and women alike joined categories of the sick and the well, or of the often sick rather than the infrequently sick, by early adulthood, and tended to retain those positions as they aged, despite major changes in the health environment. The persistence of these patterns across time suggests that whatever environmental forces influenced both the exposure to sickness and the duration of sickness episodes were already in place in early adulthood, and perhaps sooner. These findings do not rule out the claim that biological forces played a larger role than environmental forces in determining health status. They do seem to rule out any claim that changing environmental circumstances played a larger role than the spectrum of environmental and biological forces in effect in early adulthood.

(5) Finally, Figures 2-5 suggest another form of male-female differences in health experience. Men and women alike appear to occupy positions in a hierarchy of health states and to remain in those positions. But women appear to persist in their health states longer than do men. That tendency is especially noticeable in these figures by the lesser likelihood of convergence between the low and high sickness groups among women than among men, regardless of whether the prediction concerns future sick time or future sickness incidence. Among the Ashborne women more often than among the Morcott men, the three categories remain separate.

Conclusion

In individual experience change and stability alike characterized the health transition. Evidence from the men and women who belonged to the Morcott and Ashborne friendly societies suggests two changes of importance, and one continuing feature. First, the risk of initiating a new sickness episode declined between cohorts born in the eighteenth century and those born in the period 1825-1874, for men and women alike. But the average duration of each sickness increased. Hence, in the second change, survival time rose more sharply than did well time. Health improved, in that people lived longer and experienced fewer episodes of disease and injury. But it did not improve in the average duration of sickness episodes or in the proportion of adult life spent in sickness as opposed to wellness.

Shifting attention from sickness and survival rates to health experience across the adult life course, the men and women of Morcott and Ashborne show continuity rather than change. In the eighteenth-century cohorts wellness earlier in adult life reliably predicted a future of wellness, and sickness predicted sickness. Sickness at earlier ages typically predicted a distinctive future of sick time for 15 to 20 years, and it predicted a distinctive future risk of initiating a new sickness for an even longer period. Those patterns remained in place among cohorts born in the years 1825-1874. In those terms sickness experience does not appear to have been random. Instead, for eighteenth-century cohorts who presumably died chiefly from

infectious diseases and for mid-nineteenth-century cohorts who died principally from respiratory diseases, health experience seems to have been determined to a significant degree by individual characteristics present by early adulthood. Even though the environmental and epidemiological regimes of mortality and morbidity changed in notable ways across the years lived by members of those two cohorts, these men and women continued to assume hierarchical positions of wellness and sickness by early adult life and to retain those positions as they aged.

In addition to these direct implications, the evidence surveyed here suggests some indirect implications. Most of the morbidity and also the mortality risk among the Morcott men and the Ashborne women was concentrated in a subgroup of people who entered adulthood already in bad health and who for the most part preserved that status until their deaths. From this it follows that efforts to reduce adult morbidity and mortality in those populations could have been directed chiefly toward people who had been sick, insofar at least as the factors causing sickness and death in that subgroup could be isolated from factors affecting the entire population.

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The family and demographic change in Sri Lanka



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Abstract

Sri Lanka has almost completed the demographic transition with low mortality rates and fertility rates approaching replacement levels. Sri Lanka shares these characteristics with the South Indian states of Kerala and Tamil Nadu in contrast to elsewhere in South Asia where mortality and especially fertility rates remain much higher. A key part of the explanation for these differences lies in the nature of the family.

The Sri Lankan family is essentially the conjugal unit of husband, wife and dependent children whereas in northern South Asia agnatic relations between son and parents are central to family structure. Related to this family system the position of women in Sri Lankan society was relatively high in South Asian terms. Consequently women had a strong say in health and fertility behaviour. When required, for example, mothers take the initiative in seeking health care for themselves and their children. Importantly family structure has facilitated female education which is associated with both mortality and fertility decline. There are few concerns that the values imparted by secular education are contrary to the values of the family or to women's roles within it. The egalitarian family structure has also contributed to fertility decline by raising the costs of children and reducing the long-run benefits to be gained from them.

Sri Lanka is particularly distinctive in the contribution of changes in female age at marriage to its fertility decline, marriage age having risen six years this century. This change has been accompanied in recent times by a shift from family-arranged to self-selected (love) marriage. The explanation lies in changes in the socio-economic system which have reduced the centrality of the family in wider social and economic relations, and placed a greater premium on an individual's own abilities and attributes.

This paper examines the contribution of sociological factors to demographic change in Sri Lanka. It focuses on changes within the family and their impact on mortality and fertility.

Asia in the last few decades has been marked by a demographic transition comparable to but much more rapid than that which occurred in Western nations in the nineteenth century. A continuing mortality decline has been followed in the last few years by a widespread fertility decline, which has gone furthest in East Asia, but which has also resulted in dramatic declines in fertility in South and Southeast Asia.

While in some countries, particularly in East Asia, these demographic changes have accompanied dramatic economic progress, in others they have occurred despite much poorer growth, and without many of the attributes that have been cited to explain the earlier demographic transition.

A particularly interesting example of the demographic transition has been that of Sri Lanka. Sri Lanka is characterized by a demographic regime typical of a country nearing the end of the demographic transition yet its economic development as measured by its per capita income is typical of countries where the demographic transition is only just commencing.

Sri Lanka is of particular interest in the context of its own South Asian region where among the nations it has much the lowest mortality and fertility rates. The picture, however, is somewhat more complicated when variations within countries, especially India, are taken into account. South Asia is marked by two very different demographic regimes. In the north, in Pakistan, Bangladesh, Nepal and the Indo-Gangetic Plain of North India, death rates though falling remain much higher than in the South. Similarly birth rates have remained much higher in the north, having only recently begun to fall in many parts of North India and Bangladesh, and having yet to do so in Pakistan and Nepal. In contrast in the South birth rates have fallen dramatically, and in Kerala, Goa and Tamil Nadu in India, as well as in Sri Lanka, birth rates are approaching or are even below replacement.

There is strong evidence that the explanation for these two demographic regimes is, in large part, linked to differences in family structure (Dyson and Moore 1983; Caldwell 1992). This paper will explore how differences in family structure have influenced the demographic regime.

Sri Lanka's demographic transition

Before World War II Sri Lanka's demographic characteristics were not particularly distinctive. Its birth rate was little different from those of countries in South Asia, while its death rate was above that of the neighbouring Madras Presidency, though below that of the northern reaches of the subcontinent (Langford and Storey 1993:268-270). Following World War II, however, there was a dramatic decline in mortality. A crude death rate of 21.5 in 1945 was halved by 1955 to 11.0 per thousand. Life expectancy increased from 42.2 years in 1946 to 58.2 years in 1953, an increase of 16 years in only seven years. Life expectancy has continued to improve at a slower but steady pace. By 1991 another 14 years had been added with the Sri Lankan life expectancy achieving an average of 72.5 years, a figure only marginally below that of the developed world.

There were equally dramatic declines in infant and maternal mortality. In 1945 the infant mortality rate (IMR) was recorded as 140 per thousand. By 1950 the IMR had fallen to 82, a decline which continued until by 1990 it was under 20. The decline in maternal mortality was especially dramatic from a recorded 1,650 per 100,000 live births in 1945 to 560 in 1950 and 50 in 1985. This helps to explain why life expectancy for women has gone from being less than that of men to being greater (see Langford and Storey 1993). The consequence of this decline in the mortality rate was a near-doubling in population growth to just under three per cent per annum.

Fertility rates began to decline from the early 1950s following the mortality decline and have continued to fall until the present day. Sri Lanka's fertility rate now only marginally exceeds long-term replacement, and is anticipated to fall below in the near future. In this Sri Lanka's experience contrasts with that of most of South Asia, but is parallel to the neighbouring South Indian states of Kerala and Tamil Nadu.

Where Sri Lanka's experience is distinctive is the contribution of changes in marriage patterns, particularly delayed female marriage, to declining fertility, a phenomenon that led Kirk (1969:80-81) to refer to Sri Lanka as the Ireland of Asia. Singulate mean age at marriage (SMAM) among Sri Lankan women has increased from approximately 18 years in the 1901 census to over 24 years in the 1981 census (the last census undertaken in Sri

Lanka). Given that SMAM is recording the average age of all married women in the population, and not those currently marrying, the latter figure is understating the true position. For South Asia, and indeed, for many other developing countries these are remarkable figures. Even the 1901 figure is later than is the situation of much of contemporary South Asia, not to say the situation prevailing then when child marriage was often the norm. The 1981 figure is well above that occurring anywhere else in South Asia, including such states as Kerala, with which otherwise Sri Lanka shares much in common, socially and demographically.

Wright (1968:745-756) estimated that almost the entire decline in fertility up to 1963 was due to a rise in the female marriage age. Fernando (1972:447) similarly attributed four-fifths of the fertility decline between 1963 and 1969 to the rising female marriage age. Slightly more conservatively Alam and Cleland's (1981) analysis of the 1975 Sri Lanka Fertility Survey (SLWFS) attributed 59 per cent of the fall in fertility—from a total fertility rate (TFR) of 5.3 in 1963 to 3.5 in 1974—to changes in marriage. More recently a continuing fertility decline has been driven by declines in marital fertility.

In sum the Sri Lankan fertility decline would appear to be a classic demographic transition. However, in contrast to a number of other Asian countries it has occurred in the absence of remarkable economic growth, and at a comparatively low per capita income. To what then can these demographic changes be attributed?

Causes of demographic change in Sri Lanka

A critical factor for mortality decline has undoubtedly been an extremely efficient and effective public health system, and for fertility decline a strong family planning program. Public health measures date back to the middle of the nineteenth century with quarantine measures against diseases such as cholera. Early this century there were major campaigns to control hookworm and diarrhoea, with dramatic effects on those areas on which they were targeted, the towns and the plantation estates. The dramatic mortality declines of the post-World War II period were arguably the consequence of the combination of major public health campaigns, notably against malaria, and the establishment of a comprehensive health system with clinics down to the village level. The precise importance of the malaria campaign as against the general improvement in health services and overall economic improvement, however, has been the subject of a long debate (Collumbine 1950; Sarkar 1957; Frederiksen 1961; Newman 1965; Meegama 1967; Abeyesundera 1976).

It is no coincidence that this was the period following independence in 1948. The new governments, in response to the demands of their electorate, placed major emphasis on health services, as well as on other social services such as education. Significantly the electorate from the beginning was universal and included women who were recognized to place particular emphasis on the provision of health services.

Similarly while the early fall in fertility was a consequence of changes in marriage patterns, the continuing fall was due to declines in marital fertility which greatly accelerated following the establishment in 1966 of a well funded and implemented national family planning program.

Clearly popular acceptance of any service depends on its demonstrated effectiveness, the convenience of the service, as well as on whether the service meets a conscious need. In this the Sri Lankan health service and later the family planning service have undoubtedly been able to demonstrate their utility.

Nevertheless, while the establishment of a national system of family planning and health services has been instrumental in the declines in fertility and especially mortality, they have not been sufficient. With particular reference to fertility, the contribution of

changes in age at marriage to fertility decline has already been noted. Even the decline in marital fertility is partly due to the use of non-contracepting methods such as rhythm. More generally, though, even where new facilities have been essential as in the mortality decline, the success of the services depends on popular acceptance and the use made of the services.

The Sri Lankan Demographic Transition Project

The origins and causes of Sri Lanka's mortality and fertility declines were explored by the Sri Lanka Demographic Transition Project (SLDTP). The SLDTP was conducted in seven sites in coastal Sri Lanka in 1985 and one site, a tea estate in the hills above Kandy in central Sri Lanka, in 1987. The coastal sites included two villages, Bondupitiya, in Kalutara District to the south of Colombo, and Loluwagoda, northeast of Colombo, in Gampaha District; an urban poor area, Maligawatta, and Jumma Masjid Road, a marginally better-off neighbourhood bordering it; New Kelani Bridge, a squatter area; Nugegoda, a middle-class area; and Welisara, a commuting area just outside Colombo. The sites represented, in socio-economic status, locality type and ethnicity, a broad cross-section of Sri Lanka's population mix, and particularly that of the demographically progressive Western Province. The two villages and the middle-class area were predominantly Buddhist Sinhalese. One village, Bondupitiya, was mixed-caste with a high proportion of a low caste; the other, Loluwagoda, was predominantly high-caste Govigama. The commuting area Welisara was also mostly Sinhalese but had a high proportion of Christians, mostly Catholic. Maligawatta and Jumma Masjid Road were predominantly Muslim, while New Kelani Bridge was a mixed area with both Sinhalese and Tamils. The tea estate site (Rahatungoda), surveyed in 1987, in population consisted predominantly of the descendants of Tamil immigrants from India recruited in the nineteenth and early twentieth centuries by British plantation owners. A minority of this population was Sinhalese.

The SLDTP was a joint collaboration between the Demography Program of the Australian National University and the Demographic Training and Research Unit of the University of Colombo. The Project involved a combination of a structured survey and extensive in-depth interviews.

A range of issues were explored including health and health behaviour, fertility and marriage. As the project progressed new issues arose out of the in-depth interviews, and new questions were added to the structured survey. An additional survey was added in the last three areas interviewed, for older women who in their own lifetimes had experienced many of the changes that the project was investigating.

The survey covered three major demographic and social events, the mortality decline, the decline in marital fertility and the rise in age at marriage for women. I will first examine findings common to all three and then examine each individually.

The respondents in the survey of the older women were well aware that important changes had taken place in births, deaths and marriages in their lifetimes. They identified as critical the role of government services particularly in improving health but also in promoting family planning. However, they also emphasized the importance of behavioural factors in bringing about the change. The change is attributed to a variety of factors including government information, education, and general economic and social changes in society. Understandably the older women placed less emphasis on changes within the family for such changes were less striking, but they did recognize their importance.

The older women were asked a number of questions relating to health care. In response to a question on what they perceived to be the primary factor, by far the most common answer in all three areas where it was asked, was better health facilities. Estate respondents also emphasized the readiness of young mothers to seek treatment. The fact that this last

answer was primarily found in the estate seems surprising given that health statistics are poorer on the estates, hygiene is poor and in-depth interviews indicated less use of modern medical facilities and in general less emphasis on health-seeking behaviour. A sign of this was that whereas virtually all pregnant women in the Western province sites received prenatal treatment and gave birth in hospital this was true of only a minority of estate women. The answer may, however, reflect a continuing inadequacy in health facilities compared to the other survey areas. While the estate had a doctor as well as a government midwife, their contribution to improved health appeared more limited than that of their counterparts in the other survey areas. The doctor appeared to have only limited medical training while the midwife who was Sinhalese was unable to talk to most estate women who spoke only Tamil, and indeed did not attempt to visit most households as was done in other areas. Quality health care required visiting the local hospital located about 20 kilometres away by bus.

More importantly though the answer is quite pertinent. Mothers in the Western Province have long been interested in seeking health treatment for their children and able to take the initiative in doing so. What has changed is that the health treatment they are increasingly seeking is that provided by modern health facilities rather than the indigenous Ayurvedic medicine. In contrast in the estate young mothers were expected to leave the initiative on seeking treatment for themselves and their families to their husbands and their mothers-in-law. There is some evidence from the survey that this has changed to some degree. Nevertheless, as will be noted below, female autonomy in regard to health as well as many other matters remains much lower in the estates, especially amongst the estate Tamil population.

Table 1
Older women's reasons for changes in child health care

Reasons	Residence		
	Welisara	Loluwagoda	Rahatungoda
People's knowledge on health matters has improved	24.1	25.5	15.3
High medical standard	16.5	16.7	20.3
Parents are interested in child health	12.7	23.5	8.5
Mothers are working	16.5	7.8	10.2
Children today need more care	2.5	1.0	13.6
Breastfeeding declined	0.0	2.0	10.2
Economic and social problems	1.3	2.9	1.7
Families are smaller today	3.8	3.9	-
Anxiety about social ills	5.1	0.0	-
Modern society	3.8	3.0	-
Immunization available	-	-	5.1
Enough food available	-	-	3.4
Do not know	6.3	2.0	3.4
No response	7.6	11.8	8.5
Total	100.0	100.0	100.0
N=	79	102	59

Source: Primary analysis of Sri Lankan Demographic Change Project data, 1985-87.

The older respondents were also asked about changes in child health care. As Table 1 shows, most accepted that changes in health care behaviour had made an important contribution to better child health though a number indicated what they perceived to be the negative effect of women working in the labour force. Two of the three most common responses concerning changes in health behaviour were that parents' knowledge on child health had increased and that parents were interested in child health.

In-depth interviews brought out a number of very interesting and perceptive responses as to what the respondents believed had changed. They emphasized the effect of the new health services, but also of education, women's work, and women's autonomy. Agdahamy emphasized the impact of the new health services:

When I was young there were not many health facilities. So we looked after the health of our children by treating with home medicines. We did not care about doctor's treatment, but nowadays parents like to take hospital medicine straightaway. In the old days when a child got a normal illness parents did not care about it. But now even if it is minor or not they take immediate treatment.

Other respondents emphasized the ancillary contribution of education. Pinchi Nona commented:

Nowadays mothers are educated and they have a good knowledge about health and looking after the children. They learn about good hygiene and they get advice from health clinics and books. In the past women didn't know much and knew only what their parents said.

Yet it is too simple to say that Sri Lankans now know better, that in some sense education has taught them the value of modern medicine. While it is true that education has provided useful information on cleanliness and healthy behaviour, it has not impressed the principles of Western medicine on Sri Lankans. It was clear from interviews that most Sri Lankans, including the educated, adhered to the principles of Ayurvedic medicine according to which disease is the result of a breakdown in the natural balance of the bodily humours. Western medicine is used not because it is perceived to be the only way to cure the illness but it is recognized as rapid and generally efficacious. Nevertheless the respondents universally felt that only Ayurvedic medicine addressed the root cause of ill-health by restoring to the body the correct balance that was responsible for good health. This meant that it was regarded as particularly suited to chronic illnesses. For illnesses where a quick cure was essential Western medicine for the symptoms was often combined with Ayurvedic medicine to treat the disease.

Nevertheless, even though the educated shared with the less educated a common acceptance of Ayurvedic principles they were more likely to use Western medicine. One reason for this is that the educated have stronger reasons for desiring Western medicine and the quick cures it is believed to bring about: the educated are more likely to have jobs, often in towns, that prevent them from providing the care necessary for Ayurvedic medicine or from gathering and preparing the essential herbs. However, the respondents indicated that there was more to it than just this. The educated are more self-confident and as a consequence are more willing to adopt innovative behaviour and to act contrary to traditional beliefs. They have a greater self-assurance in dealing with health staff and receive greater respect in return. Perhaps most importantly, the educated, especially educated women, are more willing to take the initiative in health care decision-making and are shown more respect in return. The increase in women's autonomy as a factor contributing to changing health behaviour is well expressed by Agnes:

Nowadays, mothers look after the health of their children well because they can understand about health matters. They feel they can control their own lives and that of their children. It has been helped by the new health facilities.

Kawamma also emphasized an increasing willingness to take the initiative in seeking health treatment, and indeed societal expectation that they will take it:

Compared with the past children are now better clothed and well fed. Once only large [older] children were taken to hospital when sick; they tried to help infants with home remedies and went no further. Now even infants are rushed to hospital. Now if we give only home medicines and the infant dies, there will be an inquiry. The police will arrive and rush even very young children to hospital. Secondly, they have largely forgotten how to make the home medicines and there are no longer Ayurvedic doctors to teach them. Thirdly, women's wages are so important that they don't want the risk of looking after a kid with a chronic condition; they want a quick cure. Furthermore, an increasing number of women will take their kids to the doctor without waiting for their husbands.

There are a series of important points here. Community and particularly state attitudes have changed. Public health facilities are provided and there is an expectation that they will be used. With education, town jobs and the general process of urbanization, people are becoming cut off from their traditional roots and are losing touch with how to prepare the herbs required for Ayurvedic medicine. Interestingly there is a developing market for ready-prepared Ayurvedic medicines on the model of Western medicines. The identification of Western medicine with quick, if not always complete, cures has been noted above. This respondent's final point which she refers to almost as an afterthought is the one I believe the most important: that is, the increasing tendency of women to take their children to clinics without waiting for the permission of their husbands or anyone else.

The reasons for this change are clearly complex. As Kawamma's statement indicated it has become more acceptable for women to take their children to clinics because there is an expectation that they should do so; they would not be doing their duties as mothers if they did not. As pointed out earlier, education has also been a major factor in contributing to the self-confidence of educated women, and the respect held for them. This has also been boosted by the ability of women to enter more prestigious and remunerative jobs as a result of education.

Nevertheless, while changing social expectations and education have contributed to the changing status of women in society and within the family, it is questionable whether the changes would have taken place or have been so profound, if such changes were not acceptable in Sri Lankan society.

We explored family decision-making by asking all respondents in Loluwagoda, Welisara and Rahatungoda who decides when a woman takes her child to hospital. There was a very interesting contrast in the answers of the respondents from the Rahatungoda Tea Estate and the respondents from the two low-country sites. In Rahatungoda of the 216 respondents who answered 154 respondents (71 per cent) said it was the wife's decision but added the corollary that she needed her husband's agreement. Another 21 (10 per cent) said it was solely the husband's decision, and 20 (9 per cent) said it was the responsibility of other family members (presumably parents-in-law). Only 21 (10 per cent) said that the child's mother could decide on her own. In contrast, in Loluwagoda and Welisara a much higher proportion of respondents, 147 out of 340 (48 per cent) said that the woman could decide by herself. Nevertheless, 130 (45 per cent) still required the husband's permission and in 24 cases (8 per cent) it was the husband's decision. Unlike in Rahatungoda no respondents

in Loluwagoda and Welisara replied that it was primarily the decision of other family members.

Some care needs to be taken in interpreting the responses to this question, as its precise meaning is vague. The question refers to taking a child to hospital, yet for many families the first place a child is likely to be taken for treatment is a local private practitioner either of Western medicine or the indigenous Ayurvedic medicine. For these families a child is likely to be taken to a hospital only after a few days if the initial treatment is unsuccessful. By this stage the couple are likely to have discussed the situation to determine what is the appropriate course of action. Hence response to the question may understate the degree to which women can initiate action. It may also understate it in another sense. The response 'with husband's agreement' implies the husband has a right to veto but my impression is that this agreement is often a formality.

Read in this light, the responses to this question indicate, especially in the two low-country sites of Loluwagoda and Welisara, that women had considerably more responsibility for the treatment of their children than was generally the case in South Asia. The data also indicate the centrality of the nuclear family, and this may explain the comparatively high level of female autonomy. In Loluwagoda and Welisara no respondent suggested that the agreement of other family members was necessary to take a child to hospital.

The strength of the nuclear unit is indicated by the fact that the Sinhalese have no equivalent to the Hindu joint family, where the family consists not of the couple and their children, but of the male agnates, their wives and children. Even where more than one married couple live jointly in a household, each couple retains a separate budget (see Yalman 1971). This point came out clearly in the in-depth interviews where Hindu families in Rahatungoda felt that they had a right to the earnings of their unmarried daughters, and where the old felt they had rights over the earnings of their married children. In Sinhalese areas such views were not expressed though the old might complain that their children were not looking after them properly.

The lack of an extended family is important in understanding changes that have taken place in health, and even more in fertility and marriage. Larger families are more hierarchical with family decisions being taken by the older generation and the males. They give less priority to the well-being of younger family members, especially girls who will not be contributing to the male line. Given that decisions tend to be made by the older family members, who are also less educated than younger members, larger families are more tradition-bound and less innovative. In larger families family resources benefit the more senior members most. In smaller families resources tend to be more evenly distributed with children getting more food and care. Most importantly, in small families, the couple, particularly the mother who, after all is closest to the child, is able to get treatment quickly. In larger families there are more obstacles to doing so in the form of expressed and unspoken veto rights.

The key question here is whether the lack of an extended family is a recent phenomenon or whether it has older roots. The strength of the nuclear unit in Sri Lanka and the corresponding weakness of the claims of relatives appears to be long-standing, though it has been reinforced by modern influences such as education and urbanization.

Anthropological and historical writings indicate that the Sinhalese have never had a joint family (Yalman 1971). There are probably two principal reasons for this; the first relates to the kinship system. Sri Lankan society, Sinhalese, Tamil and Muslim, shares with South India what anthropologists refer to as the Dravidian kinship system. Dravidian kinship involves strong ties between affines linked by marriage, as well as kin linked by blood. Strong affinal links seem to conflict with the very notion of the joint family which depends upon emphasizing kin links, the unity of the male members of the lineage in opposition to

outsiders including affines. At the very least, it gives extra support to the young bride who retains her links with her family.

The other factor is religion: Buddhism, unlike Hinduism, does not emphasize the subordination of the individual or the couple to the wider family. As Yalman (1971:102) has noted, for Hindus the family is a unit of worship, with each household having a 'god's room' and gods to whom the family owes allegiance; in Buddhism worship is essentially a concern for the individual.

The strength of the nuclear family unit, and in particular the position of women within it, has been reinforced by modern factors including education and the increasing participation of women in the formal labour market. In the new town-based society, individuals depend less on their families' status and resources and more on their own abilities and attributes. The effect of these changes has been especially profound in relation to fertility and particularly marriage.

The fertility transition

A similar range of questions were asked concerning the causes of fertility decline, as of the mortality decline. The older women in Welisara and Rahatungoda Estate were asked why people had more children in former times. In Welisara the major reason given, 36 out of 79 (46 per cent), was that they did not have access to family planning then. The second reason given by 27 respondents (34 per cent) was that there were no economic problems in former times, while five respondents replied that girls married earlier then. These very practical answers have a good deal of truth. A national family planning program has been implemented and age at marriage has risen. While per capita incomes have grown, the post-war economic confidence of the 1950s was replaced in the 1960s and particularly the 1970s by much less certain economic times and higher unemployment.

In Rahatungoda, a lower proportion attributed the changes to an increase in family planning services, 16 respondents out of 59 (27 per cent). This may reflect a lower use of the family planning services; the low use of modern contraception for its fertility rate has been the subject of some controversy (see Langford 1982).

The most common explanation in Rahatungoda as to why people had more children in the past was that there were fewer problems then. This is understandable given the extremely difficult economic conditions of the estates in the 1970s and early 1980s. Interestingly, fertility fell early amongst the Indian Tamils, the major population of the estates, in the extremely difficult economic circumstances of the 1960s and 1970s; in the more prosperous conditions of the 1980s it was showing signs of rising again (Ratnayake, Retherford and Sivasubramaniam 1984:36).

In contrast to Welisara, 12 of the respondents in Rahatungoda said that in former times large families were not considered a burden, and another four replied that families then wanted children's help. Apparently in the past the cost of children was less, in part perhaps because there was less pressure to educate children, though education rates remain low amongst estate children. The value of children has fallen, in part because employment opportunities on the estates are extremely limited. In the past much of the burden of childcare fell on siblings. The greater emphasis in Rahatungoda on the changing benefits and costs of children's labour indicates a more hierarchical society where children are expected to contribute to the family's welfare.

None of the responses to the question why families had more children in the past referred to changes in family decision making. We nevertheless asked women in Welisara and Rahatungoda who in the family decided on using family planning. The answers reflected the same pattern as those for the question on decisions concerning children's health

care. In Welisara, of the 268 respondents who answered and were practising family planning, 144 (54 per cent) said that it was the wife's decision, 50 (19 per cent) that it was the husband's, 72 (27 per cent) that it was a joint decision, and two (one per cent) that other family members participated in the decision. Of the 176 respondents in Rahatungoda who replied and practised family planning, 48 (27 per cent) said the wife decided, 83 (47 per cent) the husband, and 45 (26 per cent) that it was a joint decision.

As with the question on child health care an important finding is the lack of involvement of relatives in fertility decisions. Only two respondents said that other family members had a decisive say in family planning. This is in contrast to the situation elsewhere in South Asia, where joint families were more common. In such families a couple's fertility behaviour is very much a concern of others, particularly the husband's relatives, because their children belonged to the whole family.

The most interesting finding is the remarkably high proportion of responses, particularly in Loluwagoda and Welisara, that claimed that the wife made decisions regarding family planning without reference to the husband. At first sight this seems an extraordinary figure for a South Asian society, but I believe it to be an accurate reflection of the situation.

The Sri Lankan Family Planning Program is based upon the motivational work of female family health workers. These workers have concentrated their efforts on the women, telling them that they will benefit economically and in their own health and that of their children. In effect they are pushing the message that family planning is essentially the wife's business, but that it is in her interests to limit her family size.

The effect of the health workers' efforts has at least superficially been to increase the women's say in this area of family life, though in reality to achieve the State's ends, namely a reduced population growth rate. The acceptance of this message has been helped particularly among the Sinhalese by a family system where relatives outside the conjugal unit had little direct say in fertility matters.

Nevertheless while the approach has had remarkable success it has not been universally accepted. It has had less acceptance by the estate Tamils amongst whom there is more of a concept of the joint family and also the Muslim community where there is less acceptance of female autonomy. More surprisingly it has had less acceptance amongst the educated.

When responses to the question concerning fertility decision making were broken down by education, they showed an unexpected pattern; the higher the level of education of the respondent, the lower the proportion of women who were able to decide family planning on their own, and the more likely they were to decide it jointly with their husband. My interpretation of this pattern is not that the better educated women had less influence within the family but that the influence of the family health workers and the national family planning program was greatest with the poorest and least educated. A contributory factor may also be a stronger marriage partnership between the more educated.

Marriage

The most distinctive characteristic in the South Asian context of Sri Lanka's fertility decline has been the contribution of changes in the age at marriage. Age at marriage amongst women has risen substantially this century though the change has been much less amongst men. As indicated in Table 2, female age at marriage has risen this century by approximately six years from a level that was already well above the South Asian norm.

The reasons for the changes in age at marriage are complex but reflect changes in the position of the individual in society and particularly in relation to the family. We asked the older women in Loluwagoda, Welisara and Rahatungoda why marriage was later now than when they were young. The overwhelming answer was female education and jobs. In

Rahatungoda a minority of the respondents also emphasized economic problems reflecting the comparatively depressed economic conditions of the estates.

Table 2
Singulate Mean Age at Marriage (SMAM) by sex in census years (1901-1981)

Census year	Males	Females
1901	24.6	18.5 ^a
1911	26.9	19.9
1921	27.5	20.6
1946	27.0	20.7
1953	27.2	20.9
1963	27.9	22.1
1971	28.0	23.5
1981	27.9	24.4

Notes: ^a Fernando (1975) records the female SMAM for 1901 as 18.1.

Sources: 1901-1921 census figures, Dixon 1970:205. 1946-1981 census figures, Nadarajah 1986:100.

The respondents were asked why the reasons they had identified as being responsible for the delay in marriage had had these effects. Easily the most common reason given was the direct time effect of education, working and saving, though a number also identified what may be the indirect effects of education such as female independence. Rahatungoda respondents in line with their responses to the previous question also emphasized economic problems.

The most interesting point about these changes is not whether they are correct or not, but the sheer acceptance they imply of late marriage. When the same women were asked the reverse question 'why did girls marry early in your youth?' they gave many of the same reasons, most frequently that girls did not have education. The single most common answer in Loluwagoda and Welisara, however, was that parents wanted to be free of responsibility. Another common answer was fear of elopement. In Rahatungoda, the most common answer was that parents arranged a girl's marriage at puberty; other answers included moral danger and that economic conditions were better then.

Concerns about parental responsibility for marriage and elopement have largely disappeared amongst the Sinhalese of Loluwagoda and Welisara, and equally the requirement to marry daughters at puberty and concerns about moral dangers have weakened among the mostly Tamil population of Rahatungoda. In the past a young woman's ability to marry depended largely on her family's status and wealth and her reputation for morality and hard work. A person's position in society depended on their position as a member of a family; the family provided status as a consequence of its position within the community, and in terms of its caste. Caste, though weaker than in India, was and to some extent still is an important factor in social status in rural Sri Lanka. In these circumstances where it is the family's position that is important there are few hindrances to early marriage, and some advantages. For example, early marriage protects the reputation of young women in societies where concepts of caste purity and family honour means there is an emphasis on virginity and female modesty as is the case in South Asia.

Increasingly, however, in Sri Lanka, a young women's marriage possibilities depend more on her own individual abilities than on those of her family. It is her attributes in terms of such characteristics as education, which is increasingly regarded as vital to be a good mother, and her ability to earn an income. These take time to acquire, and longer to demonstrate. Where unemployment is high as it has been in Sri Lanka, it may be necessary

to wait until she actually has a job to show her employability and her prospective husband has a job to show the feasibility of the marriage. In this situation late marriage is almost inevitable. These pressures have also affected males, but the pressure in the past for early marriage for males were always much weaker and hence the male marriage age has been much less affected by the changes.

Consequently, age at marriage has changed not so much as a direct consequence of education, but because of what education represents, a new social order in which education is a key social marker to success.

The situation in Rahatungoda is somewhat more complicated than this. Age at marriage there is extremely high, although by any objective measurement a new social order of the type referred to has not emerged. The reason for this may be related to the specific nature of the economy of the estates, where the prime demand for labour is for tea picking, work traditionally done by women; and many families are dependent on the incomes of their unmarried daughters. Consequently, there are few economic advantages for a woman's own family in marrying her off early. Valli (Household 8-162) remarked that parents are delaying girl's marriages because they want the girls to finance their own wedding as much as possible. Some parents do not even think of getting their daughters married as they want to live on the girl's earnings. Valli commented 'that is why some of the girls elope and get married. How long can anybody wait?'

The increasing individualism of at least low-country Sri Lankan society, and the accompanying diminution of the role of the family, have been associated not just with a delay in marriage but also with changes in the nature of marriage. For families marriage involved the reproduction of the family and the creation of valuable alliances with other families. The changes in the nature of society have emphasized the conjugal unit, and reduced the direct interest of the family in the marriage. One sign of this change has been a shift from family arranged marriage to self-arranged marriage, known as 'love marriage'.

Table 3 lists for the seven low-country field sites and Rahatungoda the proportion of arranged and love marriages by the year of marriage. The proportion of love marriages rose from quite low levels for those married before 1940 to the great majority amongst those who married in the 1970s and 1980s.

Clearly the move to love marriage has been much stronger in the low-country sites but even in Rahatungoda it has been strong. Sri Lanka's overall figures are likely to be between the two sets of figures but probably closer to the low-country figures. It should also be noted that, while there has evidently been a remarkable transformation in Sri Lankan marriage, love marriages have long been a common form of marriage; the pre-1940 figure of 27 per cent of love marriages for the low country is a figure which is unmatched today, to my knowledge, in any other part of South Asia.

In terms of what it reveals about the ability of the young, and particularly of young women, to act independently, the findings are important, but have to be treated cautiously. The term 'love match' is in some ways a misnomer. Sri Lankan society is not individualistic to the extent that Western societies aspire to be, nor are the resultant marriages necessarily fully companionate. The families often retain a degree of veto over the marriages, and indeed the matches very often approximate ones that the family would itself have made; this is of course true, to a lesser degree, of Western marriages. The choices of the young couple are examined by the older generation, and indeed the parents would be likely to nip in the bud any prospective match to which they were opposed. Welisara couples who had love matches were asked whether their parents agreed to the marriage (N=214); 86 per cent answered that they did, 12 per cent that they did not and two per cent that they accepted it after the marriage had taken place. Similarly, the young could be consulted on arranged marriages. Women in all the SLDTP low-country field sites, with the exception of

Bondupitiya, were asked if they had rejected any proposed matches put to them by their families: 31 per cent replied that they had, 17 per cent more than once.

Table 3

Type of marriage by year of marriage - low country and Rahatungoda

Age	Marriage Type		N
	Arranged	Love	
Low Country	%	%	
Before 1940	73	27	92
1940-1949	70	30	209
1950-1954	63	37	139
1955-1959	66	34	187
1960-1964	60	40	206
1965-1969	43	57	238
1970-1974	37	63	287
1975-1979	29	71	341
1980-1985	32	68	470
Rahatungoda			
Before 1950	94	6	31
1950-1959	93	7	42
1960-1969	87	13	54
1970-1974	67	33	33
1975-1979	59	41	41
1980-1987	62	38	74

Source: Primary analysis Demographic Transition Project, 1985-87.

Nevertheless, Sri Lankans do recognize important differences between arranged and love marriage. While family sanction is still required for a love marriage, it is nevertheless regarded as less of a family affair and the family is likely to be less directly involved in it. In particular, the family is less likely to provide a dowry and it is less likely to provide support for the young couple, especially important when the young couple are starting off and in the case of marital problems. However, even when it does not pay dowry, the family is still likely to pay for the marriage celebration. Those involved in love marriages are less likely to start off their married lives living with either pair of the couple's parents.

In sum, if the young couple choose to have a love marriage, in most cases they may, but it is also their responsibility; if anything goes wrong, they have only themselves to blame, as they will undoubtedly be told, and the family is not obliged to take any responsibility, either to get the couple back together, for example through its influence with the other family, or to assist by providing shelter or care. For these reasons many young people still prefer to have an arranged marriage.

The main reason for the increase in love marriage seems to be that families are no longer actively attempting to prevent love matches. When we asked women in Welisara why there were fewer love matches in the past, a majority replied that in those times families did not allow girls to go out unchaperoned. Most of the remaining answers also emphasized the lack of freedom given to the young and the unlikelihood of forming relationships beyond those which their families created. Answers in Rahatungoda similarly emphasized the lack

of freedom given to the young, though some also emphasized a greater obedience formerly to parents.

The changes that have taken place, especially in the low country, which have allowed the young greater freedom, were expressed by the respondents in terms of changes in family responsibilities. There seems to have been a subtle alteration in what is meant by family responsibilities. Parents continue to regard themselves as being responsible for the future welfare of their children but precisely what is concerned in this responsibility has changed; there have been corresponding changes in what the young owe their parents. In the past, and to some extent still among the Muslims and the estate population, parental responsibility meant for boys primarily a livelihood and for girls a good marriage. Now it increasingly means education and to a lesser extent a good job. The change had been most marked for girls. Parents now cannot fulfil their responsibilities simply by arranging marriages for their daughters.

The change in family responsibilities is a strong theme in the SLDTP's in-depth interviews. A respondent in Bondupitiya (Household 1-005) commented that her mother married at 13 because in those days 'parents were not educated and they wanted to be freed from the responsibility of their children'. Of her own children (two boys and two girls), as long as the children were willing to study, she and her husband would pay for their education. The main expectation is for their children to obtain higher education and to have successful lives. In Sirima's case (Household 1-001) her parents' concept of responsibilities had apparently changed so radically that they wanted her to delay her marriage as they hoped she would go to university. She expected that her own daughter would not marry until she was 25, because Sirima and her husband wanted their daughter to be educated and to get a job.

In summary, age at marriage, especially for women, is now later than formerly because what is required in a marriage partner has changed. It is now the individual's own qualities that are important rather than those of the family. These changes reflect wider social changes, and the development of a town-based society where individual achievement is increasingly important, rather than family status as was the case in the village-based societies previously prevailing. These changes have also acted to reduce the involvement of the family in marriage, encouraging love marriage. The increase in age at marriage may also have had an indirect effect on the arrangement of marriage in that marriage partners are more mature at the time of marriage, and their families may be more willing to accept their ability to choose. I believe this, however, to be a secondary point; families would not surrender control over marriage if it was still vital to their interests.

Significantly female age at marriage was always later in Sri Lanka than elsewhere in South Asia, and has risen further this century. The reasons for this are that factors making for very early marriage were always weaker, and the factors encouraging later marriage are stronger. Family status concerns were never as strong in Sri Lanka, importantly caste was always weaker. The absence of a joint family meant that there was less pressure on the value of an obedient daughter-in-law, who was so young on marriage that she would not challenge the authority of her seniors. The comparative weakness of family status and concerns about female chastity and modesty made the acceptance of primacy of individual attributes more possible.

Conclusion

The family has been central to the demographic transition in Sri Lanka. The fact that the central unit of the family was the conjugal unit with little influence from other relatives, and

the relatively high position of women have contributed to the mortality transition and been vital to the fertility transition.

In health, women as well as men were able to take the initiative in seeking treatment for their children. Furthermore, there was a comparatively equal distribution of resources within the family. This was important in that while there was some male preference, it ensured that even during shortages everybody had access to food. Mothers also had the resources to devote to children's welfare, including medicines. Most importantly mothers were able to devote their time to looking after their children rather than having child-rearing determined by their in-laws.

In terms of the health transition the nuclear family may also have advantages in being more innovative and less bound to tradition. In the larger families change can threaten the position of the elders; also in times of increasing access to education the senior decision makers are likely to be the least educated. The family structure has also been favourable to education, including that of girls. In the more patriarchal societies there are usually strong disincentives to educating girls; a girl's own family will obtain little return on her marriage. Furthermore the family into which she is marrying may not desire an educated bride for fear that she may not accept family authority. Besides, her education may be of little value to them, as such families are generally disinclined to accept women working outside the family in jobs made available by education. These concerns were not such an issue in Sri Lanka. For example while parents do not retain direct control over daughters' earnings on marriage neither do they retain control over a son's earnings, and they are almost as likely to be dependent on support from a daughter as a son in their old age.

Sri Lanka's family has been an important factor in its fertility decline, both in terms of changes in marital fertility and in marriage. Marital fertility has fallen because there has been little pressure from relatives on couples to have children, and because their costs have been rising in comparison to their perceived benefits. The comparatively egalitarian nature of the family means that parents gain less materially from having children, than in more hierarchical societies. Significantly, in Sinhalese families adult children even before marriage retain control over their own earnings. Parents' control over their children has been eroded as family status has become less important. Simultaneously the cost of children has risen, in part because of the increasing need for education. The increasing proportion of women working has also reduced the time they are able to devote to child-rearing, while education also means that children are less available to look after their siblings.

Perhaps most significantly family planning service providers have capitalized on the family system to emphasize family planning as essentially the women's concern.

Finally a major contribution to Sri Lanka's fertility decline has been made by changes in age at marriage. As noted above changes in the socio-economic system which have reduced the importance of family status and increased the importance of individual attributes have favoured a later age at marriage.

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Sexual initiation and the transmission of reproductive knowledge



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Abstract

Initiation rituals are still widely practised among the Kaguru of Morogoro district in Tanzania. Young women are introduced to the *digubi* dance at the time of puberty, and a version of the dance is performed at the time of marriage. This form of traditional theatre serves a function of education and socialization, and the question is raised of how much of reproductive behaviour is transmitted in this medium. Our informants suggest that notions of female dependence and standard of behaviour are conveyed in the process, but that information on child rearing and postpartum abstinence are transmitted by personal contact with older women at the time of the first birth.

In Africa, there are often striking differences in fertility levels between neighbouring ethnic groups living in similar environments. These can often be traced to cultural differences of an unobtrusive character affecting the proximate determinants of fertility. Diverse behaviour seems to be adopted routinely by groups without obvious reasons. For example, the normative age at marriage may be 17 years in one population, and 20 in another; it may be customary to breastfeed for more extensive periods in one group than in a neighbouring one; or the abstinence period after a birth may vary a great deal. Caldwell and Caldwell (1977) explored the importance of marital sexual abstinence in determining fertility, and African demography has not been the same since; but the Yoruba of Nigeria, which were the topic of their study, turned out to be quite different from many other ethnic groups of Africa in this respect, and the duration of postpartum sexual abstinence is one of the most important factors explaining natural fertility differentials.

How do the members of a group learn when it is proper to marry, how long a woman should nurse, or when a couple should abstain? The most likely path of transmission of rules affecting reproduction is from mother to daughter, in the daily conduct of family life or at the time when the young woman reaches certain important stages in her life, such as marriage or a first birth, to which nothing in her previous experience may have prepared her. Alternatively, it may be speculated that cultural norms, rules of behaviour, and taboos pertaining to certain life stages like puberty or marriage are transmitted in ritual ways, by special ceremonies, or in associations or secret societies, by the group's elders. Lesthaeghe (1989:Chapter 11) in particular has speculated on the importance of the latter path.

Under a grant of the Rockefeller Foundation to Etienne van de Walle, Chrysanth Kamuzora and Penina Mlama as principal investigators, fieldwork was conducted among the Kaguru of Morogoro Province in Tanzania. The work involved the collection of a small number of women's biographies (43 in all), and the administration of a structured questionnaire to about 800 women. This paper is based solely on the women's biographies. The respondents were visited twice by a woman interviewer, under the supervision of Professors Kamuzora and Mlama of the University of Dar es Salaam; they organized the tape recording, translation and transcription of the interviews. The authors of the present paper

claim no direct knowledge of the Kaguru and instead rely on the texts themselves as the single data source for analysis.

The Kaguru were studied during the 1950s by an anthropologist, Beidelman, who described puberty rituals and sexual initiation for girls in the following way:

At the onset of menstruation, girls are immediately isolated in a special house and subjected to intensive initiation rites. The purpose of these is to 'cool' the girl whose menstruation has 'heated' her, that is, made her sexually (and thus morally) unstable and potentially dangerous. During this period various substances (ashes and water infused with herbs) are put on her skin to 'cool' her. She is taught by women of her grandmother's generation and girls who have already been initiated. The girl is taught various riddles, sayings and songs with double meaning relating to proper sexual conduct and sexual hygiene. Traditionally, the girl was required to remain indoors for many months; today she is usually only kept indoors for a short period of a few weeks. In the past it was said that being immured caused her to become pale and fat, two attributes of beauty. Kaguru girls are (or were in the past) subjected to labiadectomy. This is said to 'soften' the girl and thereby make her better able to bear children. At present this operation is not practised on all Kaguru girls... (Beidelman, in Molnos 1973:264).

One remarkable aspect of this description is that it seems to refer to a somewhat different set of Kaguru customs from those practised in the area where, and at the time when, our survey took place. Only one of the respondents in our survey seemed to echo the procedures described by Beidelman:

Normally in Kaguru culture when a girl becomes mature she is kept inside the house for some months till when she gets a fiancée, so the day they take her out, *digubi* is danced... There were no dances at my marriage; the dances were during the time when I was circumcised and when I was sent out... During my *digubi* dance I was not yet courted, so it was not directed so much towards marriage, as how to live as an adult (34-year-old Kaguru woman).

Perhaps the time which has elapsed since Beidelman's fieldwork, and changing cultural practice, are responsible in part for the discrepancy; perhaps the customs differ from place to place among people who call themselves by the common name of Kaguru. One of the researchers involved in our study, Professor Penina Mlama, wrote her Ph.D. dissertation on theatre forms, and particularly on rituals of sexual initiation practised by the Kaguru of Kilosa district in the Morogoro region of Tanzania, where our survey also took place (Mlama 1990). She drew attention in particular to *digubi*, a rite of passage from childhood to adulthood for girls, in which

the life experiences of womanhood are represented with the practical purpose of instructing the girls on how to fulfil their various roles as adults. Enactments are performed that instruct on the physiological nature of the woman and its relation to reproduction processes, marriage life, parenthood and the obligations and responsibilities of women in the society (Mlama 1990:166).

The songs and the content of the instruction may vary from performance to performance, but the style of execution involves common elements: song, mime and dances backed by the beat of *nhunyi* drums, and a characteristic dance step:

The dance in *digubi* involves a fast, circular shoulder movement. The shoulders move up, back, down, front and up again. There is no stop between one complete circular movement and another. While performing this shoulder movement, the dancer moves in a circle with the other dancers in short and fast walking steps (Mlama 1990:172).

The participants mime the content of the song, and include the new initiate or initiates in the actions of mature women of the community.

Mlama's field investigation of actual *digubi* performances was completed in the late 1970s. She witnessed performances and collected *digubi* songs. The rituals serve vital cultural functions. They introduce new adult members to the cultural traditions of the group, and they help integrate them into the community. Mlama found that *digubi*'s function is both to impart information and to provide a means for socialization. At a material level, the focus of the instruction is on menstruation and sexual hygiene, on how to conceal menstrual blood, dispose of sanitary napkins, keep the body clean, etc. Moreover, in addition to the initiation which occurs normally shortly after menarche, there are also *digubi* dances at the time of marriage. Here the *digubi* performances introduce the new bride to the details of the sexual act, and teach her how to behave towards her husband and her in-laws.

Almost twenty years later, in 1994, we found that 92 per cent of the adult women interviewed in a survey of two villages (which constituted the second stage of our survey) reported having danced *digubi*. This number is extraordinarily high in comparison to the women interviewed in depth in our small sample of women for whom we collected birth histories, but it indicates that the *digubi* rituals are alive, and potentially important. In the collection of women's biographies that was completed in 1993, we asked questions on the *digubi* and its content. We were interested in learning whether it was an information medium through which instructions about abstinence and child care were transmitted. It turned out that it was not. We also asked how the respondent had learned about child care and sexual abstinence after a birth. It is on those materials from the biographies that the present study is based.

***Digubi* in the biographies**

The first element that strikes us in the interviews is that the term *digubi* is used somewhat loosely by the respondents. Sometimes, it refers to the initiation ceremony itself; sometimes, to the song and dance that is the means used to convey information to the young girls who undergo the passage into adulthood. *Digubi* refers alternatively to the puberty rituals or to the sexual initiation that occurs at the time of marriage. One woman said:

There are several *digubi* between puberty and marriage, and the last one is for giving lessons to the girl, when the girl is about to get married (56-year-old woman).

Furthermore, a great many other puberty or marriage rituals that are not technically part of *digubi* are sometimes lumped together under the name. For example, one woman gave the following account of her wedding:

There was a type of *digubi* known as *chilondolondo*. The bridegroom's relatives came to our home one day before the wedding to dance *chilondolondo*, a dance which needs the bridegroom's relatives to search and find the bride where she is hiding... That dance taught me how to live with my husband... I was taught to respect my husband... My husband's relatives told me that when [they] visit you, you should show respect and love them (37-year-old).

But another woman contrasted *digubi* and *chilondolondo*:

Digubi was not popular during that time in my area, so people danced *chilondolondo*... There was *digubi* too, but it did not last long. This is because people were afraid of the church because any local dance was a sin (56-year-old).

Several respondents alluded to *chilondolondo* (literally 'search and search'), a dance which is performed at the time of the transfer of the bride to the groom's family and is not a *digubi* dance (Mlama 1990:146).

Another woman did not dance *digubi* because she belonged to the church, and there was no *digubi* at her marriage in 1922. There were, however, dances at the time of paying the bride price:

When they come with the bride price on the way they sing a song, there was a special song, when they enter the compound they create chaos threatening to destroy the house, creating a lot of dust, they are given hand hoes and begged to cool down... Then they pay the bride price, they say 'we need a clay plate for carrying fire' [i.e., the bride]... 'Which one do you want? There are many girls here', then they mention 'so and so — a fire plate'. 'Okay, we like it this way as our bride price', then they take out the bride price and present it.. Then the dancing starts, the mothers celebrating that their daughter has got a man, 'I thought my daughter was ugly but she is beautiful, I didn't know'. 'I did not get womb pains for nothing' kind of dancing and singing (85-year-old).

Several of our respondents alluded to the battle that Christian authorities were waging against traditional dances in general, and *digubi* in particular, because of its sexual content. The opposition of the churches to traditional rituals is not a new phenomenon in the region, and it is difficult to ascertain how much the customs have changed since the 1970s.

There was *digubi* at my marriage. ... almost all traditional teachings were cut short... They said that there were religious people there, so they did not like to teach each and everything in the traditional style... I was taught how to live and respect my husband (50-year-old).

Our brother was a Church teacher, so he did not allow us to dance *digubi*... We attended dances when children were circumcised, in such ceremonies we danced *shilanga* (40-year-old).

The mother of this last woman had died, and she was raised by her brother. Having missed the *digubi* initiation, she was totally ignorant about sexual matters, and did not understand that she was pregnant when her periods ceased.

In a population that is very largely Christian, it is possible that the traditional ritual has lost some of its meaning and that its explicit sexual teachings have been softened. Moreover, fewer women are exposed to the dance and it is possible that society does not rely on this medium to transmit information as much as it did in the past. Although Mlama insists that only women who had been initiated themselves in *digubi* ceremonies could participate in the instructions of others, some women in our sample reported participation without having been initiated at the time of puberty or marriage.

I danced *digubi* when I was already married... I had never done that before marriage, but I saw other people dance *digubi* (35-year-old).

I play the small drums (*nhunyi*) when *digubi* is performed... I was never involved in *digubi* when I was married... I got religious knowledge earlier, so I didn't want to be involved in it... But all my sisters passed through *digubi* (29-year-old).

Others had only witnessed the dance as spectators. One respondent had been ambushed as a girl by other women and circumcised by force, because the church was against circumcision. At her marriage, she did not know how to dance *digubi*, so she simply watched. Even among those who had been initiated, some expressed doubt about the meaning of the ritual.

I can't see the meaning of *digubi* dance. Parents say it should be danced in order to show the girl some womanhood. A stiff porridge is made in a clay pot. You dance while

somebody is shaking the pot like making it dance, but actually I can't see the reason for that (49-year-old).

Most women were reluctant to describe the exact content of the dances. Traditional *digubi* danced at the time of puberty was described most explicitly as follows:

Digubi is a dance for teaching a girl to take care of her body... you are taught ways of taking care of yourself and body cleanliness...

Traditionally I was taught before I was courted... (43-year-old).

As for *digubi* at the time of marriage, it seem to have become more and more a joyous celebration involving hours of dancing and feasting. Some women (reluctantly and discreetly) allude to miming of the sex act to instruct the new bride, a feature which was an important component of the ceremonies witnessed by Mlama. Some instruction on behaviour towards the husband and the in-laws is imparted, but it is not always clear how much of that is featured in the dancing, and how much is actually part of a more private session of sexual initiation of the bride which is conducted in a restricted circle of relatives:

During the *digubi* ceremony... they told me marriage life... They told me to care for my husband when I get married. I should consider his body as my body. I should prepare him bath water and wash him and also have sex with him (35-year-old).

They taught me when you go to your husband work hard. You must respect your mother-in-law. If a guest come give him/her bath water and prepare him/her food and prepare him a bed to sleep. You will meet with your brothers in law they will crave you don't accept them (49-year-old).

[The relatives of the bridegroom] eat and then take off your hair and in the night teach the girl how to live with her husband... They teach you that you should take care of your husband and the most important one is that you should respect your mother-in-law... you should respect and obey your husband. You must wash his clothes. You should take care of him in everything. You don't have a child but your husband is your first child, that is how they emphasized.. They teach how to live with your husband, but when you realize that you don't get your menstruation, then inform your husband and your in-laws... The first person to teach me was the wife of my grandmother's brother; when she was finished, the in-laws came to teach me. [Her mother was the last to come, and spoke only a few words.] (67-year-old).

One gets the impression that the purpose of the instruction is double. First, in a society where there is a great deal of sexual segregation and little open discussion of sexual matters it is necessary to resort to solemn and ritualized means to convey information that had until then not been accessible to the new bride. However, in a number of instances, our informers had had premarital sexual relations, and it was therefore assumed that they did not need instruction.

My father said that he did not see the point of performing such teaching because I had children (32-year-old).

The second function is one of socialization. The wife is told about her future duties, about her obligation of fidelity to her husband, and the rules of etiquette regulating relations with her in-laws. She learns that her proper place is one of subordination. Allusions are made to the link between intercourse and the future pregnancy. Our materials reveal no specific references to the young woman's vocation as a reproducer or the prospect of spending the rest of her adult life pregnant and bearing children for a man and his kinship group. It can be assumed,

however, that the context is pronatalist. Finally, our informants were emphatic that no information is imparted in *digubi* rituals about care of the child.

Learning about child rearing and abstinence

As do many sub-Saharan populations, the Kaguru observe a period of postpartum abstinence. Beidelman mentions the abstention from sexual relations during nursing in the beginning of his account, but he implies that the Kaguru abstain for precise and specific reasons, and that they clearly connect intercourse and 'poisoning of the milk':

Indeed it is considered rather shameful for a nursing mother to become pregnant... Such a woman is said not to have enough consideration or proper affection toward her present child and to show lack of discipline and undue interest in sexuality, rather than in her obligations as a mother. The Kaguru say that pregnancy dries up the mother's milk, and advocate a long period of nursing for infants, always over a year and possibly between two and three years. Although ideally, a couple with an infant should not have sexual relations, many and perhaps most do so, while practicing various forms of contraception, such as coitus interruptus and the use of certain herbal medicines (Beidelman, in Molnos 1973:262).

In the interviews on which we report here, the women were asked how they had been taught about caring for their first child. The answer was generally that some older female relatives had instructed them, either when they were close to delivery, or after the birth of the child.

I was taught how to care for children when I was about to get the first one. Mama Sarah and my sisters participated (56-year-old).

I was taught [about child care] after I got my first baby ... by the grandmother of my husband... My father's mother was present during the process, so the instructions were provided by the two grandmothers on behalf of my parents (36-year-old)

I was not taught how to care for children... My mother told me that since you have a baby you should not have sexual relations with your husband, otherwise you will lose your child (31-year-old).

I was not taught, so I had to get another baby the following year (35-year-old).

The obligation to abstain after a birth appears to be the major piece of information that is conveyed by 'experts' (i.e. other women with childbearing experience) after a birth.

My grandmother taught me that because now I have a baby, I should not entertain sleeping with my husband the way he likes it, but if he needs other things I should give him (60-year-old).

...they told me when you get your child you should care for it. You should not have sexual relationship with your husband (56-year-old).

Almost all women mentioned this, in the same breath as they said that they had had no other instruction on child rearing. There was no mention of withdrawal or herbal contraceptives, as in Beidelman's account. The women who reported using contraception seemed to use modern techniques obtained from the local family planning.

The exact duration of postpartum abstinence was not spelled out in a consistent fashion: abstinence should last 'until the child has grown up', 'until the time she started to have teeth', 'until the child is about five or six months old', 'till the baby is able to walk'. Abstinence was an almost universal recommendation, but the duration recommended was not particularly

long, perhaps because the marital situation of the abstaining woman becomes untenable. As one woman said:

I was taught at home before birth: take good care of the baby and don't involve yourself with the man. But if he demands strongly you have to agree what else can you do? (58-year-old).

Incidentally, for many women the period of abstinence appeared to be a time of vulnerability, where the husband may have been revealed to be drinking or going out with other women. The strains that the abstinence period places on the life of Yoruba couples have been discussed at length by Caldwell, Oruluboye and Caldwell (1991). A similar phenomenon appears to prevail among the Kaguru.

The reasons given for abstaining were not particularly explicit. In most accounts, the young mother had been instructed to do so, and accepted the authority of an older woman without debate, perhaps until it was countered by the higher authority of the husband. In only one instance was a reason given: the child would die if relations were resumed too early.

Conclusions

The place of rituals in the diffusion of reproductive modes of behaviour remains poorly investigated. Our main tools, the fertility surveys, have not touched the topic. The anthropological literature has often provided tantalizing glimpses. Dances in particular serve several functions. They can provide an opportunity for girls and boys to meet in an inhibited fashion. A good illustration is provided, in East Africa, by Davison's (1989) account of the Gikuyu, whose dancing parties lead to non-reproductive physical contacts among young people that strongly evoke the bundling of European lore. Dances can also serve to disseminate serious information among women. And finally (perhaps most importantly among the Kaguru), they serve to instruct women about their proper place in society.

Others have described similar initiation rituals in the region, and noted their decline (see for example Lockwood 1989). Their role in transmitting culture is certainly worth studying. Is their function mainly 'the control of women's reproductive capacity' (Lockwood 1989:319)? Is it similar to the collective support for the regulation of sexuality and fertility by Kenyan women's groups described by Ahlberg (1991)? Is there in these matrilinear societies of Tanzania, a strong 'sisterhood of women' transmitting female lore for the benefit of its members, and secretly undermining the authority of men? Or are the rituals mainly a means of strengthening the authority of husbands and that of the power structure in the new family where a young woman is introduced? All these questions deserve an answer.

We note the success of missionary churches in capturing a great part of the popular following that at one time attached to traditional rituals, often by using the same type of instruction techniques by song and dance. In doing so, the churches have weakened the traditional family and the ideology of women's subordination.

A final issue is raised. How might a particular family planning message be diffused in the population by techniques that borrow from traditional rituals, in the same fashion that soap operas are used in Latin America, and puppet shows in South-East Asia?

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Stealing a bride: marriage customs, gender roles, and fertility transition in two peasant communities in Bolivia



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ABSTRACT

This paper deals with changing marriage customs in a pre-transitional setting where nuclear households and relatively high female status have been dominant values. Two Bolivian communities are compared. In one of them, the persistence of early marriages is associated with a specialized agricultural economy where women play roles as wives and mothers as well as partners in agricultural production but are not engaged in autonomous income earning activities. Women maintain a relatively subordinate, even if highly valued, position within the family. Marriage customs are simple, with little parental opposition to early marriage. In the other, economic diversification and tertiarization of the economy, as well as the emergence of a youth culture, are producing a revolution in marriage patterns. Increase in female age at marriage is associated with an extension of spinsterhood, growing acceptance of courtship, and a decline in parental influence over the selection of marriage partners. These are processes promoting both nuclearization and an increase in the bargaining power of women within the nuclear family, conditions for the emergence of favourable attitudes towards birth control. Marriages are taking place later as a consequence of the increasing individualized capacity of females as income earners. Young men achieve independence much later today than in the past, and have to show individual resourcefulness in order to find a wife. Stealing a bride, a ritualized version of elopement, is a key aspect of marriage customs through which men show the ability to constitute a new household.

Marriage customs, parental authority, and gender roles

The relevance of changes in marriage customs for fertility decline has long been recognized, mainly within the framework of European demographic history (Hajnal 1965; Coale 1973). It is well known that rising female age at marriage, and higher rates of celibacy, affect total fertility even without any changes in marital fertility rates. The relevance of changes in marriage patterns for fertility control within marriage, however, is less clear. Rising age at marriage might precede, or even stimulate, a greater acceptance of birth control. With increasing age at marriage, marital ties become less dependent upon broader kin obligations, an emotional bond within the couple becomes the ideal for mate selection, and gender roles within marriage may become more egalitarian (Brodie 1994). Prolonged spinsterhood and open courtship may set the conditions for individual choice. Women's concerns about childbearing and childraising can be expressed more easily in fertility behaviour when couples are formed on the basis of individual choice rather than parental pressure.

Caldwell and his associates have questioned whether changes in traditional marriage customs which favoured low age at marriage in pre-transitional societies did in fact reflect a desire to limit fertility. A reduction in parental pressure for early marriages may occur without any specific concern, on the part of the elders as well as of the young couple, to limit marital

fertility (Caldwell et al. 1989). Intensive study of Sri Lanka's long-term increase in age at marriage leads them to conclude that this trend was a response to population pressure independent from any conscious effort to reduce the number of births. Yet this reasoning does not preclude the possibility that the decline in arranged marriages, and the growing ideal of romantic love, facilitated the emergence of attitudes favouring smaller family size.

Early marriages in many pre-transitional, patriarchal societies result from parental arrangements designed to forestall unsuitable unions. Matches are often made well before marriage can in fact be consummated. Women marrying young, without having any choice about timing or selection of a partner, are placed in an extremely subordinate position within the new couple mainly when married out of their communities and to men considerably older than themselves. However, arranged marriages, large age differences and a concern about virginity are not universal among pre-transitional societies (Murdock 1964; Schneider 1971; Schlegel 1991). In many cultures the pressure for early marriage results from the relevance of marital status for adulthood and full recognition in the community, rather than from the weight of patriarchy. Endogamic rules and bilateral kinship strengthen women's relative status within the couple even when married at young ages, providing them with continuous access to resources from their family group. Patriarchy is by no means a constant feature of pre-transitional societies. Yet, even in those societies, changing marriage patterns — including the emergence of courtship, prolonged spinsterhood, the ideal of romantic love within the couple replacing kinship pressures and economic ties — have consequences for gender roles within the family and thus might well affect fertility behaviour within marriages.

The broader relevance of marriage customs for the fertility transition becomes clearer when relations between generations and those between genders are considered separately. The concept of patriarchy, often used in explaining the desire for large families in traditional societies, does not distinguish clearly between these two types of relationship (Folbr., 1983). When older males control household decision-making processes towards achieving their own goals, which tend to coincide with uncontrolled fertility and parental choice of marriage partners among the young, females, who might otherwise develop an interest in limiting pregnancies or childbearing, have no power to express this interest. The transition in the demographic decision-making process, from the extended to the conjugal household, might in fact be initiated by changes in marriage customs: nuclearization implies a greater autonomy of the young couple from parental concerns. Also, it may lead to more egalitarian gender roles, thus allowing women to forestall extended kin pressure and obtain spouses' response to their own sexual and procreative demands (Caldwell 1976, 1978; Cain 1982). As Giddens suggests, 'the spread of ideals of romantic love was one factor tending to disentangle the marital bond from wider kinship ties and give it an especial significance' (Giddens 1992:26). Although romantic attachment is no guarantee for female sexual autonomy, it certainly favours more equilibrated gender-based power within marriage.

Increased female autonomy and a growing sense of individuality are relevant for fertility control, since women, rather than men, may initially develop the motivation to limit family size (Secombe 1992, 1993). Historians have argued that women's unwanted pregnancies, and greater sexual freedom, resulted in the growth in child abandonment (Kertzer 1993) and in the widespread use of abortion (McLaren 1990), during the nineteenth and early twentieth centuries. Birth control techniques which became increasingly used within marriage, such as *coitus interruptus* and condoms, although male-dependent, involved a degree of communication and co-operation within the couple which probably was absent in strongly patriarchal family systems (Brodie 1994). Thus, increasing female autonomy and women's greater control over their bodies, including their sexual lives, may be preconditions for the widespread acceptance of birth control.

This paper deals with changing marriage customs in a pre-transitional setting where the traditional family structure does not show strong patriarchal features: nuclear households and relatively high female status have been predominant in the Andean culture since pre-colonial days. Early marriages traditionally reflect the relevance of marital status for adulthood in a peasant society where women's work is highly valued and complementary gender roles are the ideal. Two communities are compared as to the changes in marriage customs within the same cultural tradition. In one of them, a specialized agricultural economy which limits the autonomous contributions of women, and the relatively abundant supply of arable land, have sustained early marriages with few changes in gender relations within the couple. In the other, economic diversification and tertiarization of the economy as well as the emergence of a youth culture are producing a revolution in marriage patterns, increasing female autonomy and setting the stage for a growing demand for birth control among younger couples.

Gender roles and female autonomy: the Andean case

Much of the demographic work about the onset of fertility decline in traditional societies has focused upon family systems characterized by the predominance of the patriarchal peasant family, based on unilineal descent groupings. The worldwide ethnographic sample studied by Michaelson and Goldschmidt (1971) showed the quantitative predominance of such a pattern, but also the wide variation within the model itself. Historical studies of the development of mediaeval household patterns in Europe also indicated time variations in patriarchy: agnatic inheritance systems favouring the male line, associated with an emphasis upon female chastity and monogamy, replaced cognatic households predominant among elite families in the early Middle Ages (Herlihy 1985). Patriarchal control over children, as described by authors such as Stone (1977) among the English landowning class, might have been considerably less prevalent among families of lower status.

The Andean world has been characterized by complementary gender roles in productive activities, the high value placed upon women's contributions to the household economy, and relatively high female autonomy. The persistence of these traits within the household and the pervasive presence of women in crafts, trade, and services, in spite of the patriarchal nature of Spanish colonial domination, has often been noted. The long colonial exploitation of Indian labour did weaken the status of women within the domestic economy, but it did not seclude them from production. Extensive ethnographic study of an Aymara-speaking peasant society in Bolivia, for instance, led Harris to conclude that '...if there are elements in social relations among the Laymi which may be considered patriarchal, they are not primarily placed within the domestic unit' (Harris 1985:30). According to Harris, the crucial idea to understand the symbolic world of the Laymi is *chachawarmi*, the couple as a unity, consisting of the words for man or husband (*chacha*) and woman or wife (*warmi*). Rituals involve the presence of *chachawarmi*: couples are always together in ceremonies — status is conferred on both married man and woman — while single people must be accompanied by somebody from the other sex. The same concept is echoed in the organization of the household as a social and economic unit, with each couple having a unique set of kin relations with other units. As an economic unit, man and woman are expected to work together since the absence of either one of them is believed to bring bad luck.

Mallon (1987) describes well the prevalence of relative female autonomy among various social strata in the central highlands of Peru at the turn of the nineteenth century. Within the elite class, for instance, she finds that partible inheritance created many substantial female property holders, whose dowry remained legally theirs after marriage. Women often controlled, managed, and operated very large *haciendas* and commercial properties. Among the town middle sectors, women were also important, engaging in tasks such as labour management, moneylending, and of course trade. In the villages, smallholder peasants,

normally engaged in diversified agricultural and non-agricultural activities, also showed similar patterns of division of labour along gender lines which allowed for a variety of income-earning activities by females. Both younger and older women monopolized activities in local and regional markets, within a broader patriarchal political and economic system at a national level.

Female autonomy within peasant villages and Indian corporate communities is promoted by the practice of endogamy as well as by partible inheritance, including anticipatory forms, which allow females access to parents' land after marriage. Extensive systems of reciprocity based upon kinship are also bilateral. Some degree of virilocality is typically present, with newly formed couples normally moving on a temporary basis to the groom's household until a new one is established, but exceptions in the opposite direction are abundant. The ideal of nuclear household independence is actively sought and achieved with the help of both families involved, as well as of fictive kin (*compadres*). Women bring both property and support, as well as a set of duties, to the new household, almost always located not far away from either of the two families of origin. The ideal of independence, however, is closely tied to the ideal of an egalitarian contribution of both family lines to the new household.

Nuclear family independence does not entail a break with extended kin-based systems of exchange. Individuals in the Andean culture are involved in a complex set of rights and obligations within very wide, bilateral kinship networks, which marriages reinforce (Lambert 1980). Fictive kinship (*compadrazgo*) is also produced through marriages and births. Nuclear families are tied in extensive networks composed by bilateral kindred groupings (often called *ayllus*). Although nuclear families are the basic units for the administration of property and economic decision-making processes, households are usually involved in wider exchange systems of a reciprocal nature. In recent years, however, prolonged spinsterhood and late marriages increased the tendency towards nuclearization, promoted further independence within the married couple, and set the stage for female autonomy to be expressed regarding childbearing and childraising.

The setting: two rural areas in the Bolivian Andes

In the mid-1980s we conducted a study of two rural areas in Bolivia¹. One of them, Ucureña, is a locality in the irrigated valleys of Cochabamba where population has tended to cluster in nucleated villages. The population is closely connected to local and regional markets, but has kept both a land-based economy and a peasant identity in spite of increasing economic diversification and tertiarization of activities. The community of slightly over 4,000 people spreads today around the major road leading to the city of Cochabamba, two hours away by bus. The population is bilingual in Spanish and Quechua, although the latter is the preferred language at home and often the only one handled fluently by women. Ucureña was the site of the first experiments in rural education in Bolivia begun in the late 1930s, and most boys were already attending school for at least a few years in the 1940s. Basic literacy is thus common among men, but less so among women. The latter have started to attend school on a regular basis only in the last few decades: one out of six women over 30 had completed primary school, but already one-half of younger women did so. Their mothers had been, in most cases, illiterate and monolingual.

Our data for Ucureña are based upon a sample 103 households where we conducted extensive interviews with men and women about marriage processes, household formation,

¹The study, conducted by Jorge Dandler and myself, was supported by an award under the Population Council's International Research Awards Program on the Determinants of Fertility (Balán and Dandler 1986). See also Dandler and Medeiros 1988; Balán 1995.

and fertility. Interviews with young, unmarried males and females, as well as participant observation of marriage ceremonies, provided supplementary information. We also obtained detailed data on income generating activities by sex and age. People from Ucureña have settled in the city of Cochabamba, in the nearby lowland areas, and in Argentina. Further interviews were conducted in these sites. More young men than women leave for migrant labour in Argentina, the favourite site to accumulate resources in order to marry and form a new family, while migration to the other two destinations has a more balanced sex ratio.

The other rural area is located in the highlands, still poorly connected with the city of Cochabamba and far away from any important urban centre. Its economy is entirely based upon a specialized potato agriculture, which has increasingly displaced other agricultural activities and animal husbandry, although the peasant ideal is still self-subsistence. Specialization and intensification of land use, rather than diversification, have been the local responses to increasing population pressure upon the land. Land subdivision has also promoted out-migration, largely for coca and other cultivation in the lowlands.

We chose to study two dispersed rural settlements in the district of Ayopaya, with a total population of about 1500 people. These are largely monolingual Quechua communities, although men, and increasingly women too, have a working knowledge of Spanish to handle transactions outside the domestic sphere. Schools were built in each of the two localities in the late 1950s, and offer the first years of primary education. All but a few women over 30 are illiterate, but around one half of the younger ones have learned how to read and write. Literacy among males is considerably more extended, even though few have completed primary education. Except for the teachers in the local schools, who are outsiders, nobody has had any formal post-primary education.

In Ayopaya we interviewed men and women in a sample of 71 households, and also some younger men and women not yet established independently, several unwed mothers still living with their parents, and a few widow heads of households. Also we interviewed migrants from Ayopaya established in the subtropical lowlands, where the population is almost exclusively devoted to agricultural activities. Women's labour is almost entirely circumscribed within the household in domestic activities and around it in taking care of farm animals and otherwise helping their husbands in tending the fields.

The valley peasants, who call themselves *campesinos*, refer rather derogatorily to the highland inhabitants as *laris* or *gente de la estancia*, emphasizing differences in cultural and economic status. Urban dwellers in the nearby town of Cliza, who identify themselves as *vecinos*, derogatorily classify both of the former as *campesinos*; and before the peasant uprisings of the 1940s and agrarian reform of the 1950s they would more often have used the term *indios*. Cliza's urban status is symbolized by the plaza, the church, a town hall, and some density of professionals, like lawyers and doctors. Quechua, which has incorporated in Cochabamba a number of Spanish words, is spoken at home in all three localities, but there are important variations in the extent to which Spanish is also spoken, as well as in the mixture of Quechua words within it.

Population growth has resulted in an increased pressure upon limited land resources, but with varying intensity and consequences. The big landed estate which dominated life in Ucureña for almost three centuries, a convent property, was already in a rapid process of subdivision and decentralization by the turn of the century (Dandler 1969). Many sectors were sold or rented to smaller landholders who lived in the city. Smallholders had also been able to purchase family plots. Peasant mobilization in the 1940s was organized to obtain purchase rights over land cultivated under agreements with large tenants. In the valley, density was already felt by the time of the agrarian reform, the growth of non-agricultural activities (trade, crafts, and migrant labour) being organized within the boundaries of a peasant economy.

Tertiarization and the growth of a cash economy both favoured peasant mobilization and were fostered later on by agrarian reform.

In the highlands the picture was almost the opposite: labour, rather than land, was scarce. Large *haciendas* concentrated land, there were almost no independent peasant cultivators before the reform, and a crude system of labour exploitation reflected the difficulties *hacendados* faced to recruit and retain labourers. The *hacienda* land was distributed among tenants in the 1950s, with beneficiaries receiving large family plots. Population growth rates have accelerated in the last two decades, and the pressure upon the land was met by more intense potato cultivation (which is affecting land quality) and out-migration.

In spite of these many differences, at the time of our fieldwork the two settings could be largely described as 'pre-transitional'. The major difference between them is found in mean age at marriage (indicated here by cohabitation): in Ucureña females start marital life on the average three and one-half years later than in Ayopaya, a difference largely explained by the increase observed in recent decades. Also, celibacy after age 40 is non-existent in Ayopaya but relatively significant in Ucureña, around ten per cent. Marital fertility is high in both communities: the mean number of births of ever-married women in the older cohorts is 6.8 in both places.

We found, however, clear signs of change in Ucureña. Women often expressed a desire not to be burdened with children, and gave indications of an interest in birth control. Such a desire reflected both their many occupations outside of home, for which childraising was a definite handicap, and a desire for a changed lifestyle for them and their children. Some 40 per cent of the females said 'I'm careful', or 'we are careful' (*me cuido, nos cuidamos*), largely meaning temporary abstinence. Only a few women in the sample admitted to the current use of contraceptives, while others reported past use, mainly those who had spent some time in Argentina. Local nurses and doctors indicate that many women request contraceptives, mainly injectables, about which they learned in Cochabamba or in Buenos Aires, but did not want their husbands or other people to know. Men's attitudes were different: only a small minority said they 'were careful', even though many expressed a concern about the economic crisis and land shortages making it difficult to support many children. More men than women referred to 'God's will', and mostly recognized abstinence as the only, but very unlikely, solution. Neither men nor women in Ayopaya expressed an awareness of birth control as a possible practice within marriage, although everybody had heard or knew about abortive practices and the possible use of folk medicine and ritual to either increase fertility or avoid pregnancy.

The local supply of contraceptives was strictly limited in Ucureña, with no family planning clinics or services available. Services are more abundant in the nearby city, but they are largely private-sector and receive no promotion nor subsidies. Birth control was not openly discussed in the community and there was no information in the media (television was becoming widely available). The Bolivian official policy was, and still is, largely pronatalist, or at least against family planning. Abortion was a strictly taboo topic in public: the belief that natural disasters may be caused by the souls of unborn, unbaptized children was widespread. Yet young women in Ucureña are known to resort increasingly to abortion, which although illegal is becoming increasingly available in Cochabamba. Even in Ayopaya while doing our fieldwork we heard rumours about several recent suspected cases of abortion, carried out outside the community.

Young women in Ucureña were at that time showing clear signs of changing attitudes and behaviour. With delayed age at marriage and probably earlier menarche, they faced many fertile years before starting regular marital life. Since sexual experimentation was and still is quite common, one would expect a sharp increase in out-of-wedlock pregnancies. However, such was not the case at the time of our fieldwork. Many young couples expressed a desire to

limit family size, although the ideal is still relatively high. Exploration of this topic proved to be particularly difficult. Our suspicion that abortion was becoming more widespread could not be substantiated further than the reports obtained from medical personnel and teachers.

Marriage customs in the Andes

Andean anthropologists have discussed marriage customs in the region for some time (Mayer and Bolton 1980). The debate originated in observations dating from the first years of the Spanish conquest which suggested the existence of a 'trial marriage', a period of marital life with limited commitments accepted by the community (Price 1965; Carter 1980). Chroniclers at the time of conquest and other visitors observed the relative indifference of Indians regarding virginity. Premarital sexual experimentation and extended periods of cohabitation before marriage were seemingly very common. Although the idea of a 'trial marriage' has now been discarded, it is clear that marriage in the Andes is to be seen as a process rather than as a single event, the main features of which survived the many efforts from Spanish colonizers to impose Catholic rituals.

The overall framework of the marriage process emphasizes, on one hand, kinship rights and duties involving the two family lines, and on the other, the socialization of bride and groom within the couple. Customs of indigenous origin, certainly changed over time, include a series of ceremonies which symbolize the transition of the new couple into full community membership and an independent status. The ceremonies emphasize patterns of reciprocity and exchange to be found within the *ayllu* or ethnic group since pre-Columbian times.

The Catholic ceremony, involving the presence of a priest, has been widely adopted as the last stage in the marriage process. In the past, Catholic ceremonies in the countryside were often sponsored by landowners and authorities during special occasions to regularize the situation of couples living together. They were infrequent, collective ceremonies, which gave legal recognition to ties which were well rooted in local custom. In recent decades the national state and civil laws, which have entered the countryside only during the last 50 years, replaced the Church in this role, even if the Catholic ritual is also kept in most cases. Today civil marriage has become very widespread as the most accepted sign of legitimacy and carries greater legal consequences in case of property disputes. It also became an indication of respectability and was incorporated as a ritual mandatory for entry into full adult status within the community.

These different but overlapping traditions combine to produce a series of rituals which mark stages in marital tie formation (Bolton 1980; Collins 1983). Three stages have been distinguished (Carter 1980). The first one is defined by the recognition and acceptance of the new tie by both families involved and relates to the ritual of petition, which ends with the bride moving to live together with the groom, usually at the latter's household. The civil marriage ceremony follows at some later occasion, which in recent times has been reduced to weeks or days but in the past may have taken years after cohabitation started. The second stage involves service relations between the couple and the parents' household, where the couple lives. During this stage, the couple is supposed to accumulate goods and experience enough to become independent, and receives training from the parents. The ideal of 'service' — leading at times to a rather crude exploitation of the youngsters' labour, mainly that of the young bride, before a new household is constituted — combines reciprocity with socialization and learning. The couple slowly adjusts to marital life, develops autonomy, and gains status within the community. The third stage involves a religious ceremony, moving to a new house, and is often crowned in its completion by re-thatching the roof (Gose 1991).

Although separation is easier at the early stages of the marriage process, it is by no means frequent. Price (1965) estimated that only one in six couples who initiated cohabitation ended in separation before the religious ceremony. Separation is also possible afterwards. Land

property received as anticipatory inheritance remains individual, so that after separation it reverts to the side where it came from. Remarriage after separation or widowhood, with or without children, is also common among men as well as women.

Marriage ties develop through a series of rituals which reinforce the agreement within the couple as well as the set of reciprocal duties with both family lines. From a strictly demographic point of view, however, it is important to notice that cohabitation starts immediately after the first petition ceremony. Very often it is initiated a few days earlier since, as will be described more carefully in this paper, the marriage process is often started by elopement, sometimes called *rpto* (kidnap) or *robo* (stealing): the young man arranges to take his bride forcefully away from her family, usually with her consent, sleeping together for one or more nights. *Robo* shows his willingness, and ability, to start marital life. If successful, it initiates a series of negotiations rapidly leading to cohabitation, often within the groom's parents' household. Occasional sex may precede elopement, or take place without any long-term consequences if pregnancy does not occur.

Changing marriage customs²

The persistence of early marriage in the highlands

Older men and women in the highlands of Ayopaya associate the past with the times of the *hacienda*. They remember the last days of the *hacienda* rule, already challenged by strong peasant uprisings in the 1940s, an important antecedent of the revolution which led to the agrarian reform of 1953 (Dandler and Torrico 1985). The two localities studied are typical ex-*haciendas*; in fact, in one of them the most important *vecino* is still the old administrator. The *hacienda* property before the reform was divided between a centrally organized sector under the direct control of the administration, and decentralized activities carried out by peasant holders under various forms of rent tenancy. Heads of households, largely males, were the link recognized by the *hacendado* between the two systems. Land plots were allocated to family units through the head, who was responsible for labour services to be paid to the *hacendado*. Family, rather than individual, labour was exchanged for land, with different obligations assigned to family members according to sex and age status.

The labour system did little to reinforce parental authority since the *hacienda* exercised considerable control over the whole family. Married males would be absent several days a week, unless they were able to send older children (or paid workers, if rich enough) to pay their dues. Married females were exclusively involved in domestic and productive work within the household-controlled economy. In fact, freed from duties with the *hacienda*, women had a crucial role in handling the domestic economy due to the continuous absence of their husbands.

Single females, young or old, as well as widows, were an important source of labour: they were in charge of domestic tasks and took care of the animals. These women, especially the younger ones, were subject to the direct authority of the administration, who would hold their parents responsible for their misbehaviour. *Mitanis*, as they were called, were often subject to sexual abuses by *hacienda* owners and administrators. In the 1940s, when the peasantry revolted, many of these families went to court complaining about such abuses, and the women's testimonies in such trials offer a rich source of data on these matters.

² Throughout this section, the present tense is used to describe marriage customs studied through interviews and direct observation during 1984-6, while later visits served to confirm trends such as increasing acceptance of open courtship and shortened cohabitation periods before formal marriage.

The agrarian reform in the 1950s radically changed power structure and labour use in Ayopaya. Land redistribution increased family welfare but favoured men more than women. Male heads of households took control over their own labour. Their wives' lives changed considerably less, since they had not been working for the *hacienda*. Young females now stay at home, while young males do not have to work replacing adults. Young men feel an added incentive to marry young and obtain independence, while young women have a rather diminished position within the parental household. Young women's autonomous contributions to paternal family income in a specialized agricultural economy are not very large, although women do assume a number of productive responsibilities on top of their domestic chores. Their presence, however, becomes crucial for a new household to be formed, since it is unthinkable for a man to attain independence and cultivate the land without a woman and family of his own.

Before the revolution, parental permission, and above it the word of the *patron* — who was actually referred to as *tatay* or 'my father' — was required for a couple to start living together and form a new household. This requirement was mandatory when the young woman was a *mitani* and when either the bride or the groom were orphans. The *patron* had considerable power to arrange marriages, and often used this power to enlarge his labour supply. Tenancy rights, which could occasionally be given also to women but necessarily involved the work of men, were used for this purpose. Quite a few landless outsiders, sponsored by the *hacienda*, married local young women and settled in Ayopaya, but not even one young woman was brought by marriage from outside the district's villages. All women eventually married, and remarriage of widows was very common. Early marriages were the common rule: around 60 per cent of females interviewed were living with a man by age 18, while their mates were only one or two years older. Then, as now, military service at age 18 was the recognized condition for men to start looking for a woman to marry.

Arranged marriages, with the partial exception of *hacienda*-sponsored unions, were not the rule in the 1940s, when our older informants were youngsters, although parents would often actively intervene on their own, and most certainly upon the request of a marriageable son. Young men could not gain economic independence or become full, adult members of the community without getting married. Two major changes were introduced simultaneously by agrarian reform. On one hand, there was no longer an *hacendado* whose authority had to be respected, nor labour service which took the youngsters away from home and made the prospects of starting a new household largely dependent upon the *hacendado*'s willingness to provide access to a plot of land. On the other hand, land reverted to the peasant households in the names of heads of households, normally identified as males by the law.

The traditional systems of bilateral, anticipated inheritance helped to preserve the possibility of early marriage even when land subdivision followed. Marriages combined, through the addition of the individual components, land plots subdivided through partible inheritance. The rising number of surviving children, however, resulted in a process of continuous subdivision (and dispersion) which could not be restrained through marriages.

Courtship patterns have changed very little in Ayopaya since the 1940s. Even during the *hacienda* days, in most cases young boys and girls started courtship on their own, usually in secrecy, and within the framework of a very restricted public life. Distance from the house was required for unsupervised encounters, which took place either while herding animals in pastures located at higher altitudes, or when labour duties took young men and women away from the household for several days in a row. Religious *fiestas* were also favourable for such encounters, including in this case the presence of outsiders from nearby villages who would at times marry girls within the village. Open courtship was, and still is, very restricted, since affection, even among married couples, is never shown in public. Young men with an interest in starting a relationship show it through eye contact and conversation. As in other Andean

communities, visual communication with the use of mirrors, reflecting sunlight in the appropriate direction in the open fields — i.e., while tending animals — is a common practice. The spoken word in itself, when generating an appropriate response, may be taken as an expression of affection and the beginning of a possible relationship. A young man starts the conversation while the young woman has the option of turning him down by rejecting the dialogue. A persistent dialogue is by itself a sign of affection, and an eventual interest in getting together, even if her words apparently mean rejection or lack of interest. Actual rejection is expressed by avoidance and non-response. Once mutual interest is established, the young man talks to his parents who, if approving, offer themselves as mediators to talk with her parents. Courtship tends to be very short, from a few days or weeks to perhaps a year, but never longer since there is no way to legitimize an attachment while keeping it secret.

Older men report that premarital sexual experimentation was quite common. Older women, however, seldom recognize having had sexual intercourse with other men before marriage, except in the context of unions started and broken down. Elopement, in the form of *robo* or ‘stealing a woman’, was known but hardly common. A couple would resort to this practice only under special circumstances, forcing the girl’s family to accept the marriage. Elopement was particularly disapproved when the man was alone or when the girl was a *mitani*: the offender usually temporarily left the village, but still faced punishment upon his return. His parents would be punished if the offender did not show up.

If successful and approved, courtship leads to a period of cohabitation, normally at the boy’s parents’ household, until a formal marriage is arranged. Parental approval is still necessary since the couple cannot establish a new household without such support. In the past, the *hacendado* or administrator also had to be consulted, since the young man would aspire to join his father in renting land from the *hacienda*, or eventually rent some on his own. Parental agreement allows the couple to start living together almost immediately, as soon as the young woman’s parents have given approval under ‘trusted word’ (*por palabra*), a formal commitment to get married. The petitioning ceremony, which is called *manaqa*, is a rather simple one, with little festivity and no further exchanges of gifts or property. The female’s family acceptance is obtained relatively easily in Ayopaya. Reciprocal labour exchanges based upon kin have limited application in a specialized agricultural community such as Ayopaya, and thus family alliances through ceremonies and rituals do not have great importance in this community.

From the petitioning ceremony on, a rather prolonged period of *convivencia* or ‘living together’ normally starts. The ideal is to shorten this period as much as possible, but the growing difficulties in getting established locally have led to more extended periods under this system. The incoming member of the couple, normally the female, ‘pays service’ in exchange for help in preparing a new household. The young woman is taught by her mother-in-law what she needs to know in order to keep a house on her own, while the couple learns to live together. Although the system often leads to the exploitation of the incoming female, it is possible for her to go back, although at the cost of losing face. Separation during this period, although not common, is much easier than later on, when children had already been born.

Migrant workers who settle as coca cultivators in the lowlands also require a family, and most young men return home in order to look for a wife. Courtship, elopement, and marriage become tied to this migration process and seriously shorten the marriage process and undermine the custom of cohabitation within the paternal household. Migration serves to maintain low age at marriage and high nuptiality rates.

A formal religious ceremony is held when the couple is already independent, has established a new household, and often has had one or more children. Civil marriage ceremonies, practically unknown until the revolution, have recently achieved social weight but are not yet mandatory, as is the case in the valley. For all practical purposes, rights and

obligations within the couple, and between the couple and both sets of parents, have already started and are effective during this period of *convivencia*. This marriage ceremony, in the rather austere environment of an agricultural community, is often short and does not entail large expenditures.

The prevailing image of the marriage process in Ayopaya today stresses the needs of a young man for a wife, both sexually and in order to become independent and start a new household. It is supposedly up to him to first find the appropriate consenting girl, then to convince his parents of the legitimacy of his desire, and for the latter to humbly request another family to give their daughter as a wife. Land availability is by far the major restriction. A major asset of a young woman for marriage is her expected land inheritance, which she will bring to the new household even if kept under her property. Her needs receive little attention: it is supposed to be natural for a young woman to get married and leave her parental household, while her parents' concern is mainly that she will be well treated, that she will not marry a lazy man or one with no property.

Parental opposition from either side is uncommon in Ayopaya today. Courtship activities are simply ignored: neither the young man nor the woman will tell their parents about what is going on until they are ready to elope or to start living together. The woman's parents seldom exercise strict control. Young women go about their normal activities unsupervised, although since in Ayopaya they do not engage in trade, only tending animals takes them far away from home. Yet young men and women are not to be seen together in public, since once a relationship is out in the open the pressure mounts to start the marriage process. The extension of schooling for both boys and girls is starting to change this picture somewhat, but only primary school facilities are locally available.

Elopement, a show of force as well as resourcefulness on the part of the young man, is not a very common event in Ayopaya. When it does occur, it takes place with the man's parents' approval, since in most cases the young couple will hide at their home for the night. Parental reaction to elopement on the girl's side is normally mild in Ayopaya. There are very few cases when parents go out of their way to bring the girl back home. The main reasons for a woman's family to reject a possible marriage are age and locality. Somebody who is too young will not be taken seriously, and families will normally reject marriage with an outsider if this implies the daughter will be taken far away. There is, however, considerably more specification about who might be a good mate for a young man, largely in economic terms. The chosen woman must be hardworking, and having some land is definitely an asset. People in Ayopaya believe today, as they believed in the past, that the normal adult man needs a wife. He needs her as much for sexual satisfaction as for maintaining an independent household. She complements the man's productive activities and works side-by-side with him in cultivation. But she is irreplaceable within the household, and no man may pretend to have an independent life without a wife to cook for him and have a place ready for rest. The value of a woman's work is considerably higher as a wife than as a daughter. Parents do not expect to gain much from the daughter's marriage, since family alliances are of little use in Ayopaya.

Delayed marriages in the valley communities

In Ucureña, *hacienda* rule was markedly different from that in Ayopaya since peasants had increasingly obtained autonomy through land purchases, establishing themselves as *piqueros* or small landholders. Land, rather than labour, was already in short supply. Labour systems were extremely complex, with many different customary arrangements, all less coercive than in the highlands. Ucureña was a much more stratified community than Ayopaya, with many gradations of wealth, landed and otherwise, and a wider variety of sources of income.

A longer history of miscegenation and acculturation also resulted in cultural bilingualism, a widespread cash economy, and greater economic diversification and autonomy of the

peasant households as compared with the highlands. Parental authority and control over the young predominated over that of the landowners and administrators, who had less interest and authority in arranging marriages to suit their needs for labour. National institutions, represented by civil authorities, a few schools, the military, and local political brokers since the late nineteenth century, were offsetting the monopolistic power *haciendas* enjoyed in more isolated regions. Last, but not least, the major absentee landowner in Ucureña was a convent, which as a corporate body had greater restrictions than individuals in handling its property.

In Ucureña civil marriage and the public offices dispensing them were established before the 1952 revolution, displacing the religious ceremony in its legal functions but certainly not in some of its social functions. The civil ceremony became prevalent as an important step for citizenship and legal rights: the marriage certificate became relevant for inheritance, to legitimize children's status, and even for school attendance. Civil marriage became part of a changing identity, the growing sense and pride in national citizenship, as well as of belonging to the peasant community represented by a union or *sindicato*. Religious marriage, however, has continued to be regarded as the final legitimation of a couple and of its acceptance in the community, normally years after the couple has established economic independence, has had one or more children, and can afford the sizeable expense of such a ceremony.

As civil marriage, a rather simple ceremony, became easily available and customary after the revolution, *convivencia* or cohabitation became increasingly unacceptable. The woman's parents normally make the marriage certificate a condition for accepting the new couple living together. The certificate becomes the guarantee to protect the woman's rights, while for the community as a whole it marks the distinction from the highland 'Indians' or *laris*. Cohabitation is possible only when the couple settles out of the community. Married couples seldom spend more than a few weeks or months at the parents' household, and normally expect to have a house of their own. This pattern certainly approaches the urban ideal of middle-class respectability developed in most Western societies. The major difference is introduced by the reluctant recognition of open courtship and, more strikingly, by the persistence of *robo* as the expected means of initiation of the marriage process. Thus, the following description of the marriage process in Ucureña will emphasize changes in the courtship process and the role of elopement, or stealing a bride.

Non-agricultural activities, largely dominated by women in rural Ucureña, always provided a setting for encounters between young men and women. A typical case was *muqueo*, the gathering of young women, generally in the evening, for fermenting maize beer or *chicha*. This was a common domestic economic activity undertaken by women in *ayni* or reciprocal labour, rotating from one house to another in preparation for a religious festivity, or a family ceremony, or to generate a cash income. Young men, generally as a group, would also attend to help and meet girls. Young women were also sent to various workshops of friends or relatives as apprentices, to learn a craft or trade like sewing, weaving, hat or soap making. After the agrarian reform the system of local weekly markets developed a consistent flow of traders, normally women, between localities; young girls usually accompanied their mothers or other female relatives. Markets provide many chances for courtship and unsupervised encounters. They are also places where drinking and a festive environment develop easily, settings associated with courtship and very often elopement.

Until recently it was not acceptable for young women to be seen in the streets of Ucureña with young men alone. Unsupervised encounters among the young had to take place in hiding or outside the community, and home visits, except in groups and around some task, were ruled out. In fact, there was no external recognition of a courtship relation within the young woman's household. A girl or young woman would be scolded, or even punished, if it was known that she had a *novio* or boyfriend, and this might lead to greater supervision, if not

seclusion. Thus, individual encounters had to be clandestine. Surreptitious dating situations, called *pololeos* or *enamoramientos*, generally took place in the open fields or during market activities outside of Ucareña.

Market activities are only one among many institutionalized settings allowing for encounters today. Increasing school enrolments by girls, now often through their teens, allow the more common grounds for new relationships among youngsters. Dancing, the growth of secular *fiestas*, and sporting events are key modern features of contemporary life in Ucareña. Parents are still supposed to be strict with girls, and insistent upon narrowly controlling their lives. Although the norms are increasingly difficult to enforce, courtship is not yet formalized and is still conducted in relative secrecy from parents: *novios* are either pressed to go ahead and marry, or forbidden, with no visiting rights granted without a commitment for imminent marriage. The issue is not virginity, which plays no role in any discussion on courtship and marriage, but rather the unacceptable ambiguity over who is in control of the girl's behaviour: the father or the (expected) husband.

The practice of 'stealing' a young woman (*robo*) still holds today as the preferred mechanism to open up a clandestine relationship and announce publicly the interest in getting married. Although open encounters are becoming the rule among the young —there are modern dances, public drinking places, and many festivities, in addition to the regular weekly markets — *robo* is still the means to announce marriage intentions. Almost all couples interviewed started the marriage process with an elopement (previously arranged stealing of the bride), and one third of them eloped twice or three times owing to parental opposition. Elopement is common even among better educated couples with professional expectations. A young man is expected to 'steal' the woman in order to deserve her. Otherwise, he is blamed for lack of courage or taken to be not interested enough in her.

The burden of the elopement process is on the male: it is he who is responsible for making the arrangements necessary for the occasion, including finding a cover for one or more nights, generally with a trusted relative, and obtaining the support of his parents to initiate the petitioning process. But it is also he who will face the shame of a possible rejection on the part of the young woman's parents. Of course, a young woman who 'lets herself be stolen' by somebody who does not pursue the marriage process, or who becomes unacceptable, will also face undesirable consequences. She will certainly gain a bad reputation, mainly if this happens to her more than once. Her responsibility is to be stolen by the right candidate, but it is the young man who has to show that he is serious and that his intended wife is valuable by stealing her from her family.

Robos thus take place with the agreement of the young woman, but agreement is surrounded by ambiguity. A decision to elope might be carried out after considerable drinking, and the woman may report that she did not know what she was doing, or that she was taken under some false pretence. However, there are relatively few cases of *robo* without the intention of getting married, even if there is no major penalty to the young man if he does not follow the expected procedure afterwards: relations between the families involved may be strained, but there is seldom an attempt on either part to force a marriage against the participants' will even if pregnancy results. A pregnant daughter and single mother, although at times severely punished, will be accepted back home with no permanent damage. Failed elopement may be followed by a second, or even a third attempt later on: insistence in the face of opposition may be needed when the latter is in fact strong, generally because of striking inequality between the families. Failed elopements with no follow-up, generally caused by considerations of age, bring different but unpleasant consequences: the boy loses face and is often tempted to leave the community, perhaps in order to gain resources and experience needed for a marriage. The girl may face a beating, greater control, and heavier duties. Pregnancy may, or may not, change the outcome: at times pregnancy leads to a greater chance

of marriage, but often parents will prefer a single mother at home to what they consider a bad marriage.

The morning following the *robo* the young man arranges for his parents to learn explicitly of his decision, about which very often he has not consulted in advance. The young man, however, needs their approval: his parents have to be involved in the petitioning process. They first go to ask the young woman if she accepts the union, before paying a visit to her parents asking for her to be married to their son. They have to make sure of her acceptance in order not to lose face in the following step. The girl's parents will almost necessarily show indignation and opposition to the marriage. They may attempt to bring her back home, refusing to meet the boy's parents or special envoy. Refusals are not uncommon, while the young man may insist, first by humbly asking forgiveness for having taken the young woman away. But if his and his parents' efforts fail, he may insist by eloping again at a later occasion.

Parental objections on his or her side are quite usual and often result in marriage delays or a broken relationship. Age and relative wealth, on both sides, are recurrent themes. Males did not make acceptable marriage partners until they were 18, and are now normally required to be considerably older. Women's lower age at marriage has swiftly moved from 16 years to 18, but the median age is considerably higher, over 22 among currently married women below 40 years of age. When the young man is more educated or has middle-class aspirations, his parents will strenuously object to his marrying down, and vice versa. Opposition, however, is raised also for the opposite reasons: if he is from a richer or more educated family, her parents may oppose the marriage under the suspicion that she will not be properly treated or respected. Families prefer level marriages because they expect to reinforce reciprocal relations with each other, and know that reciprocity within a hierarchical context entails a very different pattern of obligations. Although reciprocity arrangements are established in a variety of ways, kinship provides the most 'natural' setting, and kinship established through marriage adds the most significant possible bonds to establish reciprocal service arrangements.

Successful elopement leads to a rather elaborate procedure of *pedido de mano* in which his side asks her side to let the young woman leave the parental household by showing deference and providing food and drink for the occasion. The petitioning ceremony in Ucureña is an occasion for prolonged drinking and eating, involving large numbers of relatives, friends, and neighbours. It is the first setting to test if families are in fact compatible. His side provides the amenities, but then has to provide the new couple with a room (often the best one) until they build, with both families' help, a new house. The two sides are supposed to provide equivalent contributions to the new couple. At the time of formal marriage families compete in showing how much they give the new couple, but the ideal sustained, in the past and today, is of a carefully balanced arrangement in which each side provides an equivalent part of the dowry.

Other than age and social status, personal characteristics are also relevant. Previous marriages or children, on either side, are always a handicap. 'Bad reputation', in the case of women, is also relevant. But a key factor is industriousness: men have to be able to show they can support a family, women that they are not lazy and know how to work, at home and in other activities. The petition ceremony involves long considerations of these personal characteristics. His parents usually argue in his favour, while her parents insist that she is not ready, is too young or inexperienced, but implying that she is perhaps too worthy for the candidate. Then, it continues with the basic arrangements for the following ceremony, civil marriage: a date has to be set, sooner rather than later (by imposition of her parents); whether it is going to be a 'closed' ceremony, held privately, or an 'open' one with many other people invited and entertained; and whether a religious ceremony, with considerable more expense, will take place jointly or not.

Courtship secrecy, the practice of *robo*, and complex negotiations, all serve to indicate the high value of the young woman and the unwillingness of her parents to let her go unless the circumstances are ripe. Looking at these rituals from the young man's point of view, what is required of him is that he actually prove, to the girl and to her parents, that he has the resources to support a new household. This proof became more difficult to pass when both land and jobs for young men grew less and less available, a condition fostering their temporary migration to Argentina or elsewhere. Marriage prospects increasingly depend on the young man's individualized resources and his earning capacity, and less on his family's wealth. His maturity is each time more a precondition for marriage than its consequence.

The greater the value of the young woman's contributions to family income, due to extended diversification of the local economy as well as increasing female education, the higher the price young men had to pay in order to obtain a proper marriage. These trends have had a positive effect in delaying the age at which civil marriages take place in Ucureña, since *convivencia* is unacceptable without this legal procedure.

The ritualization of *robo* shows the increasing importance of violence in establishing male roles in Ucureña. Violence is largely symbolic in this case, since the young woman in most cases is willingly taken, and the violence is directed against her family. Thus, both members of the couple, but mainly the young man, have to beg the family's forgiveness for what they have done. The young man is competing with her father or brothers in establishing control over the young woman by taking her away from them. Such control is established also by the actual use of force. Woman battering is an extended custom throughout the Andean world, extensively reported in the ethnographic literature and a common observation in peasant villages as well as in the cities (Schuler et al. 1994). Our observation is that it is far more common, and dangerous, in valley communities like Ucureña than in the highland ones like Ayopaya. One important difference is probably found in alcoholism, which is much more prevalent in the former communities. Another difference is the increasing autonomy of women in the valley.

A possible interpretation, congruent with our description of *robo* in the context of the marriage process, is that battering becomes more common when the male status within the household is more insecure or has to be established. The underlying fact may often be that the woman is very independent and the husband regrets his diminished status within the household. As a rule, either the father (older brothers in his absence), or the husband, has a 'right' to beat the woman, but not both. When the young woman is single, she is under the supposedly strict supervision of her father, although seldom directly. Young women constantly defy paternal authority through the very nature of their extended activities and are permanently facing the risk of violence. Later on, this supervision is exercised by the husband. The *robo*, as suggested above, shows the young man is ready to take over this control from her father. In the marriage ceremonies it is common that parents will warn their marrying daughters about this fact. After marriage the woman is not supposed to complain about a beating to her relatives. In very dramatic cases of repeated beatings, women will tend to seek the support of the couple's *padrinos* rather than that of her parents, since paternal intervention will assume, or provoke, a separation.

Thus, female autonomy within the household — in a woman's activities, in disposing of her income or wealth, in actually controlling many decisions regarding household consumption and investment — often meets with a violent response, and submission, more often apparent than real, follows. This is a factor which obviously limits the extension of autonomy in sexual matters. An assertive wife insisting upon a limit to her childbearing responsibilities, perhaps suggesting birth control, is an obvious threat to an insecure husband. What we observed is that women claiming an interest in 'being careful' or actually looking for effective contraception seldom expect husbands' co-operation in these matters. Sex and

contraception were not yet open for discussion within most marriages at the time of our fieldwork. Rather, women were often tempted to solve the problem by themselves, or by checking with each other and with outsiders about contraception, as was found in other cultures (Brewer and Perdue 1988). Increasing female autonomy may be more easily shown in behaviour than in open, verbal opposition to males' wishes, real or assumed.

Conclusion

We have argued in favour of paying closer attention to marriage customs, in particular to those elements favouring female autonomy, because of their relevance for fertility decline. Increase in female age at marriage is associated with an extension of spinsterhood, the acceptance of courtship, and a decline in parental influence over the selection of marriage partners. These are processes promoting both nuclearization and an increase in the bargaining power of women within the nuclear family, conditions favourable to the emergence of favourable attitudes towards birth control.

The evidence presented draws upon an ethnographic study of two communities in the Bolivian Andes, a cultural area traditionally characterized by rather weak patriarchal features in spite of the social and economic roles played by kinship-based reciprocal exchange systems. In one of them we found the persistence of early marriages associated with a specialized agricultural economy where women play roles as wives and mothers as well as partners in agricultural production but are not engaged in autonomous income-earning activities. Thus, these women maintain a relatively subordinate, even if highly valued, position within the family. Young men are subject to strong pressures to marry early since they need a wife to become independent producers and members of their communities, while the needs of young women are subordinate to them. Parents normally expect the youngsters to marry early, and help them in doing so, although they do not intervene to arrange marriages.

In the other community, marriages are taking place considerably later largely as a consequence of the increasing individualized capacity of females as income-earners. Parental pressure, when present, is in the direction of delaying rather than anticipating marriages, since they place high value on the young women's contributions to family income. Young men, on the contrary, achieve independence much later today than in the past, and have to show individual resourcefulness in order to find a wife. Spinsterhood is much more prolonged today than a few decades ago, and there are strong pressures to recognize courtship as an open process. In this community we find signs of rapid change in attitudes towards birth control, mainly in the young generation, in spite of a rather hostile environment and the low availability of modern contraception.

The complex nature of the marriage process allows us only to suggest the causal chain leading from social and economic changes to greater individuation of the mate selection process and to more egalitarian gender roles within the family. Unfortunately, there are few intensive studies of marriage processes and the early stages of family formation. Such studies would probably shed considerable light on changing attitudes towards family size among young women and their ability to strengthen their bargaining position in this regard.

A major implication of this discussion for students of the fertility transition is that courtship patterns and marriage delay are important in setting the scene for fertility behaviour within marriage through their influence in female autonomy. The practice of stealing a bride offered us an opportunity to analyse such processes. A woman's autonomy, hidden by apparent passivity during elopement or submission to the husband within marriage, is supported by her increased economic contributions both to the parental home and the new household.

The evidence presented here is very limited, based upon two case studies within a particular cultural context. The Andean culture is atypical within pre-transitional societies in

the extent of female economic and domestic autonomy. This may serve, however, to refine our views about the role of a decline in patriarchal power in the process of fertility transition, given the significant, but often ignored, cross-cultural variability in pre-transitional family structures.

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Demographic transition and demographic imbalance in India



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Abstract

In the coming decades, there will be growing demographic disparity in India and, like economic disparity, this should be a matter of serious concern for our planners and policy-makers. This demographic disparity leading to demographic imbalance may cause considerable social turbulence and may even pose a threat to political stability. Demographers must look far beyond demographic statistics and anticipate the consequences of demographic imbalance between different regions and states in India as well as between different religious communities, castes and tribes. Relevant data based on 1991 Census and National Family Health Survey (1992-93) are presented to highlight the 'North-South Demographic Divide'.

The world population problem is zeroing in on South Asia and in particular, India, Pakistan and Bangladesh. India has a special responsibility in this regard because it is the second most populous country in the world, and is threatening to be the most populous country by the year 2035 or so. India owes to the world a speedy resolution of the population problem by rapidly curbing the birth and death rates as also the infant mortality rate. The crux of India's population problem lies in the states of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh, with a total population of 335 million in 1991, accounting for 40 per cent of India's population. Our acronym for these states is BIMARU (in Hindi *bimaru* means sick). In international literature, the Kerala model of demographic transition has received considerable attention. The same is not true of Tamil Nadu which is a much larger state than Kerala, in both area and population. The factors which have contributed to the significant reduction in the birth rate in Tamil Nadu are different from those operating in Kerala. Leaving aside the tiny State of Goa, which has the lowest birth rate in India, Kerala and Tamil Nadu are success stories in the field of population control. As a matter of fact, all the southern states, Kerala, Tamil Nadu, Andhra Pradesh and Karnataka are doing well in family planning, whereas the four large states in the North, Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan, are lagging far behind. As a result, a peculiar situation has arisen in India in terms of what we call 'North-South Demographic Divide'. It is rather unfortunate that India which claims to be the first country in the world to have formulated a State-sponsored population control policy is lagging far behind other Asian countries like China, Japan, South Korea, Taiwan, Singapore, Hong Kong, Thailand and even Muslim Indonesia. Jawaharlal Nehru, the first Prime Minister of India and the first Chairman of the Planning Commission, knew the feelings of the people and he very rightly put family planning under the rubric of health, with the focus on the health of the mother and child. In Nehru's concept, health included family planning. It is most unfortunate that under the influence of misguided foreign donor agencies, there was a paradigm shift in this policy from 1966 onwards and a new Department of Family Planning was carved out of the Ministry of Health with an elaborate system of 'targets', compensation money and incentives. A large number of foreign experts were involved who

relied heavily on contraceptive technology. Even though the money put in by these foreign donor agencies was not considerable, their effect on ideas was far-reaching. The family planning program in the 1960s was heavily dominated by foreign ideas and foreign experts. The system of targets led to widespread falsification of data at the grassroots level and the system of paying monetary incentives to guest doctors, motivators and clients led to commercialization of the program which in turn led to widespread corruption. To make matters worse, the entry of an extra-constitutional authority (Sanjay Gandhi) during the Emergency led to a perverse family planning program, based on undue governmental pressure and coercion. The Indian masses hit back during the general elections in 1977 and the Government of Indira Gandhi was thrown out of power. In the largest State of Uttar Pradesh, with 85 seats in Parliament, the ruling party (Congress I) could not get a single seat, such was the fury of the masses. Great damage was done to the family planning program by foreign ideas and the pressure tactics of Sanjay Gandhi. One may take the charitable view that the foreign experts as well as Sanjay Gandhi wanted to solve India's population problem speedily. Unfortunately, their ignorance of social reality was appalling.

The Registrar General's latest estimates (1993) of birth and death rates confirm our diagnosis of India's population problem in terms of the North-South Divide (see Table 1).

Table 1
Birth and death rates, 1993 (per thousand)

	Birth Rate	Death Rate	Natural Growth Rate	Infant Mortality Rate
INDIA	28.7	9.3	19.4	74
Kerala	17.4	6.0	11.4	13
Tamil Nadu	19.5	8.2	11.3	56
Andhra Pradesh	24.3	8.6	15.7	64
Karnataka	25.5	8	17.5	67
Bihar	32.0	10.6	21.4	70
Rajasthan	34.0	9.1	24.9	82
Madhya Pradesh	34.9	12.6	22.3	106
Uttar Pradesh	36.2	11.6	24.6	94

Source: Registrar General, India 1995.

It will be seen that the natural growth rate of population is lowest in Tamil Nadu (1.13 per cent) though the birth rate is lowest in Kerala (17.4 per thousand). The growth rate is highest in Rajasthan (2.49 per cent) though the birth rate is highest in Uttar Pradesh (39.2 per thousand). The death rate is lowest in Kerala (6 per thousand) and highest in Madhya Pradesh (12.6 per thousand). So also the infant mortality rate; it is as low as 13 per thousand live births in Kerala and as high as 106 in Madhya Pradesh; the highest infant mortality rate is in Orissa, 110 per thousand; 115 in rural Orissa. The tiny state of Goa has the lowest birth rate in India, 14.7 per thousand, and its death rate is 6.7 per thousand; thus the natural growth rate is only 0.8 per cent, much below the replacement level of population. The Union Territory of Chandigarh has the lowest death rate, 2.7 per thousand. Among the states, the death rate in Nagaland is only 4.7 per thousand followed by Manipur where it is 4.8. Underenumeration in these remote states and also sampling error may have contributed to the low death rate. Nevertheless, it is also necessary to study the food habits, physical environment and socio-cultural factors which contribute to the low death rate in these small states. The three-year moving average for infant mortality rate for Nagaland is only 7 per thousand for the period 1991-93, as estimated by the Registrar General. The comparable figure for Uttar Pradesh is 73 per thousand.

The National Family Health Survey (1992-93) initiated by the Ministry of Health and Family Welfare and funded by USAID collected useful demographic data through a large-scale sample survey. The results confirm our analysis of India's population problem (see Table 2).

Table 2
Demographic indicators (NFHS, 1992-93)

	% of illiterate females (age 6+)	% of girls, attending school (age 6-14)	Birth Rate (per 1000)	Total fertility (per woman)	% of women using contraception
INDIA	56.7	58.9	28.7	3.39	40.6
Bihar	71.4	38.3	32.1	4.0	23.1
Madhya Pradesh	65.7	54.8	31.6	3.9	36.5
Rajasthan	74.6	40.6	27	3.63	31.8
Uttar Pradesh	68.5	48.2	35.9	4.82	19.8
Kerala	17.6	94.8	19.6	2.0	63.3
Tamil Nadu	43.9	78.7	23.5	2.48	49.8
Andhra Pradesh	61.5	54.8	24.2	2.59	47.0
Karnataka	53.5	64.4	25.9	2.85	49.1

Source: IIPS 1995.

It will be observed that in the BIMARU states, the total fertility rate (TFR) ranges from 3.6 to 4.8 while in the southern states, it ranges from 2.0 to 2.9. The lowest practice of contraception is in Uttar Pradesh (19.8 per cent) apart from the small state of Nagaland where it is only 13 per cent; the highest is in Kerala (63.3 per cent).

The illiteracy rate among females is the lowest in Kerala (17.6 per cent) and the highest in Rajasthan (74.6 per cent). The southern state of Andhra Pradesh does not fare well when one considers the percentage of girls in the age group 6-14 years going to school. While the lowest figure is for Bihar (38.3 per cent), both in Madhya Pradesh and Andhra Pradesh, only 54.8 per cent of the girls go to school, compared to 94.8 per cent in Kerala. In this sense, Andhra Pradesh is a 'BIMARU' state in the South (to use our acronym for a 'sick' state). Interestingly, the TFR in Andhra Pradesh is low (2.6) compared to Madhya Pradesh (3.9). Of late, Andhra Pradesh has attracted the attention of demographers used to the Kerala and Tamil Nadu models. What explains the low fertility pattern of this state which is weak in terms of literacy and education? Is it the impact of films and the large number of cinema halls in this state? NFHS did not collect data on exposure to cinema but the state reports do contain data on percentage of married women who have heard a family planning message on the radio or television and also the percentage of 'both husband and wife' who approve family planning.

Table 3 underlines the complexity of demographic analysis:

Table 3
Exposure to family planning messages

	Heard FP message on radio/TV	Both husband and wife approve of FP
INDIA	42.2	58.4

Andhra Pradesh	58.4	77.1
Tamil Nadu	51.9	63.7
Karnataka	66.8	63.2
Kerala	55.9	62.6
Bihar	26.6	46.0
Madhya Pradesh	34.3	50.3
Rajasthan	33.3	59.1
Uttar Pradesh	32.7	42.3

Source: IIPS 1995:178

According to NFHS data, the percentage of both husband and wife approving family planning is the highest in Andhra Pradesh (higher than in Kerala and Tamil Nadu). This certainly must have contributed to the comparatively low birth rate of Andhra Pradesh. Nevertheless, it is necessary to explain why the couples in Andhra Pradesh are so highly motivated to practise family planning, also why in Haryana, where 79.4 per cent of husbands and wives approve of family planning, the birth rate is as high as 32.9 and the total fertility rate 3.99, almost the same as in Bihar.

Apart from qualitative differences in collection of NFHS data, socio-cultural factors affecting reproductive behaviour need to be examined. The small family norm has crystallized in Kerala and Tamil Nadu and possibly in Andhra Pradesh also but this is not so in the North where there is a marked 'son-preference' or what we call 'demographic fundamentalism', reflected in the cut-off point of two living sons before family planning is begun.

In the coming decades, there will be growing demographic disparity in India and like economic disparity, this should be a matter of serious concern for our planners and policy-makers. This demographic disparity leading to demographic imbalance may cause considerable social turbulence and may even pose a threat to political stability. Demographers must look far beyond demographic statistics and anticipate the consequences of such demographic imbalance between different regions and states in India as well as between different religious communities, castes and tribes.

A politically explosive situation may arise out of the differential growth rate of population belonging to different religious communities and caste groups. Table 4 gives the growth rates of population by different religious communities for the decade 1981-91:

Table 4
Decadal growth rate of different religious communities 1981-91

Religious community	Percentage decadal growth rate, 1981-91 ^a	Percentage of total population ^b
Buddhists	36.0	0.76
Muslims	32.8	12.12
Sikhs	25.5	1.94
Hindus	22.8	82
Christians	16.9	2.34
Jains	4.4	0.4

^a Excluding Jammu & Kashmir where the 1991 census was not held and Assam where the 1981 census was not held.

^b Excluding Jammu & Kashmir Source: Census of 1991, Paper 1 of 1995: Religion.

Interestingly the growth rate of Buddhists is the highest, because of the conversion of lower-caste Hindus to Buddhism as a protest against social inequity. The high growth rate of Muslims must be partly attributed to high fertility and partly to migration from Bangladesh and Pakistan, legal as well as illegal. The Christians have a comparatively low growth rate because of their low fertility. I am, however, not making a statistical point here but indicating the implications of different growth rates for the political environment.

With the growth of fundamentalism all over the world and also in India, religion is bound to be invoked in election campaigns and the agenda of political parties. The different growth rates of population of Hindus and Muslims is bound to have political repercussions: a demographic issue may be converted into a political issue. The ramifications of this problem must be understood. To a large extent, the high growth rate of Muslims is a reflection of their poverty and illiteracy. The growth rate of the Scheduled Castes population, which is poor, is also high. The population of Scheduled Castes in India (excluding Assam and Jammu and Kashmir) during 1981-91 was 31 per cent which is comparable to the figure for Muslims: 32.8 per cent. The Scheduled Tribes also belong to the poorer sections of the population. In their case, however, the growth rate during 1981-91 was 25.7 per cent which is much lower than that of the Scheduled Caste population. Obviously, apart from poverty, there are social and cultural factors which affect the fertility and mortality pattern and the growth rate.

Table 5 gives the decadal growth rate of the Scheduled Caste (SC), Scheduled Tribe (ST) and non-SC/ST population during 1981-91.

Table 5
Decadal growth rate of population by communities in India ^a

	1981-91 (per cent)
Total population	23.8
Scheduled Caste population	31.0
Scheduled Tribe population	25.7
Non-SC/ST population	22.1

^a Excluding Assam and Jammu & Kashmir Source: Census of India, 1991

It will be seen that both the Scheduled Castes and Scheduled Tribes populations have grown faster than the non-SC/ST population. These figures must be interpreted in the context of the growing demand for reservation of jobs for SCs, STs, Muslims and other backward communities (OBCs). The Constitution of India does safeguard the position of SCs and STs. There is, however, a growing demand to raise the proportion of jobs reserved for SCs and STs. Several years back, the Mandal Commission Report on this subject sparked off violent agitations and led to political instability. It is worth recalling that in the most populous states of UP and Bihar, the Chief Ministers belong to the weaker sections of the community. This ushers in a new era of the growing power of political leadership representing the weaker sections. Since employment opportunities are inadequate, the clamour for jobs has an element of conflict and violence; religion and caste are invoked to obtain jobs, often without any consideration for merit. The same is true of the students' admission policy in institutions of higher learning, particularly in medical and engineering colleges. This is another conflict point. Throughout the country, if the masses are asked what is India's number one problem, the answer is invariably 'Creating more jobs'. It is somewhat unfortunate that the family

planning program, ever since 1951, has failed to relate population growth to the growth of the labour force. A high rate of population growth for the last three decades has converted the population problem into a major unemployment problem. The voting age has been reduced to 18 years, and every person aged 18+, whether employed or not, is a voter. The mere size of population gives people a tremendous political leverage and the unemployed masses see their salvation in getting jobs in the government or organized sector.

In 1976, during the Emergency period, a National Population Policy was formulated by the government. This policy stated that for the purpose of deciding the number of seats in Parliament and State Assemblies, the 1971 Census population would decide the position of each state and this would remain so till the year 2001. In other words, the state of Uttar Pradesh will not have more members in Parliament because its population growth rate was higher than that of Tamil Nadu. Now there is every possibility that the whole issue will be reopened in 2001. The Expert Group on Population Policy headed by Dr. M.S. Swaminathan recommended in its 1994 report that this freeze should continue right up to the year 2011.

A crucial factor which affects family planning is literacy and in particular, female literacy; here disparities between North and South are very considerable. Within each state also there is much disparity between the literacy rate of the SC and ST population and the overall literacy rate. The disparity between the literacy rates of males and females is equally striking (see Tables 3 and 4).

Table 6
Literacy rate India, 1991 (per cent) (7+ population)

	Males	Females	Persons
INDIA ^a			
Total population	64.1	39.3	52.2
Scheduled Castes	49.9	23.8	37.4
Scheduled Tribes	40.7	18.2	29.6

^a Excluding Jammu & Kashmir

Source: Census of India, 1991

Table 7
Literacy rates, 1991 (per cent)

North	Males	Females	Persons
Uttar Pradesh			
Total population	55.7	25.3	41.6
Scheduled Castes	40.8	10.7	26.9
Scheduled Tribes	50.0	19.9	35.7
Bihar			
Total population	52.5	22.9	38.5
Scheduled Castes	30.6	7.1	19.5
Scheduled Tribes	38.4	14.8	26.8
Madhya Pradesh			
Total population	58.4	28.9	44.2
Scheduled Castes	50.5	18.1	35.1
Scheduled Tribes	32.2	10.7	21.5
Rajasthan			
Total population	55.0	20.4	38.6
Scheduled Castes	42.4	8.3	26.3
Scheduled Tribes	33.3	4.4	19.4
South			
Andhra Pradesh			
Total population	55.1	32.7	44.1
Scheduled Castes	41.9	20.9	31.6
Scheduled Tribes	25.3	8.7	17.2
Karnataka			
Total population	67.3	44.3	56.0
Scheduled Castes	49.7	26.0	38.1
Scheduled Tribes	48.0	23.6	36.0
Tamil Nadu			
Total population	73.8	51.3	62.7
Scheduled Castes	58.4	34.9	46.7
Scheduled Tribes	35.3	20.2	27.9
Kerala			
Total population	93.6	86.1	89.8
Scheduled Castes	85.2	74.3	79.7
Scheduled Tribes	63.4	51.1	57.2

Source: Census of India 1991

With regard to the practice of family planning, the findings of the National Family Health Survey conducted in 1992-93 are summarized in Table 8.

Table 8
TFR and Practice of FP, 1992-93

TFR (15-49)	Percentage of currently married women using contraception (any method)
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	Total	Rural	Urban	Total	Rural	Urban
North						
Uttar Pradesh	4.8	5.2	3.6	19.8	16.7	32.0
Bihar	4.0	4.2	3.3	23.1	19.8	42.5
Madhya Pradesh	3.9	4.1	3.3	36.5	33.4	47.7
Rajasthan	3.6	3.9	2.8	31.8	28.2	47.1
South						
Tamil Nadu	2.5	2.5	2.4	49.8	49.2	50.9
Andhra Pradesh	2.6	2.7	2.4	47.0	43.6	56.6
Karnataka	2.9	3.1	2.4	49.1	47.7	52.0
Kerala	2.0	2.1	1.8	63.3	61.4	68.2
India	3.4	3.7	2.7	40.6	36.9	51.0

Source: IIPS 1995:27-29; 47-49.

In the northern states, total fertility rates are well above the national average while in the south, they are much below the national average. In Uttar Pradesh the rural TFR is as high as 5.2; the urban TFR is 3.6, while the urban TFR of Kerala is 1.8. What is the effect, if any, of urbanization, in Uttar Pradesh? Likewise, in the urban areas of UP only 32 per cent practise family planning compared to Kerala's urban figure of 68 per cent.

Perhaps literacy gives a clue to the differences between the North and South. In an environment of literacy such as in Kerala, even the illiterates tend to behave like the literates (see Table 9).

In Kerala, the practice of family planning is higher among the illiterates than among those with schooling. Since the family planning program is centred round sterilization, the logistics and the human settlement pattern in Kerala seem to have contributed to this phenomenon. But this is not true of any of the northern states.

Disparities between the states are indeed striking. For historical and political reasons, the reorganization of the states was done on a linguistic basis from 1956 onwards. In the size and population of the 25 states, India is a picture of demographic anarchy: one state (Uttar Pradesh) has a population of 119 million while another (Sikkim) has only 406,000. Because of the growing demand for regional autonomy by tribal communities, there are as many as seven states in north-east India. The tiny state of Mizoram has the second highest literacy rate in India, 82.3 per cent; according to NFHS the total fertility rate in Mizoram is 2.3. In the neighbouring tribal state of Meghalaya, the TFR is 3.7. No demographic pattern emerges even in the tribal-dominated states of north-east India.

Table 9
Percentage of currently married women using any contraceptive method by literacy and education

State	Illiterate	Primary School complete	Middle School complete	High School complete
North				
U.P.	27.9	28.5	29.5	40.4
Bihar	31.2	42.2	42.4	45.6
M.P.	33.6	44.2	42.7	49.1

Rajasthan	29.1	42.6	42.9	46.9
South				
Tamil Nadu	52.4	51.4	52.6	52.3
Andhra Pradesh	43.5	60.1	55.3	52.2
Karnataka	45.5	52.5	52.8	56.9
Kerala	66.7	60.5	60.4	62.9
INDIA	33.9	49.3	50.8	54.6

Source: IIPS 1995:55.

In the small hilly state of Himachal Pradesh in north-west India, because of the difficult terrain, access to health and education is a problem. Yet in literacy Himachal Pradesh has a better record than the two most prosperous states of Punjab and Haryana, and the practice of family planning is better in this state than in the neighbouring states. In fact, Himachal Pradesh may be regarded as a more successful state than Kerala. It is not industrialization and urbanization which have made Himachal Pradesh a demographically progressive state, but the realization of its people that the land cannot sustain them and therefore, salvation lies in migration. The people also know that without a minimum level of schooling, the chances of getting jobs are dismal. This has led to higher school enrolment rates, a higher age at marriage and a higher level of practice of family planning. Since the men migrate, leaving behind their families in the villages, women have to fend for themselves, look after the land, and cattle, and also take care of the elderly members of the family as well as the children. The women in the hills are hardy and self-reliant. Also, successive governments in Himachal Pradesh have met some of the basic needs of the people like drinking water and electricity even in remote villages. The combination of ecological factors, fulfilment of basic needs and the initiatives of the people makes Himachal Pradesh an interesting case for testing the theory of demographic transition.

The clamour for reservation of jobs for the Scheduled Castes, Scheduled Tribes, other backward classes (OBCs) as well as for Muslims and other minorities will increase in the absence of adequate employment opportunities in the organized sector; the vast poverty-based unorganized sector may increase and unless an attack is made on poverty and the basic needs of the people are met, no family planning program will succeed. International lobbies are putting great faith in figures for the 'unmet demand' for contraceptives, social marketing, developing an international market for contraceptives, etc. All this will not work if the literacy levels in India remain shockingly low and the basic needs of the people remain unfulfilled. The concern for curbing the birth rate should not be limited to the issue of unmet demand for contraceptives. What about the unmet demand for safe drinking water which has been an election promise of all political parties for the last several decades? There is certainly very great scope for making a quantum jump in India's mismanaged family planning program. What we need is a paradigm shift in our perception of the population problem.

Appendix Table 1 presents probable total fertility rates for the year 2001, based on purely mechanical projections by K. Natarajan of the Office of the Registrar General, India. The role of the BIMARU states is indeed depressing. The need for a paradigm change in population policy is, therefore, urgent.

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Appendix Table 1

Likely levels of TFR in 2001			
State	TFR 1991 (SRS)	2001 (Projected)	Date by which TFR is likely to be 2.1
1. Andhra Pradesh	3.0	2.4	2001-06
2. Assam	3.5	2.7	2006-11
3. Bihar	4.4	4.1	2021-26
4. Gujarat	3.1	2.0	1996-01
5. Haryana	4.0	2.5	2001-06
6. Karnataka	3.1	2.8	2016-21
7. Kerala	1.8	0.6	1990
8. Madhya Pradesh	4.6	3.9	2026-31
9. Maharashtra	3.0	2.7	2011-16
10. Orissa	3.3	3.1	2016-21
11. Punjab	3.1	1.9	1996-01
12. Rajasthan	4.6	4.3	2041-46
13. Tamil Nadu	2.2	1.4	1991-96
14. Uttar Pradesh	5.1	4.4	2026-31
15. West Bengal	3.2	2.2	2001-06
India (weighted average)		3.1	

Source: Natarajan 1993.

Women's education and the demographic transition in Africa



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The theory of demographic transition evolved originally as an attempt to explain the demographic evolution in Western countries. The theory was not very specific about the role of factors underlying the passage from high levels of fertility and mortality to low fertility and mortality but, as Notestein (1953) pointed out in his seminal paper, the transition involved a complex process proceeding concurrently at various levels: social, cultural, economic and biological.

Amongst the socio-economic variables, one has been identified in almost all societies as characteristic of the demographic transition: parental education, and in particular the education of women. The educational level of brides has been demonstrated to be associated with their average first marriage age (UN 1983). Family size preferences and the use of birth control are associated with the education of both women and their husbands. Parental education has been closely related to the chances of child survival (Gille 1987). Although the findings vary in detail, partly owing to model specifications and the statistical approach used in individual studies, partly because of societal and cultural influences on the underlying relationships, there is no doubt that educational differences are significant in the demographic process.

Even low levels of schooling apparently suffice to contribute towards a demographic transition, though it is debatable whether the effect arises from changes in attitudes or because education furnishes people with new knowledge. Some demographers assert that given the poor quality of schools and teachers, especially in the rural areas of many developing countries, it is unlikely that a few years of primary schooling can provide the scientific information needed, for example, to alter personal health practices. Yet it appears that even a few years of a mother's school attendance furnish a positive relationship with her child's survival chances, and that this relationship holds good not only in countries with easily accessible effective health services, but also in those where the primary health care system is underdeveloped (Cleland and van Ginneken 1988; LeVine et al. 1994). Another possible avenue through which schooling and literacy acquired in childhood may affect later behaviour is through change in the way people see themselves and how they are perceived by others (Caldwell and Caldwell 1985). The first generation of mothers with education, whose parents made the revolutionary decision to send them to school, may be in the vanguard of a wider and more complex process in the transformation of the attitudes of whole communities, not only of individuals (Ewbank 1994).

There is another aspect of the effect of education on fertility: the effect of a child's opportunity to go to school on the parental assessment of the value of children. In his theory of fertility decline Caldwell (1982) developed a concept of intergenerational wealth flows which, *inter alia*, considers this aspect of the educational impact on fertility: the increasing costs of child-rearing and reduced availability of children's labour to supplement family income (Cleland and Wilson 1987).

The mechanisms through which educational differences affect the proximate variables and the ultimate outcome — postponement of marriage, reduced family size, improved child survival — remain unclear. Reviewing the discussion on how parental education affects child survival in contemporary developing countries, Caldwell (1994:224) noted that the mechanism whereby education is translated into improved life expectation for the child is far from demonstrated: ‘it is still hard to avoid the conclusion that the full exploration of the mechanisms, with the obtaining of clinching proof, has hardly begun’. The pathways through which education influences declines in fertility are even less explored, although the inverse relationship has been found in the demographic transition of many developed countries and observed in almost every developing country of Asia and Latin America. However, some countries of sub-Saharan Africa, which lag behind other developing countries especially in the fertility transition, appear to be an exception. It emerged, for instance, from the national rounds of the World Fertility Survey that most sub-Saharan countries portrayed a pronatalist culture with desired family size ranging between six and eight children (Okojie 1992). The levels of fertility continue to be comparatively high despite impressive expansion in women’s education, decline in infant and child mortality,

Table 1
Percentage distribution of married women by education in selected African countries

Age	Years of schooling			
	0	1-3	4-6	7+
NIGERIA				
15-19	70.4	3.7	19.6	6.3
20-24	63.6	7.7	18.4	10.3
25-29	72.2	6.5	14.9	6.4
30-34	78.6	5.9	11.4	4.1
35-39	82.8	5.3	9.0	2.8
40-44	88.7	4.6	5.1	1.6
45-49	92.7	3.1	3.6	0.7
GHANA				
15-19	48.0	5.3	8.3	38.8
20-24	37.2	3.9	9.3	49.6
25-29	46.3	3.4	9.6	40.7
30-34	64.0	3.5	9.4	23.2
35-39	75.9	2.4	8.4	13.3
40-44	79.4	2.7	8.6	9.3
45-49	87.6	2.1	2.5	7.8
CAMEROON				
15-19	40.1	9.2	38.9	11.8
20-24	35.4	9.5	41.2	13.9
25-29	50.2	8.9	29.7	11.3
30-34	71.1	5.2	18.1	5.6
35-39	79.8	6.4	10.7	3.2
40-44	88.6	5.4	4.4	1.6
45-49	92.0	4.9	2.6	0.5

Source: World Fertility Survey data reported in Chimere-Dan (1993) and fairly rapid urbanization. What changes in fertility did occur there were largely the result of later marriage (Bailey and Serow 1991). On the other hand, in sub-Saharan Africa as in

other developing countries, mother's education markedly increases her children's chances of survival (UN 1985; Cleland and van Ginneken 1988).

Education reached women in many developing countries, including the countries of sub-Saharan Africa, comparatively recently. Demographic surveys and censuses taken in the early 1980s suggest that very small proportions of women aged 30 or 35 and over had primary education or were literate.

In the attempt to understand how the attitude toward sending girls to school, both of parents and the community at large, has changed and how these changes bring about a transformation of family formation and reproductive behaviour, we have turned to an unconventional source of information: the novel, together with a small sample of autobiographies. The approach has a precedent in *Victorian Families in Fact and Fiction* by Kane (1994). There she examined nineteenth-century literature, diaries and memoirs in an attempt to identify attitudes and behaviour which might have influenced the course of the demographic transition in Britain. Here we undertake similar examination using a sample of modern African writing from the Heinemann African Writers Series.

The use of such source materials has its limitations, and some of these are discussed in detail elsewhere (Kane 1994). Others relate specifically to the sample presented here. While a third of the books represented were originally published elsewhere, the rest received their first publication in the Heinemann African Writers Series. Even more than those which were reprinted in the Series, they therefore reflect the selection criteria of its editorial adviser, Chinua Achebe. It can be said, however, that Heinemann was amongst the first major publishers to promote African literature, and cast its net fairly widely in the effort to do so. Of those books first published elsewhere, all but a couple came from European, rather than African, publishing houses: in other words they were not written simply for a local market. In addition, all the books were written in English or French rather than in an African language. It was and remains the case that many African writers prefer to avoid local languages which imply a limited audience even within a single African country; nevertheless the use of English or French does confirm the fact that their work is that of a highly educated elite, and designed to appeal beyond the boundaries of their own societies. Despite these caveats, the evidence from these works is largely consistent, and suggests some remarkable similarities, as well as differences, amongst those influences on fertility and mortality change.

Descriptions of education in Victorian Britain suggest that it was of rather poor quality. Whether children learned in the village school, or even at expensive private establishments, they were unlikely to have acquired logical thought or reasoning. Certainly their schooling was not designed to encourage them to question established customs or to express individuality.

Those Africans first exposed to Western education seem to have received a similarly limited curriculum. Schools were 'poorly equipped, poorly housed and [had] limited aids' (Ngugi 1975). The syllabus offered by missionaries to the Shona before the 1930s seems to have been fairly typical. Children learned reading and writing and 'skilled trades such as carpentry, stonemasonry, bricklaying, shoe-making, blacksmithing and horticulture, while the Dominican nuns taught domestic science and child care' (Vambe 1972). Those who boarded were expected to be self-supporting: Odinga (1974) says of one school he attended that the children had to grind corn, cook their own meals, and go about three miles for water. At his next school he worked as a servant to one of the white teachers as well as, along with the other boys, cultivating a garden plot.

Moreover, 'appropriate' behaviour often seemed to be of greater importance than what the children learned. Ngugi (1977) describes Kenyan children in colonial times being lined up each day to salute the British flag. Peters (1971) writes of a prefect at the school gates,

assigned to check that the children wear shoes; without them they cannot attend. 'Those were the days when shoes had replaced books in importance'.

As in nineteenth century Britain, the teachers, recruited from former pupils of such establishments, were often of limited education themselves. Kenyatta (1979) noted their poor quality in Kenya, quoting from a 1937 report on higher education in East Africa that only a third of European women missionaries in Uganda had any professional training as teachers.

Even at the European school with the highest prestige in Kenya in the late 1950s, education left much to be desired. School atlases dated from 1904; pre-First World War geography texts still spoke of German East Africa. But there was a large and magnificent chapel, consecrated by the Archbishop of Canterbury, whose niece had been headmistress at the time.

In later years, when educational standards had improved, the syllabus remained far from relevant. Ngugi (1977) described a strike at a Kenyan secondary school where the boys were lectured in

scouting, England, Cambridge and the history of the world from Celtic times to the birth of the new nations in Africa and Asia... We wanted to be taught African literature, African history, for we wanted to know ourselves better. Why should ourselves be reflected in white snows, spring flowers fluttering on icy lakes?

Another boy, from the same 'good' school, pitied a friend who had only been to a Gikuyu school, now burned by the British for sedition. When his friend talked of Chaka and other African heroes

I wanted to tell him about the true and correct history: the Celts, the Anglo-Saxons, the Danes and Vikings, William the Conqueror, Drake, Hawkins, Wilberforce, Nelson, Napoleon and all these real heroes of history. But then I thought he would not understand secondary school history... (Ngugi 1975).

The same author also suggested that, post-Independence, education in village schools deteriorated, as the best African teachers were creamed off into what had been Asian and European schools.

From such accounts, it seems unlikely that schooling offered many Africans an extensive scientific perspective, or significant intellectual resources, any more than it had offered a new world view to Victorian children in England.

In addition, missionaries provided most of the African schools, as the clergy had organized many of the schools in England, and religious education is a prominent feature of descriptions of both. Without exception, African writers saw religion and education as being intertwined: 'From the very beginning, religion and education went hand-in-hand' (Achebe 1964). In Britain, however, religious teaching upheld and attempted to reinforce existing societal values. In Africa, Christianity was seen as presenting explicit challenges to them.

One such challenge was the emphasis on the individual; upon personal development and personal salvation. Kenyatta (1979) argued that Gikuyu education was concerned with social and personal relationships, training

in beliefs and customs necessary to the self-maintenance of the tribe and interrelation with the neighbouring tribes...European educationalists have not realised the importance of this teaching, and the result has been that the children who have been taught under European influence have almost forgotten or disregarded the Gikuyu customary law of behaviour.

Customary laws of behaviour, however, were often at variance with Christian doctrines. Polygamy, premarital sex and circumcision were particularly contentious issues frequently mentioned by African writers. While Christianity stood, in Europe, for the traditional establishment and radical Victorians frequently challenged it, the Church itself was, in Africa,

the radical alternative. African Christianity implied non-conformity and innovation, and set parent against child, elders against converts and the old ways against change.

The new converts were full of zeal; they came to believe that what was in their people was evil. Every custom was a sin. Every belief held by the people was called superstition, the work of the Devil...Christ was on their side, so they went through the hills, treading on the sacred places and throwing away the meat that had been sacrificed to Ngai under the Mugumo (Ngugi 1975).

Many parents were reluctant to send their children to school, for that reason amongst others.

In the beginning, only orphans, foster children, poor nieces and nephews and never the favourite sons were sent, for the villagers distrusted the pressure on them to send their children out of the home and away from herding the animals; and the more alert objected to the way the Christian missions taught... for they could see that the children at the mission would grow up to despise Luo ways (Odinga 1974).

Education went even further than erecting a new religion and challenging customary ways. The entire belief-system of African societies and the relationship of people to the world around them were undermined by

the fatal meeting between the native and the alien....The native was grazing cattle, dreaming of warriorship, of making the soil yield to the power of his hands, slowly through a mixture of magic and work bending nature's laws to his intentions. In the evening he would dance...in celebration or he would pray and sacrifice to propitiate nature. Yes: the native was still afraid of nature (Ngugi 1977).

In Victorian Britain, too, attempts to propitiate nature by ritual and magic had been undermined by the growth of knowledge about the causes of sickness and other calamities. Contemporary writers suggested that the spread of schooling played a powerful role in the reduction of superstition and the inculcation of basic principles of hygiene, which in turn led to reductions in mortality. Such a connection is explicit in one Yoruba novel (Aluko 1971). Joshua thinks the village church school is a childish institution 'where teachers taught the children to do silly things like physical training, and to believe sillier things yet, like guineaworm and dysentery being caused by drinking water from brooks'. He does not want to send another son to school: 'who will fetch the water for me on the farm? Who will make the fire for roasting the yams?' But his son dreams of a future in which

pupils teach their parents what Teacher teaches them at school - that guineaworm comes of bad water and tapeworm of bad meat, that dirt is the great enemy in the house and that cleanliness is of God and is next to godliness...

As colonialism established its grip, however, education came to be seen as an essential strategy for acquiring, or countering, the power of the white man. Indeed, education was 'the White Man's magic' (Aluko 1971).

Schools grew up like mushrooms. Often a school was nothing more than a shed hurriedly thatched with grass. And there they stood, symbols of people's thirst for the white man's secret magic and power. Few wanted to live the white man's way, but all wanted this thing, this magic (Ngugi 1970).

By the 1920s, Odinga (1967) described anti-colonialist rallies as including, among their demands, 'We want better education'.

In the Cameroons, villagers beg to know what their only scholar member has learned, even if they will not understand it:

Tell us all the same....For us, you are the white man - you are the only person who can explain these mysteries to us. If you refuse, we've probably lost our only chance of ever being able to learn the white man's wisdom (Beti 1972).

Achebe (1970) described Ezeulu, worried by the coming of Europeans, sending a son to a church school to be his 'eyes'. Within a short time, increasing European intervention

reinforced the view which had been gaining ground that the best way to deal with the white man was to have a few people ...around who knew what the white men knew. As a result many people - some of them very important - began to send their children to school. Even Nwaka sent a son - the one who seemed least likely among his children to become a good farmer (Achebe 1963).

A later generation of Ezeulu's people formed a Union 'with the aim of collecting money to send some of their brighter young men to study in England' (Achebe 1963).

Nwaka, the conservative, was torn between the need to acquire an educated and hence powerful family member and his more immediate need for help on the farm; hence his decision to send the least useful son to school. Aluko's (1971) Joshua had, as we saw earlier, made a similar decision to spread his options, educating one son but not another because then who would fetch the water or roast the yams? The immediate opportunity cost to the parents of schooling was also noted in Victorian English literature.

The desire to learn the white man's wisdom or magic in order to stand up to him is not dissimilar from the desire of the Victorian working class for an education which would enable them to challenge their traditional rulers. The nineteenth century elite found the political clubs and literary institutes which grew up among the newly-literate profoundly threatening; Odinga (1974) claimed that 'the government was initially suspicious of mission schools for encouraging people to model themselves on the whites - become jumped-up Englishmen'. Indeed, *Victorian Families in Fact and Fiction* recognized that similar fears operated in both cases: fears of a challenge to the *status quo* of power.

After the failure of the Shona rising of 1896 in Zimbabwe, the people lost faith in the ancestors upon whose power and goodwill they had relied for victory. So most parents

encouraged their sons and daughters not only to be baptised but also to attend school at the Mission. The children responded beyond the wildest expectation of the Jesuit fathers. The classrooms and the Church filled up with young people of both sexes, who were willing to make a break with their tribal past in order to attain the bright new world which Christianity held out to them (Vambe 1972).

The bright new world offered amazing possibilities. Both adults and children of Achebe's Umuofia enrolled in the school which Mr Brown built (together with a little hospital) after he persuaded them that without education, outsiders would come to rule them.

It was not long before the people began to say that the white man's medicine was quick in working. Mr Brown's school produced quick results. A few months in it were enough to make one a court messenger or even a court clerk. Those who stayed longer became teachers; and from Umuofia labourers went forth into the Lord's vineyard... (Achebe 1964).

But for those who did go on to further education, the sky was the limit. A young man dreamt of 'a world that would soon be mine. With a degree in Economics and Commerce, any job in most firms was within my grasp. Houses...cars...shares...land in the settled areas...' (Ngugi 1975).

A university degree was the philosopher's stone. It transmuted a third-class clerk on one hundred and fifty a year into a senior Civil Servant on five hundred and seventy, with car

and luxuriously furnished quarters at nominal rent. And the disparity in salary and amenities did not tell even half the story. To occupy a 'European' post was second only to actually being a European. It raised a man from the masses to the elite... (Achebe 1963).

In Victorian Britain, education seems very often to have been linked with the scientific mastery of nature through a range of trades and professions. African writers much more frequently describe it as a path to Government service. As a young Tanzanian character remarks, 'Why, even new-born babies are government officers...' (Palangyo 1970). In part, such a difference may simply reflect the international growth of bureaucracy, and of government or quasi-government control over many aspects of industry in a planned economy. Nevertheless, the contrast is striking. Only one character, Wanja's first boyfriend, sounds like a hero in a Victorian novel:

He talked about Uhuru. He said there would be increased chances, especially for poor people. Therefore he was going to work very hard: go to a secondary school... university... engineering. Yes, he was going to be an engineer... his ambition was to build a bridge over a road or over a river.....It felt good (Ngugi 1977).

Concentration on Government service — and teaching — may explain another divergence from the nineteenth century British pattern. In Victorian England, education was seen as offering social advance. However, the Victorians were very conscious that social mobility was a two-way process: people were almost as likely to fall as to rise. African writers, however, have seen education as a guarantee of permanent advancement in security, comfort and status; though unemployment may have changed the perspective amongst today's writers. As such a guarantee, education may have been a factor in deferring a fertility transition. Whereas in Victorian England, such advancement was precarious and the gains could be threatened by a large and demanding family, African confidence in a secure Government post implied no similar considerations.

The gulf between those with, and those without, education is stark.

When Gaciru... failed her CPE at the village school, there was nothing else for her except to join her mother in carrying out the day-to-day drudgery that was the common feature of village life.... She felt bitter that many fools had managed to climb up the ladder that took one to that bridge which separated the green pastures from the rest of the land...Her life in her mother's hut was not happy, either. The old woman was too possessive and did not seem to value what Gaciru had learned at school. Many times Gaciru wanted to put into practice some of the things she had learned to do in her domestic science classes but her mother would not let her (Njau 1978).

As an educational failure, Gaciru did not have the credibility to challenge her mother's ways.

Those who had an education acquired a status outside the boundaries of traditional society. Even Aluko's Joshua, whom we saw believed school a childish institution, thought that 'the teacher's great learning had put him on a considerably higher plane than the village folk' (Aluko 1971). Mezda despite failing his baccalaureate is welcomed back to his family village as a man who has been at school since he was a child, and 'Today he sits on the same benches as the sons of white men'. As a result, he is feted and given tributes of animals. He is even given a wife, although 'in the village, economics, law and tradition gave benefits to age — As a result, in Kala a woman is an infallible sign of male prosperity' (Beti 1972).

Besides social mobility, education implied physical mobility. Those who progressed from primary school had to leave home.

They formed a miserable floating population, these kids: lodged with distant relatives who happened to live near the school, underfed, scrawny, bullied all day by ignorant monitors. The books in front of them presented a universe which had nothing in common

with the one they knew: they battled endlessly with the unknown, astonished and desperate and terrified (Beti 1972).

Those who survived often became alienated from their families and homes, like Hassan, whose

father had, for him, been like someone already dead - ever since the day he had sent him away to the English school in Maadi sometime after his mother's death....During the time away from him spent with foreign tutors his childhood quickly died, his love for his father froze, and he became a sophisticated man not greatly concerned with the emotions, subordinating everything to rational standards ...Today, after the death of his father, his link with the rest of his relations would no doubt be cut and he would remain without roots (Rifaat 1983).

In any event, the careers which education offered took them far away from their villages and offered them a new urban environment, as had also happened in Victorian Britain. Far away from parents or other traditional sources of social pressures to conform, individuals could experiment with new behaviour. Western education promised 'a freedom which tribal Chishawasha did not allow; it offered them a chance to realise their unfulfilled hopes' (Vambe 1972). Among other things, the status and mobility of education undermined the authority of parents and elders.

Of all her family she was the only one who had completed her 'O' levels, and she never failed to rub in this fact. She walked around with her nose in the air; illiterate relatives were beneath her greeting... her mother seemed bemused by her education. At her own home Neo was waited on hand and foot... (Head 1983).

A young man about to leave his village for university fears his father 'though sometimes he wondered why he feared him. He ought to have rebelled like the other educated young men'. Like Mezda, incidentally, he is seen as a great marriage prospect (Ngugi 1975). A young woman who goes to work in Lagos under the care of her aunt marries secretly and her aunt is deeply offended.

It is a slight and nothing else. What do I know? I didn't go to school. If I had gone to school, you would not have treated me in this way (Nwapa 1983).

In general, girls had less access to the coveted status and opportunity which education provided. Wanja the barmaid in *Petals of Blood* (Ngugi 1977) says

boys were always more confident about the future than us girls. It was as if we knew that no matter what efforts we put into our own studies, our road led to the kitchen and the bedroom.

Seduction and pregnancy made Wanja a school dropout.

A similar possibility made Dehinwa's father reluctant to invest in her education, even though he had sent all his sons abroad to complete their schooling: 'He said he wasn't sending any girl to England only to go and get herself pregnant within three months' (Soyinka 1972).

But lack of education might make a girl less attractive as a marriage prospect amongst the new elite. John the prospective university student does not want to marry his pregnant lover Wamuhu because — besides being unacceptable to his parents — she comes of a traditional family, is circumcised and only reached Standard IV. Nevertheless,

there was none who could equal her and no girl in the village had any pretence to any higher standard of education. Women's education was very low. Perhaps that was why so many Africans went 'away' and came back married.

Some were ambivalent about the advantages of educating girls. Theresa and Ntanya fall in love and decide to get married and till the land. 'We won't get rich but we won't starve. We'll raise a family and send our children to school'. But she tells Ntanya's friend James, an educated ex-Government official,

my next assignment is to get you a good girl, a healthy girl from Kachawanga, not these school urchins that you educated men talk about... but a girl who can fling a hoe from sunrise to sunset... (Palangyo 1970).

Marriage, in every account, revolves around children. Indeed, it always had. Vambe's aunt Josephine became pregnant while married under tribal law, but not yet in church. His grandmother was delighted: what would have happened had they been married as Christians and one turned out to be incapable of producing children?

What grandmother was saying was simply this: among our people the birth of a child was the only binding factor in a marriage, almost the only reason for getting married at all (Vambe 1972).

But not everybody who gets pregnant is in a position to marry. In addition to Ngugi's schoolgirl Wanja, many other have abortions. For example, Obi, the young Nigerian whose overseas education was paid for by local subscription, is forbidden to marry his girlfriend because she comes from a taboo family; she has an abortion from which she almost dies.

Occasionally, adoption is an alternative, as it is for Ruheni's Jane. This young woman then begins to use the Pill, but the doctor has told her it may interfere with her blood pressure. 'Every time I swallow one I feel my heart beating hard. You are correct, Doctor, these pills interfere with the heart'. She gives them up. Meanwhile, others in her circle are about to marry:

'Eunice, do you know what will happen next Saturday?'

'I will become your wife. You will become my husband'.

'Are we all set for it?'

'Yes'.

'No. Have you thrown away all your pills?'

'Oh dear, oh dear'.

She delved into her handbag and pulled them out. She threw them on the charcoal burner. They burned rather reluctantly... (Ruheni 1975).

The association between contraception and the unmarried is also reflected by Mrs Faseyi, a spirited old woman, who asks one of her son's friends if he is married.

'No'.

'But you have children perhaps?'

'None'.

'Well, you needn't look so virtuous. You probably knew what to do. Too many young men don't or they simply don't care' (Soyinka 1972).

In nineteenth century Britain, too, references to birth control are usually associated with premarital or extra-marital sex, and *Victorian Families in Fact and Fiction* suggested that the connotations of immorality were among the reasons for the slow acceptance of contraception

in the wider community. It was also suggested that radical advocates of birth control were unlikely to appeal to a newly-expanded and respectable middle-class. In addition, early advocates of birth control were often extremely critical of every method except their own preferred choice; the plethora of adverse comments about the various contraceptives might well have influenced potential users.

Rather similar factors may have retarded the spread of birth control in Africa. For traditionalists, the connection with immorality would have intensified the fear of a further foreign contribution to the decline in tribal behaviour. Christian-educated Africans would have imbibed church attitudes to contraception which varied from complete hostility in Catholics to discreet endorsement by the Methodists. It was not until 1958 that the Church of England gave unequivocal support to family planning (Leathard 1980). In a period of anti-colonialist nation-building, practices advocated by foreigners and a few foreign-educated doctors were unlikely to be any more acceptable to the average African than the messages of Francis Place would have been to Mr Pooter (Kane 1994). Widespread publicity about possible ill-effects of particular contraceptives may well have deterred many women from using any method.

One powerful short story, by the Egyptian–Lebanese writer Chedid (1983) does imply that there is a limit to the number of children who may be welcome even within marriage. The desperately poor mother of nine children feeds the wandering Hadji Osman, several times pilgrim to Mecca, whose ‘virtue was widely known...when he passed by, maladies disappeared, the growing crops took on a new vigour’. In gratitude, he wishes her Allah’s blessing and that she will be granted seven more children. She begs him to take the blessing back; he is bewildered.

Her face still buried in her hands, the woman shook her head from right to left, from left to right.

‘No! No! Enough! ...It is enough!’

All around, children metamorphosed into grasshoppers, bounded against her, encircled her, transformed her into a clod of earth, inert. Their hundreds of hands became claws, nettles twitching her clothes, tearing her flesh.

‘No. no!...I can’t endure any more!’

Hadji Osman refuses to take back the benediction, accusing her of blasphemy; she begs her husband to make the holy man understand. To her amazement, he backs her up; the neighbours come running and when the old man still refuses to take back his blessing, they beat him up and throw him out of the village.

The evidence gleaned from this limited selection of African novels concerning the pathways through which education may affect demographic variables reinforces the assumption that such pathways are complex. The school curricula, as described, seem unlikely in themselves to have had much direct influence in changing attitudes or behaviour, except possibly by inculcating the notion that cleanliness was next to godliness. Nevertheless, that one message alone might have had a role in the reduction of child mortality, especially when combined with the challenge which any schooling provided to the old belief systems of magic and ritual in which nature was always to be feared.

The immense prestige which education — even a small amount of schooling — is described as conferring made it possible for children to question the traditional beliefs and values of their parents or other elders and hence, perhaps, to introduce into the home what they had learned of nutrition and hygiene.

However, Christianity was so essentially entwined with education in Africa, as many writers pointed out, that the conflict was primarily between old beliefs and the new religion,

rather than between old and new ideas. Given that during the period described here the churches were largely hostile to contraception, their role in delaying its use may have been significant. In addition, birth control seems to have been associated with premarital or extramarital sex, perhaps undermining its acceptability in a 'respectable' relationship. Premarital sex is also seen partly as an outcome of education, which removes young people from their homes, or leads them to jobs away from those homes.

Marriage was as fundamental in Christian education as it had been in traditional life, but the process of acquiring an education and the ability to use that education to earn money may have delayed its timing, especially for girls. The books give an ambivalent view about the benefits of specifically female education: on the one hand, some parents fear that it will be wasted because the girl will become pregnant before marriage; on the other, an educated daughter might have better marriage prospects.

By contrast, there is virtual unanimity about the value of education, in terms of power, prestige and career path, for boys. Even those parents most troubled by the immediate opportunity cost of losing a worker on the farm are prepared to offer up at least one son on the altar of education. Such a hedging of bets, of course, implies the need for several children.

The unqualified optimism expressed here about the power of education to confer upward mobility and a secure future may also be significant in the comparatively slow African fertility transition; the possibility that the cost of children might retard or even overturn family progress is never expressed.

The use of literature to explore some of the factors which have a bearing on demographic mechanisms does, we believe, offer some insights into attitudes and behaviour, but it is of course partial and limited by the types of source material examined. We learnt surprisingly little about the links between parental education and health practices. In particular, there was no indication whether educated parents might recognize the importance of personal hygiene and precautions for the survival of their children; or whether better educated women might be more likely to detect illness earlier, initiate treatment and follow medical advice more readily. Neither did we learn whether educated couples had a view about ideal family size, let alone whether such a view was different from that of the less-educated. Chedid's North African villagers suggest that totally unregulated fertility may be unwelcome: further we cannot go.

However, this examination does reinforce the view that the pathways through which education affected fertility, in particular, are complex. While some of the outcomes of receiving an education in Africa which are depicted here could be expected to lead to fertility reductions, others had a tendency to reinforce traditional norms, at least in the short to medium terms. This similarly seems to have been the situation in nineteenth century Britain, but the factors which operated to accelerate or retard the transition did not necessarily work in the same direction in both societies. We suggest that further detailed studies of the effect of education in particular cultures are needed if the benefit of education — and especially the education of women — is to achieve its maximum potential.

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Transition from high to replacement-level fertility in a Kerala village *



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Abstract

This paper uses a micro-approach to examine the motivation and processes of rapid fertility decline in a Kerala village. Fertility declined in the village substantially during the 1970s and continued to decline to reach replacement level at the time of study. The proximate determinants are postponement of marriage and extensive use of contraceptives. However, the changes in these factors were the result of changing socio-economic conditions. At the time of study the singulate age at marriage was 29 years for males and 23 years for females, higher than elsewhere in India. Delayed age at marriage was a combined effect of favourable attitudes to education and economic changes. Smaller families became advantageous because of decreasing agricultural opportunities, expanded education and mortality decline. Contraceptives were available with the implementation of the family planning program. Higher use of contraceptives can be attributed to favourable conditions resulting from socio-economic changes.

As the demographic transition is under way in most of the states in India, the case of Kerala has been of interest to demographers as it is often considered an anomaly of the demographic transition theory, which holds that fertility and mortality declines occur only at higher levels of per capita income, industrialization and urbanization (Zachariah 1983). In demographic terms Kerala has achieved a later stage of transition, in which fertility has reached replacement level. Though there has been debate as to the exactness of the levels, trends and timing of the fall in fertility as evidence of demographic change, there is little doubt that fertility decline has taken place in Kerala and that the decline began earlier than was observed in the rest of India (Namboodiri 1968; Mari Bhat and Rajan 1990). However, the exactness of the levels and trends is not the focus of this paper. The focus is rather on explanations for the decline. In seeking such explanations authors have identified high female literacy; the custom of matrilineal inheritance; political leadership committed to social welfare; a settlement pattern that promotes individualism; communication; poverty; and greater use of social services (Nair 1974; Krishnan 1976; Ratcliffe 1978; Nag 1983; Nair 1986).

Explanations put forward so far are based on statistical associations of selected factors derived from macro-level surveys and secondary data, and do not explain how fertility decline has come about. There has not been adequate emphasis on why the communities started to have small families. It is important to ask why some societies have large families and others have small families. Is it because it is beneficial; if so, how? Answers to such

* This paper is based on data collected in research for a Ph.D degree in the Demography Program, Australian National University, Canberra.

questions would help us to understand the nature of demographic change, why it occurs and the conditions under which new demographic trends may emerge. I undertook a research project in a village in Kerala, using a micro approach with anthropological as well as the more common demographic investigative methods.

Micro-approaches are by nature participatory, and flexible, and can be improvised depending on need. They also help in acquiring specific and detailed information. Often such inquiries help people to realize the changes that have taken place during their lifetime. Respondents can often relate changes in their lives to overall change outside. They give information on what happened in the village and why, thus providing rich data on the processes of change and the context in which demographic decisions were made. Often respondents are the best judges of their own situations and can explain why certain decisions were made in a particular way.

The study village

The study village, with a population of 2378, is situated in Ernakulam district. Like many villages in Kerala, this village is connected with nearby towns by private buses, giving the villagers access to health services, employment opportunities and entertainment. The houses are scattered in continuous lines. The village has a primary school, which was a village school before it became a government - aided school. After completing primary education the students have to go to neighbouring larger villages for the next level of schooling, but the distance to post-primary schools did not cause students to drop out. In the study village, 95 per cent of both male and female children in the age group 5-14 are attending school; the dropout rate is negligible.

The village does not have any government health services; the nearest health clinic is seven kilometres away. However, there are three private clinics in the village; two doctors in these clinics practise Ayurvedic medicine and the other doctor is trained in the homoeopathic system. Discussion with villagers revealed that most of them go to nearby towns for health services, which are easily accessible because of the adequate transport system.

The economy in the village was changed by the Land Reform Act, which achieved its objective to a great extent in conferring ownership rights on the tenant cultivators and abolishing all the intermediaries; protecting agricultural labourers by conferring upon them permanent occupancy. Though this has not greatly improved the economic condition of the people, there has been a shift in the land ownership; castes and groups who were denied ownership of land were given opportunities or rights to own land. Minimum wage laws were also enacted protecting the agricultural labourers. These reforms helped in abolishing slavery, bonded labour and exploitation of labourers, and spread some egalitarian ideas in the population.

The effect of these laws is seen in the village, where tenancy has been completely abolished and castes which were not allowed to own land in the past can now own land. The agricultural labourers enjoy improved wages and have no economic bond to land owners. Agricultural labourers have organized powerful unions. Members of the upper castes who own land often remark that the agricultural labourers these days behave arrogantly and are not loyal to their masters. According to the labourers, the major change has been the options available to them to pursue non-farming jobs as well as education. Though most families have some land, a majority of them do not depend on agriculture only for income. Almost all families augment their family income through non-farming work, which varies from semi-skilled jobs to office work.

Of the total population in the village, Hindus form 46 per cent, Christians 42 per cent and Muslims 12 per cent. Christianity in general and the education policies of the State have improved literacy levels and health status in the village. The missionaries whose main interest

was the conversion of the natives to Christianity also established schools and hospitals (Nair 1981). Until 1930 the village had two primary schools, one Christian and the other Hindu, teaching mainly religious ideas. The two merged as one school when the government gave grants to promote vernacular schools. Christianity encouraged education irrespective of caste, which strengthened literacy levels in the village. Christianity also favoured female education leading to an improvement in the female literacy level in the state (Jeffrey 1987). At the time of this study, 86 per cent of the population were literate: 89 per cent of males and 83 per cent of females. Emphasis on female education combined with traditional high status of women among the matrilineal castes improved the status of women in the state.

The village has experienced significant changes in its social, economic and cultural structure, from a rigid caste structure to a more egalitarian society. In the past lower-caste people had to keep a distance from the upper castes to avoid polluting them; now such practices no longer exist as a result of social movements which tried to change the traditional caste system. This also gave the opportunity for the lower castes to pursue education which was denied earlier; this is reflected in the literacy levels in the village.

Fertility trends

The village registered a crude birth rate of 18.2 per thousand population and a crude death rate of 4.5 per thousand. Evidence shows that the low birth and death rates for the village are not an isolated phenomenon but a pattern found elsewhere in the state. The crude birth rate for the district where the village is located fell from 36.9 for 1965-70 to 26.2 for 1970-75 and to 21.8 for 1975-80 (Zachariah 1983:43). The birth rate for the whole state fell from 26.8 per thousand population in 1980 to 24.6 in 1983; the death rate for the same period fell from 7.0 to 6.7 per thousand population (India 1984). The crude birth rate for the state for the period 1992-93 was 19.6.

The total fertility rate at the time of the study was estimated to be 2.0. The age specific fertility rate was highest in the age groups 20-24(133) and 25-29(156), while it was lowest among the age group 30-34(69) and 35-39(51). The age-specific marital fertility indicates the effect of delayed age at marriage during the early ages and fertility control at the later period.

The low level of current fertility is indicative of declining fertility in the village, because the total marital fertility rate for the Ernakulam district (in which the study village is situated) during the period 1965-70 was 6.5 and declined to a level of 4.5 during the period 1975-80 (Zachariah 1981:148). The total fertility rate estimate based on the 1981 census for the state as a whole is 2.4 (2.5 for rural and 2.05 for urban areas) which indicates a low fertility (Census of India 1981).

A calculation of the average parity attained by exact age for age cohorts showed a declining trend in fertility level in the village (Table 1). The zero parity at exact age 15 and lower parity values at exact age 18 for older women show that childbearing did not start till late adolescence even in the past. Low parity values at exact age 20 for women in age groups 15-19, 20-24, 25-29 and 30-34 also suggest that childbearing started late among younger women. The small differences in parity values at exact age 25 for all cohorts suggest that though childbearing is delayed, there is no delay in having the first child. The large differences in parity values at later ages suggest that fertility is increasingly controlled among younger women in contrast to the older women once couples have the smaller desired number of children. Parity values for older women suggest that though childbearing was delayed they had high fertility levels. Table 1 clearly indicates that older women had higher fertility than the younger women, and fertility has been declining in the village to reach the current replacement level.

This low level of fertility in the village follows the pattern found in the district as well as the state as a whole. The total marital fertility rate for Ernakulam district during the period

1965-70 was 6.5 and declined to a level of 4.5 during the period 1975-80 (Zachariah 1981). For the rural areas of the state the marital fertility rate declined from 6.9 in 1972 to 4.8 in 1978 and in urban areas from 6.8 to 4.7 (India 1984). According to the 1981 census, the total fertility rate for the state was 2.07, the rural and urban rates being 2.12 and 1.84 respectively. A national survey carried out recently shows that fertility level in the state has reached near-replacement level. There is enough evidence that fertility in Kerala state, both in urban and rural areas, declined faster in the 1970s and 1980s than in the previous decade and reached replacement level in the 1990s.

Table 1
Average parity attained by exact ages for age cohorts, all women

	Exact age		Age at interview						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16		0.00	0.00	0.00	0.01	0.02	0.04	0.03	0.02
17		0.01	0.00	0.00	0.01	0.05	0.04	0.03	0.02
18		0.02	0.05	0.02	0.04	0.05	0.12	0.09	0.04
20		0.10	0.21	0.17	0.25	0.27	0.31	0.21	0.30
23			0.71	0.60	0.92	1.02	0.88	0.85	0.94
25			1.10	1.00	1.38	1.63	1.55	1.62	1.60
27				1.43	1.87	2.20	2.12	2.24	2.28
30				1.90	2.36	3.03	3.04	3.29	3.17
33					2.81	3.63	3.82	4.26	4.11
35					2.99	3.90	4.29	4.79	4.66
38						4.10	4.78	5.56	5.28
40						4.17	4.90	5.85	5.60
43							4.94	6.06	5.87
45							4.98	6.18	5.94
47								6.18	5.98

Source: Pregnancy Histories, 1984-85

Determinants of fertility

Fertility levels and trends indicate that two major factors of fertility decline are deferment of marriage and marital fertility control. During the early stages of fertility decline delayed marriage has contributed to fewer births, while marital fertility control through extensive use of family planning resulted in a steep fall in fertility rates. Delayed marriage age and a deliberate attempt by couples to limit fertility were a response to the overall societal changes.

Marriage changes

At the time of the study the mean age at marriage was 27.3 years for males and 20.2 years for females. The singulate mean age at marriage estimations provided an age at marriage of 29.2 years for males and 23 years for females. Thus the age at marriage in the village is consistent with the trend toward rising age at marriage for the state and the district (Zachariah 1984).

Table 2 shows that the mean age at marriage is rising in the study village. The age at marriage has risen by four years from 23.7 for the period 1917-39 to 27.6 years in 1980-84. The female age at marriage has also risen by four years from 17.6 during 1917-39 to 22.4 during 1980-84.

Table 2
Mean age at marriage for males and females by year of marriage

Year of marriage	Mean age at marriage					
	Males	s. d.	No.	Females	s. d.	No.
1917-39	23.7	3.5	11	17.6	3.1	36
1940-44	26.3	5.9	14	18.7	3.0	27
1945-49	27.2	5.7	20	19.2	3.1	33
1950-54	27.3	4.5	25	19.8	2.9	40
1955-59	26.3	4.2	35	20.3	3.4	41
1960-64	26.5	4.5	46	19.5	2.8	60
1965-69	27.7	5.8	52	20.5	3.6	56
1970-74	27.7	4.6	64	20.8	3.5	67
1975-79	27.6	5.2	91	21.6	3.6	93
1980-84	27.6	4.1	79	22.4	4.1	83

Table 3
Cumulative proportion of married women by exact ages, for age groups, all women

Exact age	Current age							
	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
N	128	102	86	77	59	49	34	47
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.01	0.00	0.03	0.02	0.02	0.09	0.04
20	0.16	0.32	0.19	0.44	0.47	0.43	0.50	0.47
25		0.74	0.64	0.78	0.81	0.88	0.91	0.83
30			0.81	0.86	0.92	0.96	0.97	0.94
35				0.90	0.93	0.96	0.97	0.94
40					0.97	0.90	1.00	0.94
45						0.90	1.00	0.94
50							1.00	0.94
55								0.94
Median age	--	22.4	22.8	20.7	20.3	20.7	19.1	20.2

The cumulative proportion of women marrying at exact ages from age groups 20-24 to 50-59 indicates that despite fluctuations due to small numbers, marriages have been delayed in the recent past. The median age at marriage calculated for each age cohort has risen, though it was stable around 20 years for some time.

It is very clear that the younger cohorts are marrying later than did the older cohorts. The small proportion of women married at exact age 15 for age groups 50-54 and 55-59 indicates that early marriages were not common even in the past. The large differences in proportion married at exact age 20 among age cohorts 35-39 and above and 30-34 and below show that the rise has been greater in the recent past. The most significant is among the age group 20-24 where only 16 per cent are married at exact age 20. It is clear that marriages before menarche were rare in the village. The median ages at marriage calculated for women in age cohorts show that half of the women in the age cohorts 30-34 and 25-29 were married at the age of 22, while half of the older women were married by the age of 20. These figures show a rising

trend in age at marriage among women. The rise in age at marriage has been observed among all the groups irrespective of socio-economic status. Thus, though marriage remains universal, the age at marriage is high.

A close examination of marriage histories shows that reasons for delay in marriage were not for restricting fertility but entirely socio-economic. Kerala has always had a relatively high age at marriage; it has been documented that in many matrilineal communities in Kerala, marriages of girls were not performed before puberty (Iyer 1912). One of the reasons for the absence of prepubertal marriages was that in many matrilineal castes women could have sexual relations with men from the same caste or a higher caste and children born to such women were considered legitimate. These practices in earlier days may have resulted in less concern about the modesty or purity of women, which seems to be one of the reasons for early age at marriage for women; elsewhere in India, often the rationale behind prepubertal marriage was to protect female modesty and purity (Caldwell, Reddy and Caldwell 1982; MacDorman 1987). The Nayar Regulation Act 1937-38 which abolished prepubertal marriage also prohibited the marriages of females under 16 and of males under 21 (*Gazetteer of India* 1965). These customs and Acts have kept the age at marriage higher among men and women. Furthermore, Christianity also favoured higher age at marriage as the Christian church believed in adhering to the law to a greater extent. According to the Indian Christian Marriage Act, 1872, the minimum age at marriage for males is 21 years and that of females is 18 years.

With increases in schooling, girls remain in school until late adolescence; rarely were girls withdrawn from school in order to get married. After completion of school the parents generally start arranging the marriages of their daughters. In general it takes two to three years to find a suitable match for the girls and perform the marriage. Because of the dissemination of information and improved education many parents feel that marriage at an early age is not good for women's health as early childbearing would be harmful. Thus education increased female age at marriage.

While socio-cultural values, improvement in female literacy and social reform movements contributed to the rise in female age at marriage, the main factors in the rise in male age at marriage in the recent past were economic. Many men decide to get married when they are in a position to establish an independent household. Older sons generally establish separate households after marriage and the youngest of all inherits the parental house; this phenomenon started when matrilineal joint families started breaking up into nuclear families. This also brought about a change in the residential patterns among the matrilineal castes. Among many matrilineal castes instead of the husband visiting his wife at her residence, they live under the same roof and in most cases the wife moved to her husband's residence as in many patrilocal societies. Marriages were arranged by parents and the principle of caste endogamy was followed. The dowry system which was previously prevalent only among the Brahmins and the Christians (Iyer 1912) was adopted by the other castes. It should however be noted that in the study village, dowry is taken to mean the daughter's claim to a share of her father's property. This claim has been strengthened by the fact that women in matrilineal families inherited property.

With the break-up of joint families fragmentation of land took place and land holdings became smaller. Agriculture was no longer viable and men were forced to seek non-farming jobs which forced them to learn new skills to engage in productive employment. Employment was a prerequisite for the marriage of men; this pushed back the marriage age of men.

Around the late 1960s and early 1970s, the reasons for a rise in the age at marriage were different. Marriage histories reveal that many marriages were delayed when the Land Reform Act was implemented. This Act abolished tenancy and allowed tenants the right to purchase the land. This delayed marriages as many bought land with the money which otherwise would have been used for marriage expenses. Since bonded labour and tenancy were abolished,

many tenants and labourers could not borrow money from their landlords as repaying the debt in the form of harvest and labour was not possible.

Marital fertility control

In the village, marital fertility has been controlled by the extensive use of family planning. Among the married couples with wives under 50 years of age, 69 per cent currently use family planning. The proportion who ever used any family planning method is 70 per cent. Most of them use family planning to limit family size; only 13 per cent use spacing to postpone pregnancies. Spacing methods were mostly traditional methods such as rhythm and withdrawal. The most commonly used method is female sterilization, the pattern found in the state as well as the country. Vasectomy users, though only 18 per cent, were the effect of 'mass vasectomy camps' conducted in Ernakulam.

About 40 per cent of the couples in the 20-24 age group, about 70 per cent of the couples aged 30-34 and 80 per cent aged 35-39 were using family planning. Most couples in the 35-39 age group were sterilized. One-fifth of the couples aged 20-24 and 25-29 were using traditional methods such as withdrawal and rhythm.

A high proportion of couples used sterilization after the third parity. Discussions with sterilized couples revealed that the older couples waited for three children and the younger couples waited for two children before using sterilization. This change is also partly because of the shift in the emphasis on the ideal number of children from three to two by the program planners. At the beginning of the family planning program the messages emphasized three children and later this changed to two children.

However, though child mortality levels were low in the village, couples took child mortality into account before using sterilization as it is an irreversible method. Hence, they decided to have one more child than they desired. It was found that users of any family planning method had a mean parity of 3.2 and non-users had a mean parity of 2.4. Moreover, though differences are small, sterilized couples experienced a lower child mortality than the users of temporary methods and also non-users of any method. The proportion of children surviving from sterilized couples was 0.925, while it was 0.892 for users of temporary methods and non-users of any methods. As the sterilized couples experienced lower child mortality than the users of other methods, they had less fear of child mortality; this made it easier for them to limit their family size. Use of contraception between marriage and first birth was almost negligible.

Around 60 per cent of both Hindus and Christians used family planning; no differences were found with educational levels or other socio-economic factors. Non-users of family planning were either younger with fewer children or older with high fertility. Half of the non-users had not completed their desired family size. Many of these younger couples were not satisfied with spacing methods and felt that as sterilization is the only method available, it was inevitable to complete the family size.

The village family planning program in many ways followed the national program. It can be traced as far back as the 1960s when the 'extension' approach replaced the 'clinical' approach. Moreover, the emphasis was on female sterilization. Discussions with couples revealed that local family planning workers made them understand that it is easier to get sterilized postpartum. The argument they used to convince women was that any additional period of rest is not necessary as it is customary in India to convalesce for three months after childbirth. Women who used the possible loss of wages as a reason against use of family planning could also be convinced about postpartum sterilization.

Increase in hospital deliveries also boosted female sterilizations. The proportion of ever-married women in the age group 15-59 who delivered their babies in the hospital rose from nine per cent in 1950-54 to 27 per cent in 1960-64, to 60 per cent in 1970-74 and to 90 per

cent in 1980-84. Correspondingly, the percentage of tubectomy users rose from ten in 1970-74 to 40 in 1975-79 and to 52 in 1980-84. Of all the sterilizations 80 per cent were done during the postpartum period suggesting that hospital deliveries helped in boosting female sterilizations. In two ways, hospital deliveries helped women. First, many women being literate could read messages on maternal and child health and family planning which exposed them to new ideas. Secondly, they could also ask the medical and paramedical staff in the hospital to explain immunization and family planning.

This high level of use of tubectomy in the village does not mean that people are totally satisfied with the method. There are couples who complained about after-effects of sterilization and maintained that it is the only method available to them. Many felt that spacing methods posed other problems. The official supply of oral pills and condoms was irregular and the brands marketed were expensive. Other problems mentioned in use of condoms were sexual dissatisfaction, insufficient privacy for their satisfactory use and difficulty in disposing of them after use. Intra-uterine devices were not liked as use of these caused health problems among women.

The decision makers

One factor which emerged during the discussions and in-depth interviews was the participation of women in fertility decision-making. Among the currently married couples in the age group 15-45, 35 per cent of fertility decisions were initiated by wives only, while 33 per cent of decisions were initiated jointly by husbands and wives. This behaviour differed with the age of the couples. Among the older couples with wives in the age group 40-59, 60 per cent of the fertility decisions were initiated by the women. This was mainly for two reasons: first, women were more easily motivated to have fewer children because of the inconveniences of childbirth. Secondly, women's decision-making power in the family increases with age and number of children (Hollerbach 1980; Epstein 1982). The timing of decisions among these couples was at a later stage of childbearing; most women were fairly old and were of high parity when they made these decisions.

Among younger couples, with wives below the age of 40, the fertility decisions were more often initiated jointly by the husband and the wife. There was increased communication between the younger couples. The spread of education and a weakening of traditional values regarding husband-wife relationships have led to a greater independence among couples. With the rise in the age at marriage and education, the wife is no longer a shy young bride in her teens, but older and mature enough to take decisions. Old couples often noted that their daughters and daughters-in-law were very free to talk to their husbands, while the older women claimed that they still did not talk freely with their husbands. This change, they believed was due to the movies and reading romantic novels. The strengthening of the husband-wife relationship is one of the factors in weakening extended family relationships (Poffenberger and Poffenberger 1975; Caldwell 1982), thus resulting in a shift in decision making from the head of the family to younger couples.

Initiating the use of the contraceptives also affected the method of use. Among couples in which the husbands were sterilized, 52 per cent of the husbands initiated the idea of using male sterilization, while 64 per cent of the wives initiated the idea of using female sterilization among those couples in which wives were sterilized.

I wanted three children and then decided to use tubectomy. I had previously used oral pills to postpone the pregnancy. No one disagreed (woman aged 27).

I wanted two children but my husband and my mother wanted me to have a female child as my two children happened to be males. The third child was also a male and they insisted

that I should have one more child but I decided that three children were the maximum I could have (woman aged 26).

I decided to have two children as I used to feel very sick during pregnancy. My family members did not agree but I insisted (woman aged 30).

Since sterilization required surgery, the spouses were hesitant to suggest such methods to each other.

We feared complications due to the operation but wanted to have only two children hence husband decided that we use condoms (woman aged 33).

I wanted two children but doctors refused to do tubectomy due to my ill-health. Then my husband decided that he would get vasectomized (woman aged 45).

However, there were instances of wives persuading husbands to undergo vasectomy.

I asked my husband to get sterilized when we had two children. Those days female sterilization was not widespread. So I was not sure of the safety of female sterilizations. Hence I insisted on male sterilization. My husband refused the idea on the grounds that he wanted a female child. I tried to persuade him once again when the fourth child happened to be female. This time he refused, arguing that sterilizations might lead to complications. He agreed only when I assured him that I would take up the family burden if he became an invalid (woman aged 40).

When I got my sixth child (only four survived), I felt that I should stop having children. My husband was a very irresponsible person. He used to spend his earnings on gambling. We lost a bit of land also. I had to work and feed the children. I could not manage childbirth and work. So I asked my husband to get vasectomized. He and my mother did not agree, fearing complications. I had another child. This time I had to promise him that I would take care of the children and him (woman aged 40).

Often in the case of male sterilizations the decisions were sudden because of peer pressure and the attraction of monetary incentives. Even in such cases women did not show any dissatisfaction as they were relieved of childbearing tasks.

The use of temporary birth control methods was jointly initiated by husband and wife; in most cases one made the suggestion and persuaded the other. It was often hard to identify which spouse initiated and who persuaded whom, because using temporary contraceptives, such as condoms, rhythm, withdrawal and abstinence, requires easy communication and understanding between husbands and wives.

When the couples decided to use female sterilization, all of them consulted their doctors, mothers and mothers-in-law as well as women who were already sterilized. The approval of mothers and mothers-in-law was considered important as their help during the postpartum period was always sought. The increase in hospital visits for maternal and child care has proved an opportunity for the women to talk to doctors, mainly about the safety of the methods. Moreover, most women, being literate, were able to read information and clarify their doubts.

In short, fertility decisions were ultimately made by the conjugal pair, though a number of factors influenced the decision. Women played a major role in deciding the family size and also the birth control methods to be used. This was mainly because women could communicate and also enforce their desires. With a tradition of better position of women and spread of literacy among women in Kerala, they had a say in matters of childbearing. According to Dyson and Moore (1983), one of the reasons for greater acceptance of family planning in the southern states of India is that women are less constrained by the influence of

other members of the family and that there is inter-spouse communication, which is clearly important in the adoption of fertility control.

Similarly Shorter (1973) noted that the combined effect of the female emancipation and birth control movements were important in the European fertility decline in the late nineteenth century. A study by Rainwater and Weinstein (1960) also showed that poor communication among conjugal couples and relatively deficient sexual relationships resulted in poor communication.

Desire for small families

The small family has become a norm in the village, and the main reason was the perceived economic cost of bearing and rearing children. There was a general feeling among the couples that children cost more now than in the past because living costs have increased and they have to spend so much on children's education and medical expenses. There were also other issues such as decreasing opportunities in agriculture and the inconveniences caused to women by childbirth. Discussions with old and young couples revealed one main aspect of social and economic change: the nature of child bearing and rearing has been transformed in the village, with a resultant rise in costs.

Perceived pressure on land

There is a strong feeling among the people that land holdings are becoming small and that the income from land is not sufficient to support the family. Villagers had a fair idea that population is growing and felt that land is becoming scarce.

When I came to this village after my marriage, this village was like a forest. There were few houses and few people. Now there are many houses and people (woman aged 64).

When I was a Panchayat Chairman 20 years ago, there were around 200 houses. Now houses have almost doubled (man aged 69 years).

Couples also felt that they did not have enough land to pass on to their children, so that the children could make their living.

I am a casual labourer. I have 5 cents of land. What do I give to my children? I can only give education to them. Two of my children are in primary school and I have already spent Rs.200 for their education (man aged 28).

We do not have any land to give my children. So we have to educate our children. Hence we have decided to have only two children (man aged 29, labourer).

We have only one acre of land and when we divide our land among our children each of them would get only a little which is not sufficient for them to live. We are educating them so that they can get jobs (man aged 49).

Many households in the village owned less than half an acre of cultivable land. The small holdings of wet land and the less labour-intensive dry land (where coconuts, cardamom, and cashews are grown) cannot absorb the large supply of labour, forcing the landless households and the families with small holdings of land to seek employment outside agriculture. Although there is no equal distribution of land, about 65 per cent of the hutment dwellers who traditionally were landless, owned less than half an acre suggesting a shift in the pattern of land holdings.

This was the result of a number of land laws enacted in the state from the nineteenth century onwards (Varghese 1970; CDS 1977); the comprehensive and radical land reform

legislation in the state was the Kerala Agrarian Relations Act proposed by the Communist government of the state in 1960. Although the Act was not implemented because of political opposition by land owners, a series of Acts and amendments were made to the original one and the latest act, the Kerala Land Reforms Act 1971, came into effect in 1970. The main objectives of the land reforms were: to confer ownership rights on the tenant cultivators and to abolish all intermediaries; to protect the rights of agricultural labourers by conferring upon them permanent occupancy and even ownership rights; and to attain more equal distribution of the land by putting a ceiling on holdings and distributing the surplus land to the landless. Oommen (1972) and Gopalakrishnan (1972) show that the first two objectives have been achieved in the state but not the last one.

As a result of these reforms, villagers felt that there has been a decline in work available in agriculture. Since the plots have become small agriculture is not viable and many are growing cash crops such as coconuts and cardamom; paddy is more labour-intensive. Many who worked as agricultural labourers traditionally are working mostly as semi-skilled workers. They work in granite quarries and road construction, and as loaders, a change in the occupational pattern in the village.

Perceived cost of living

The old and younger couples constantly said that living costs were higher now than in the past. This perceived rise in the cost of living is due partly to changing consumer aspirations and partly to the increased penetration of the cash economy. In the past, villagers consumed whatever they grew on the farm, and bought a few additional things such as salt, kerosene and matches. Moreover, the economic interdependence of castes made villages self-sufficient to a greater extent and many basic needs of the people were met at the village level.

In the past we ate whatever we grew. We used to get fish from the nearby river. Now we have to buy many things. It is not sufficient whatever I grow. I buy rice every year (man aged 60 years).

Now it has been difficult to live. We had a lot of land. I lost land at the time of the land reforms. I also sold two acres at the time of my daughter's marriage. My son has just started working. I spent on his education because he cannot live on land alone.

There have also been changes in food and clothing habits among the villagers. The concept of breakfast was alien to the villagers 25 years ago; they ate only two meals a day consisting mainly of rice and a curry for those who could afford it. Many labourers ate *kanji* (a semi-liquid dish consisting of a little rice and a large quantity of water) in the morning and dinner was generally rice. Drinking tea and coffee was unknown to many people. It is now a common sight in the morning that, while a group of men are having tea, one of them reads the newspaper aloud and others listen to him and discuss the news.

The pattern of clothing has also changed in the village. In the past, both men and women were semi-clothed, with only a piece of cloth around the waist. Menon (1979:111) observes that Nayar women and those belonging to the lower castes were prohibited from covering the upper part of the body. Though the position of Nayar women improved during the late nineteenth century, the prohibition continued for women from other low castes for a much longer time. With external influences the concept of proper clothing has continued to change, increasing the expenses in the family.

The lifestyle of the landless labourers has also changed over time. They could, in the past, acquire left-over food, old clothing, and a few things from the landowners for whom they worked. Ever since wages have been paid in cash the labourers have had to buy everything from the shop.

I worked as an agriculture labourer. The land we are living on belonged to the landlord. In the past we were paid in kind and we bought only salt and oil from the shop. Now we buy everything from the shop. Often the wages we get are not sufficient to buy things from the shop. These days one needs cash in hand to live (agricultural labourer, 79).

Now we buy everything from the shop. We always need cash to feed the children and educate them. In the past we got everything from the landowner's farm and cash was not important (agricultural labourer, 44).

Although the recollections of the agricultural labourers on the time when wages began to be paid in cash were not clear, it appeared that, in the study village, the payment of wages in cash (except for threshing) started during the late 1950s and early 1960s. It may have been related to the passing of the Minimum Wage Act in 1948 for different classes of employees of agricultural operations (*Gazetteer* 1965). Even then it may have taken a few years to make a complete change from wage payment in kind to cash.

With the growth of the trade union movement in the state the labourers feel that they are no longer slaves of the landlords; they are proud to buy their own food and clothes and happy to spend because it makes them independent. Agricultural labourers also spend on soaps and detergents to keep themselves and their clothes clean. It is now common to see labourers going to work in clean clothes and changing into work clothes (generally a cloth tied around the waist), and at the end of the day once again putting on clean clothes. Their needs have also changed in terms of proper clothing.

It is not only food and clothing habits which have changed, but also there are increasing aspirations to possess radios and watches and other material goods. Tharamangalam (1981:65) noted that the agricultural labourers in Kuttanad in Kerala had developed new aspirations: this had an effect on their consumer expenditure and made demands on the meagre incomes. Guruswamy (1986:117) also noted changes in consumer aspirations of villagers in Tamil Nadu.

Perceived cost of education

As mentioned earlier almost all the children of school age are in school. Educating children is considered a substantial cost by the parents. Though government-aided schools provide free education, parents argue that there are additional expenses other than the tuition fees. They argue that the school child requires better clothing and also more clothing than children needed when they did not go to school or when they went for a shorter time. There are additional expenses on books, notebooks, pens and pencils. Many activities in school also require extra money. Since transport has become available, many children insist on taking a bus to school. Often parents have to give in to the demands of their children such as for sweets and toys. Because of the small number of children it is likely that each child gets more attention from its parents and that the parents are more anxious to satisfy their children. In contrast, in a large family the children get less attention and often the older siblings take care of the younger ones.

The expenses of schooling varied for children at different socio-economic levels. Data on expenses on schooling are not reliable, partly because parents do not keep accounts of these expenses; however, some could give a rough estimate of the amount they spent. From the available data, the expenses on each child's education in a year varied from Rs.50 to Rs.500, depending on the economic status of the families. The rich always liked to send their children to nearby private schools, which are considered best and are expensive, and they also employ private tutors to improve the skills of the children.

I have eight children. I wanted to give them university education so that they have good jobs. I have only two-and-a-half acres of land which will be very little for each child when

divided. None of my children studied well. I spent Rs.500 for each child every year. I also employed a tutor to help them in their education (agriculturist, 50).

This year we spent Rs. 50 on each child's schooling. Education is the only thing I can give them. Otherwise they will be idle staying at home. They have nothing to do at home (agricultural labourer, 35).

The couples were asked the cost of educating a male and a female child; generally they felt the cost was the same. While a few parents said that they spent more on their sons because sons demand money to buy sweets and toys, others felt they spent more on daughters because of their clothing and other accessories such as face powder and bangles. However, education of daughters was considered equally important.

I have three acres of land and four children. If I do not educate them they cannot live on land alone. We spent more on our female children because of their dress and face powder, ribbons and so on (agriculturist, 51).

If our daughter is educated and has a job we hope that we need not pay dowry for her marriage. Education is the only thing we can give to our sons and daughters. The expense varies with the grade in which they are studying. Sons demand too much and they do not study properly but daughters are always kind and they listen to their parents (labourer, 40).

A number of factors contributed to the rise in educational levels in the village. The recent emphasis on education has arisen because of the determination to acquire non-farming jobs. Every couple of which the wives are in the age group 15-49 said that educating children is important to acquire a job. Though they are not certain about the university education of their children, they said that basic education is essential for any job they might wish to do in future. Non-farming jobs include white-collar jobs as well as carpentry, tailoring, driving or electrical wiring. Parents realize that white collar jobs are difficult to get unless a person has a higher level of education.

Now education is important because one cannot live only on land. I got an acre of land and if divided among the children they get very little. If daughters are educated they need not pay too much dowry on their marriage (agriculturist, 41).

My son is in fourth grade. We spend Rs.300 a year on his education. I want him to be a doctor or engineer. Then he would be respected by society. Perhaps he would take care of us (agricultural labourer, 38).

The increasing trend in non-farming jobs is because the land holdings are shrinking, through the laws of inheritance as well as because of land reform. The division of land began when the Cochin Nair Act of 1920 abolished the matrilineal system and allowed partition of property (*Gazetteer* 1965). Since the act was passed, the division of property has been taking place and the Census of 1951 observed that the highest number of partitions took place in 1939. It also observed that the growth in number of households increased without keeping pace with the population growth. This has resulted in small size of land holdings meaning that families cannot live only on agriculture but need non-farming jobs, which need skills attainable only through education. This increased the number of children who spent longer years in school. Thus the cost also increased.

Another government policy which reduced child labour is the higher wage rate paid to labourers. This has helped in two ways: first, labourers earn enough wages to buy food grains which are distributed through fair price shops in the village. It has been documented that the public distribution system of food grains has been very effective in the state. Secondly, the strong trade union movement in the state indirectly discourages child labour. The wage rates are generally influenced by labour unions which do not fix wages for children as this is

against the Child Labour Act. Also ideas about exploitation of labour are very common among the people and stop them from sending children to work. Thirdly, the cropping pattern in the village requires far less labour. Hence, adult labour is available, leaving children free from work; income from children is practically negligible. Though children help within the family they are not kept from school.

Perceived cost of medical treatment

Similar to the pattern found in the state, the village has also experienced a decline in mortality. Villagers also perceive that fewer children are dying at an early age. One of the reasons for declining mortality is promptness in seeking proper medical service which intervenes in time to stop a person from dying. In the past villagers generally used herbal medicines and also resorted to magico-religious treatment; now villagers generally use Western medicine to cure illnesses. However, other types of medication such as Ayurvedic and homoeopathic treatment were also extensively used by the villagers. Often children were given homoeopathic medicines on the grounds that it is easier to give children these, as the pills are sweeter and smaller, also cheaper. When these have no effect, Western medicine is used. Parents were very concerned about illnesses among children and paid for treatment. This concern is also growing very much with the extensive use of tubectomies which has caused fertility to decline.

People also used more than one treatment if a particular one was not yielding any results. This is partly because there is growing concern about health as well as because of people's beliefs about certain types of treatment. There is a strong belief that people have different bodily constitutions and, depending on their constitutions certain types of medicines are effective. Whenever they saw no improvement from a homoeopathic medicine, people believed that it did not suit the patient instead of questioning the effectiveness of the medicine. Failure was explained in terms of a person's constitution. There were also beliefs that homoeopathy cures simple illnesses and Western and Ayurvedic medicines cure serious ailments. Although Ayurvedic medicines are believed to cure chronic illnesses, people use this system less as it is considered more expensive, takes longer and requires rigorous diet restrictions. Often the belief about Western medicine is that it generates excess heat in the body and requires very nutritious food such as fruit and milk to cool the body.

There were no significant differences in the pattern of treating the sick according to socio-economic status. Most labourers went to government hospitals for treatment as they were cheaper than the private clinics. The plurality in seeking cures has been observed in other parts of India (Gould 1959; Minocha 1980; Caldwell et al. 1982), but this Kerala village differed because of the promptness in seeking treatment and also the narrowing gap in patterns of seeking treatment between different socio-economic levels.

People are increasingly realizing that the cost of medical treatment has risen largely because of these changes in the treatment of illness, particularly in the less fatalistic attitude to treatment. As a rule, government hospitals are free but, in practice, visits to them involve costs such as transport and the purchase of medicines. Whenever a child has to be taken to hospital in a nearby town, both husband and wife go together; this often means that the husband loses a day's wages. Government hospitals are crowded and one has to wait a long time for service, so people visit private clinics and hospitals which increases expenses. There is also a belief that the government health services are poor and one has to bribe the staff to get good service. This forces people to visit private clinics.

The rise in the number of hospital visits for antenatal checkups, deliveries and postnatal care has increased medical costs. Now, childbirth is considered more expensive than in the past when births were attended by traditional birth attendants at home.

Increased desire for small families by women

Though cost was an important issue in desiring a small family, women also desired small families to overcome such practical inconveniences as performing day-to-day chores during the antenatal and postnatal periods. The absence of anyone to care for the older children at the time of their mother's delivery and postnatal period has become a problem since nuclear families have become a common residential pattern. There are other costs. For the delivery of the first and to some extent the second child, women generally visit their mother's house; subsequent births take place at the husband's house. This means that the husband or a member of the husband's family has to help the women at the time of childbearing; if the husband helps on such occasions he must forgo his wages.

In the study village, 60 per cent of the women who stated they were currently housewives said that they discontinued working after marriage in order to take care of the children. Half of them expressed the view that they would resume working once the children were at school and 30 per cent were concerned that their going to work could disrupt the systematic care of their children or would affect the children's health.

The mothers in nuclear families are likely to spend more time in child care than those in joint families, where child rearing is shared by other family members, particularly grandparents whose time is least valued, so that the mothers can devote more time in an economically fruitful way, in activities such as food processing, farming and farm related work. Since nuclear families have become widespread in the village, the women are spending more time on child care and this may have helped in reducing child mortality in the village.

With changes in education in the village, the older children are still at school when their younger siblings require minding, and child care becomes a problem when the women have to attend work outside the house. With changes in family structure and in education, women are spending more time on each child's care, so they want small families.

Though the cost of bearing and rearing children was the reason for desiring fewer children, there were no couples who deliberately decided not to have children and everyone wanted children because of the pleasure of having children, the continuity of family lineage and the need for old-age security. Everyone believed that sons are needed to continue the family name and daughters are needed to nurse their parents in old age.

Though old-age security is one of the motives for couples desiring children, it does not influence the number of children they desire and was not the reason for having a large family. For many parents it was only a hope that children would take care of them. Moreover, the changing social and economic conditions leave the parents wondering about the future economic benefits from children. In some cases parents argue that, if they provide a better life for the children, which they can do more easily with fewer children, there is a greater chance that the children will take care of them.

Some cultural and social factors in the village gave some security to the old parents. There are strong cultural norms that old parents should be cared for and since there are no social taboos preventing parents from living with married daughters, both sons and daughters are equally valued. This situation is different from that in patrilineal societies found elsewhere in India, where strong social taboos prevent parents from living with their married daughters, and so they prefer more sons, which often results in large families (Karve 1953; Mamdani 1972).

The nature of the division of the property in the village also gives some security to parents in old age. The property is divided equally among all members of the family and the parental share of the property is inherited by the youngest son, since generally daughters live at their husbands' houses, thus parents live with their youngest son during old age.

Land reforms also allowed the landless labourers some security: the hutment dwellers could own the piece of land on which they had lived for a long time. Landless people can also

build a house on government land but have to vacate it if the government needs it, and compensation is paid at the time of vacation; this has given some security to the landless people who can build a hut on a small piece of land.

The agricultural labourer over 65 years of age now gets a pension of Rs.65 a month which gives him some support in old age. However, at the time of the study, the old parents in the village generally lived with one of their sons or daughters. Of the 450 households in the village, eight were single-member households. Of these three were priests, two in churches and one in a Pulaya temple, and they had never been married. Four separated childless women in their thirties, working as labourers, lived alone and a man aged 48 years who had never married lived alone. The four women, although separated from their husbands, lived very close to their brothers' families and they received support from their brothers whenever needed.

It was a norm in the village that the married daughters lived with their sick parents to nurse them. At present people still adhere to norms such as daughters nursing and sons providing for their old parents, but it is hard to predict the future because the couples who are getting some old-age security have fairly high fertility. The couples whose fertility is low are still young and still have children in school. Wanting old-age security did not affect the number of children the younger couples desired, because old-age security was a thing parents could hope for, whereas child-rearing costs were immediate.

Societal changes and preference for the small family

It is clear from the in-depth interviews that parents in the study village desire small families and this desire is because of the increasing cost of child bearing and rearing due to changing lifestyles in the village. The major changes in the village have been a reduction in the man-land ratio, the increased monetization of the economy, educational changes, mortality changes and introduction of family planning.

Because of population growth and inheritance, land holdings became small and in most cases were not viable for agriculture. Many peasants found agriculture not very productive because of the monetization of the economy. The peasants needed cash to carry out agricultural operations such as wage payments and buying better seeds and fertilizers, and often had to seek jobs outside agriculture partly to supplement the family income and partly to earn the cash needed for farming. The small size of holdings also caused a decline in demand for agricultural labourers. The Land Reform Act also brought changes in the agricultural sector. Although land reforms conferred tenancy rights upon the agricultural workers, those who did not have cash could not buy land; they suffered partly because the Kerala Land Reforms Act of 1963 also banned the creation of new tenancies (*Gazetteer* 1965) and because land owners were apprehensive about giving land for tenancy for fear of losing it.

This change forced many people to seek non-farming jobs. Education was the only means to acquire special skills needed for non-farming jobs, forcing parents to send their children to school, and educating children increased the cost of child rearing and decreased the work contribution of children to the family economy. Growing coconuts, pepper, cardamom and cashews in the village is far from labour-intensive and there is always a surplus of adult labour, so children seldom worked on the land and parents sent them to school.

The Minimum Wage Act also reduced the demand for child labour and created a situation where children could easily be sent to school. The wage rate of agricultural labourers has been high enough for them to buy food grains at fair price shops at subsidized rates. The involvement of government and trade unions in fixing wages prevented employment of children. The concept of exploitation is very powerful perhaps because of the active Communist movement in Kerala.

Apart from these changes in the village, the ability to read and write is greatly valued, particularly among the lower castes who were previously denied education. Literacy developed in Kerala State because of better rainfall and the growing of cash crops (Gough 1968), overseas trade, government policies, the commercialization of the economy (Nair 1983; Tharakan 1984), the position of women and government policies (Caldwell 1986; Jeffrey 1987).

The result of these changes was mass schooling. After a thorough examination of the relationship between fertility and education, Cochrane (1979) showed that the initial stage of mass schooling is associated with high fertility, but, as the process continues, mass schooling decreases fertility. Caldwell (1980) argued that with mass education the family economy changes and affects the direction of the wealth flow between generations and ultimately results in low fertility.

One direct influence of mass schooling on fertility is that the children cost more as parents spend more on schooling and because as the children spend long hours in school their contribution to the family income declines. The work contributions and cost of children and the net value of children as a component of fertility decisions have been well established (Hoffman and Hoffman 1973; Arnold et al. 1975; Bulatao 1975, 1979a,b, 1981; Hull 1975; Mueller 1976; Fawcett 1977; Nag 1978).

To some extent, mass schooling has produced an egalitarian society in the study village, where the lower castes have been able to improve their status through schooling and the jobs

associated with education. Thus, a person born in the Pulaya caste does not have to remain an agricultural labourer but can improve his status through education.

Schooling also helps the people to have access to more sources of information. Although knowledge of birth control and child health care is spread by door-to-door service, the ability to read the literature on family planning and health care provides more information than is given by the health staff during their house visits.

Changes in mortality

Mortality decline, particularly the decline in infant mortality in the village, has indirectly contributed to the fertility decline. The estimation of infant mortality from the retrospective birth histories in the village showed that infant mortality had declined from 102 per thousand live births for the period 1950-54 to 68 per thousand live births during 1970-74 and to 20 per thousand in 1980-84. The decline was sharp, particularly during the 1970s. This decline in infant mortality has assured many couples of the likely survival of their children, thus affecting their fertility decisions.

Infant mortality decline in the village is a combined effect of government policies and the community response to these policies. At the governmental level, health services are free; maternal and child health programs provide free antenatal and postnatal care, and immunization of children against diseases. At the time of the study, every child below the age of five was immunized against illnesses such as polio, tuberculosis, diphtheria, pertussis and tetanus. Mothers used their initiative to find out the place and time of the immunization program organized by the government health departments or by the missionary hospitals.

Apart from the government health services there are hospitals run by Christian missions which provide health services at a reasonable price; one of the missionary hospitals in Ernakulam gives free treatment to poor people.

The decline in infant mortality can also be attributed to the role women played in seeking health services. In the study village it was observed that when they were both present, husbands and wives made decisions jointly regarding where to go for treatment or what type of medicines to use; but a striking feature of decision making was that women were free to decide about treating the children in the absence of their husbands. The freedom for women to decide about children's health is a significant factor because mothers were usually the first to notice the sickness of the children and they took immediate action to treat the illness.

The women could make decisions because Kerala women enjoyed higher status than women elsewhere in India. Cultural factors contributed to the higher level of decision making power among women in the village. They were not restricted to the four walls of the house like women in other states in India, particularly North India. This kind of freedom was enjoyed by the women because of the tradition of matriliney and the spread of Christianity. Women were used to making decisions about their children when matriliney existed in the state. They made most decisions regarding the children, as the fathers had very little responsibility towards their children and they did not live under the same roof. Mateer observed of the women in Kerala:

Unlike their sisters in North India, the restraints imposed on them are few. They are not restricted to their own apartments, and the mother of each household occupies a dignified and honourable position. In the families of the Nayers she governs the whole house ...Her duties are not light, for, besides buying, storing up and giving out food for many mouths, she regulates the lives of the children, decides what schools they shall attend, how they shall dress, and what medicines they shall take when they are ill, their own mothers having no choice in anything that concerns them (Mateer 1883).

This illustrates the extent to which the women enjoyed freedom and status in Kerala over a hundred years ago. Women had great freedom of movement and decision-making power even in the past, with the exception of the women in the Nambuthiri caste. Many castes who followed the Nayars showed similar behaviour. Apart from matriliney, Christianity also contributed to improving the status of women.

The freedom of movement and the better status of women has contributed to higher literacy levels over the decades. It has been well established that the chances of child survival increase with higher level of female literacy (Caldwell and McDonald 1981). Literate women are more likely to know where the services are available and what type of medicines are effective, and are in a better position to convince their immediate family members. Since community-level female literacy is high, illiterate women are likely to observe literate women in the neighbourhood and to be influenced by them. Now, with education and employment, women's status has further improved. The freedom of movement has also allowed them to visit clinics without depending on male members of the family. When a child is sick the mother need not wait for her husband to return from work or ask the permission of in-laws to visit a doctor.

The major factors in declining mortality are health intervention programs, greater use of these services by all socio-economic groups and the organized transport system which helps in reaching these facilities. The in-depth interviews in the village showed that child survival played an important role in fertility decisions. However, it was also found that the couples with a few children provided enough health care to the children to stop them from dying. The greater chance of survival of the children motivated couples to limit the number of children, and the motivation to regulate fertility stopped children from dying by providing them with proper health care. Thus a two-way relationship was found between the fertility and infant mortality levels.

Family planning program

Largely because of socio-economic change the small family has become a norm in the village. The official family planning program has helped in regulating the number of children desired by the couples, but because a demand for a small family has emerged because societal changes, it is hard to separate the effect of family planning alone on fertility decline in the village. One argument put forward in explaining fertility decline in Kerala is a well organized family planning program (Kurup and Cecil 1976), but can the program succeed without a demand for small families? Pai Panandikar, Bishnoi and Sharma (1983) have shown that the success of the family planning program depends on community acceptance. However, the availability of family planning services cannot be ignored in explaining fertility decline. There is little doubt that the family planning program has succeeded in promoting knowledge and awareness; two other important components are the free availability of family planning methods and payment of incentive money to users which contributed to the acceptance of family planning. Given the socio-economic changes in the village, fertility would have declined, but with the existence of family planning program the rate of decline has been faster.

Conclusion

The transition from high to replacement-level fertility in the village is mainly because of postponement of marriage and extensive use of contraception, resulting from socio-economic changes in the village such as the monetization of agriculture and improved literacy levels. These factors seem to be common in Indian states such as Karnataka and Punjab, where fertility transition is taking place (Caldwell 1982; Nag and Kak 1984), but Kerala differed

from these states in its faster decline in fertility, since factors promoting lower fertility came into effect much earlier in Kerala.

The state has been experiencing changes from the beginning of this century. As a result of the changing political and economic situation during the second half of the nineteenth century and the first half of the twentieth century, agriculture became commercialized very early in Kerala. Literacy levels improved over the decades partly because of overseas trade and partly because the lower castes demanded the right to education. The combined effect of matrilineality and Christianity improved the status of women, which is reflected in improved female literacy levels and high female age at marriage. Mortality decline began early in Kerala owing to the health care programs introduced by the Travancore and Cochin governments (Panikar 1975). Thus, the state of Kerala underwent a number of socio-economic changes during the early part of the century. These changes created a need for smaller families and small families became advantageous.

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The first generation with mass schooling and the fertility transition: the case of Sri Lanka



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Abstract

This study attempts to explain the Sri Lankan fertility transition in terms of the pre-transition fertility regime and conditions leading to its destabilization. This study therefore deviates from previous studies of fertility in Sri Lanka which have largely focused upon the post-transitional fertility differentials. From the first formulation of demographic transition theory, education has been used as a significant factor relating to the fertility transition, but Caldwell's 'mass education-fertility transition' thesis can be regarded as the major attempt to explain the relationship between education and the onset of the fertility transition, with education a central explanatory factor in fertility transition theory. My analysis uses existing fertility theory to explain the education-fertility transition relationship, systematically tests that theory and suggests some modification to the theory on the basis of the Sri Lankan experience. The availability of relevant information in Sri Lanka has provided the opportunity to analyse the generations which contributed to the onset of the fertility transition and the continuance of that transition.

Caldwell's (1982) thesis of the relationship between the onset of mass education and the onset of the fertility transition certainly deserves respect for bringing education into the centre stage of the transition theory. Caldwell showed that there are mechanisms that can directly relate schooling to the onset of the fertility transition. He argued that these mechanisms were not identical in the contemporary developing world and in nineteenth-century European society. Although the evidence is scattered, he attempted to show that there was a substantial Westernizing influence in developing-world schooling and suggested that this was a potent force for change in the area of family relations. These arguments attracted my attention since Sri Lanka's educational system was heavily influenced by the British education system and the commencement of mass education occurred just 15 years before the onset of the fertility transition.

Although past studies of fertility in Sri Lanka considered education as one of the significant variables in explaining either fertility change or cross-sectional variations of fertility in the country, they failed to concentrate on the onset of the fertility transition but mainly centred on the examination of post-transitional fertility differentials. The analysis of post-transitional fertility differentials may be of significance for population forecasting or demonstrating the different economic demographic calculus used in the various social classes but such analyses contribute little to unravelling the nature of a change that has already affected all social classes. The present study concentrates on the onset of the fertility transition and attempts to explain this transition in terms of the pre-transition fertility regime and the conditions leading to the destabilization of this regime. Hence, this study carries out a historical rather than a cross-sectional analysis of fertility in order to understand the fertility

transition in its time dimension and in terms of the series of interacting changes occurring in society.

Importance of the first generation with mass schooling

Caldwell recognizes that it takes at least one generation to complete schooling after the onset of mass education, in order to witness the effect of mass education on the family relationships, and hence on the family economy and on the direction of the net wealth flow which will ultimately determine the timing of the onset of the fertility transition (Caldwell 1982:305). It has been established that the onset of mass education and of the fertility transition in Sri Lanka began in 1945 and 1960 respectively (Dissanayake 1995). This timing shows that the first generation with mass schooling started to complete schooling from 1960. Therefore, Caldwell's thesis seems to be relevant to the Sri Lankan situation when the timing of the onset of mass education and of the fertility transition are considered.

Caldwell's thesis assigns great importance to the first generation with mass schooling. It claims that the first generation with mass schooling act differently from their parents since their schools propagate Western middle-class values while traditional family morality is disdained or regarded as irrelevant to them. Schools direct them to capitalist production activities and move away from the family production and the family morality that sustained that production. Family production activity is controlled by family morality, which provides power to the senior male and which sharply differentiates production and consumption roles by age and sex. In the system of family production, high fertility is no disadvantage but low fertility can be destructive. This family morality cannot survive in the new familial culture which is related to capitalist production activities external to the family; and once the children are trained for non-familial capitalist production activities, they become future rather than present producers. Family relationships tend to adjust to this expectation and these changes make school-children less productive and more costly. The direction of the net wealth flows begins to change and in such a situation low fertility becomes advantageous (Caldwell 1982:304-305). Therefore, it appears that the first generation with schooling is the major force which destroys the traditional family morality and creates a new familial culture. Hence the present paper examines the fertility behaviour of the first generation with schooling comparing their behaviour with that of the last generation of parents without schooling. It is hypothesized that the fertility behaviour of the first generation with schooling differed from their parents' generation at least partly because of the increased formal schooling which destroyed the traditional family morality.

Sources of data

Demographic research traditionally has been more closely associated with quantitative analyses based on censuses, vital statistics and sample surveys. However, Caldwell and his associates (Caldwell, Reddy and Caldwell 1984a, 1984b; Caldwell 1985; Caldwell et al. 1987; Caldwell, Hill and Hull 1988; Caldwell et al. 1989a, 1989b) have attempted to widen the nature of demographic inquiry by adopting demographically informed qualitative research on population issues. This has been labelled the 'micro approach' to demographic investigation and is quasi-anthropological, combining ethnographic field research with surveys and censuses of small communities in order to arrive at a holistic understanding of demographic behaviour and change in a broad historical and sociological context (Caldwell 1985:51-57). My aim is to combine both the quantitative and qualitative approaches in order to provide a more comprehensive picture than could be obtained from relying upon either type of research alone. In this regard both national sample demographic surveys that provide quantitative

information and micro-level information gathered in small-area sample surveys are used. A list of these surveys with their related characteristics is presented in Table 1. In addition, other sources such as historical and contemporary literature and official statistics are introduced within the scope of the study.

The persons who were born during the period 1940-54 are defined as the first generation with mass schooling. A majority of persons in this generation were able to enter formal schooling with the onset of mass education, but before the onset of the fertility transition. When the growth in school enrolment rates from 1901 to 1960 is examined, the selection of this cohort as the first generation with mass schooling seems to be valid, because there was a 32.4 per cent increase, from 52.1 per cent in 1945 to 84.5 per cent in 1960, in the school enrolment rate during the 15-year period, compared to only a 27.9 per cent increase from 25.2 per cent to 52.1 per cent in the enrolment rate during the whole 44-year period from 1901 to 1945. The first generation with mass schooling was observed in the age groups 20-34, 30-44 and 32-46 by the SLFS of 1975, the SLDGP of 1985 and the SLDHS of 1987 respectively.

Why did the first generation with mass schooling act differently ?

Schooling hastened cultural change and created a new culture

Historical evidence suggests that Sinhalese society was proud of its own culture (Grossholtz 1984:98) and did not accept European culture at the beginning of European rule. It also seems that the Sinhalese were tolerant of other religions, but were happy with their own religion (Tennent 1850:281-282). However, the older traditional structures of Sinhalese society could not survive under the economic and political demands of colonial capitalism. Colonial rule transformed Sri Lanka from a feudal, monarchical, village-oriented subsistence economy to a capitalist, parliamentary, plantation-dominated export economy.

The educational system introduced by the British was one of the major supports of the capitalist economy:

The reform and reorganization of the government in 1833-34 signalled an important change in the orientation of the British. The government was being organized to fit the requirements of a British-run plantation economy. The role of the government in this new economy was to make British investment secure and profitable. Military power had secured control of the island and its population, but to continue to rule and to assure British investors of protection, the government needed some measure of support from the local population. To rule through political, as opposed to military, power meant to persuade some substantial portion of the population that the colonial government was legitimate or at least inevitable. The education system, by holding out rewards to those who would seek their fortune through learning the English language, customs and religion, was a means of spreading support for British ideology and economic policies (Grossholtz 1984:103).

Table 1
Surveys used in the study

Name	Year	Sample coverage	Sample size	Persons investigated	Methodology	Institutions involved
1. Sri Lanka Fertility Survey (SLFS)	1975	National	6812	Ever-married women	Survey	Department of Census and Statistics, Sri Lanka;

						Interantional Statistical Institute, the Netherlands
2. Sri Lanka Demographic and Health Survey (SLDHS)						
1987	National excluding Northern and Eastern Provinces	5865	Ever-married women	Survey		Department of Census and Statistics, Institute for Resource Development/ Westinghouse Maryland
3. Sri Lanka Demographic Change Project (SLDCP)						
1985	South- west low land areas	10964	All persons	Micro- Approach ^a and Survey		Department of Demography, Australian National Unviersity; Demographic Training and Research Unit University of Colombo
1987	Tea Estate in Sri Lankan Highlands	1290	All persons	as above		as above

^a Micro-approach refers to an anthropological approach including participant observation

The most significant social consequence of the educational system was the emergence of a new class:

Almost all of them had enjoyed an English education, though at different levels. They were proficient in the use of English language, which had opened to them the new world of Western learning and ideas. Both consciously and unconsciously, they had adopted the scientific, rational outlook on life which now influenced their attitude to the society in which they moved. More concretely, they had adopted European dress and modes of living. This progressive and forward-looking class became the focus of developments in twentieth century Ceylon (Arasaratnam 1964:164-165).

Pre-colonial traditional education was pyramidal in structure. At the top of the pyramid, there were only a few people, mostly monks and noblemen, who had an advanced level of education. Therefore, traditional education was more religious in content than formal Western education. At the base of the pyramid there were the masses who obtained little more than the rudiments of reading and writing and training in crafts and trades (Rahula 1956:301-302; Ruberu 1962:9-13). It is discernible that pre-colonial schools were not representative of the entire society; rather they were designed to serve the needs of a class within that society.

Schools that emerged in Ceylon during the British rule reflected the power and the educational needs of the British. Both the missionaries and the colonizers saw education as a means for accomplishing their own ends. They aimed at

promulgating Western culture, the Christian religion and a more formal, impersonal type of education. Indigenous practices and traditional Buddhist culture were shunted aside and downgraded in prestige and privilege. Village and temple 'schools' persisted but fared poorly in competition until they wasted away or adopted Western, government approved educational procedures (Ames 1967:25-26).

Missionaries and colonial administrators did not consult the local population in determining the scope and content of schooling. Schools never held out the prospect of integration into the indigenous culture of those who attended them even until the late 1960s (Ames 1967:33). The British established schools to fit the Sri Lankan people into a world different from the one in which they were born and in which their parents lived and worked. 'English schools were started in Ceylon to provide recruits for government service' (Mendis 1944:37). 'Yet, to return to his village without white collar employment would be unthinkable to a student; better to have no secondary education than to be an educated peasant' (Ryan 1961:473). The educationist Jayasuriya mentioned that the school system and its curriculum during the late 1950s were not aimed at fitting children for life in the community (Jayasuriya 1960:24). It appears that the school system exposed to the first generation with mass schooling had little to do with the society and indigenous culture and served as a mechanism whereby the schooled would gain a new social place and a new culture rather than be prepared to work within the context of indigenous culture.

Schools a major instrument for propagating Western middle-class values

The intention of the British colonial rulers was to create a new class committed to the culture and ideology of the British through English education. Fredrick North, the first governor, recognized the importance of creating a new class of native elite which could assist in disseminating British values (Jayaweera 1979:153). In this regard, the Colebrook-Cameron report has this interesting passage:

The peculiar circumstances of Ceylon, both physical and moral, seem to point it out to the British Government as the fittest spot in our Eastern dominions in which to plant the germ of European civilization, whence we may not unreasonably hope that it will hereafter spread over the whole of these vast territories (cited in Mendis 1956, vol. 1:182).

Therefore the school system was directed towards promoting new moralities. It has been observed that

no attempt was made to incorporate traditional elements of local education in school teaching. Little account was taken of sociological factors and environmental conditions. Children learnt out of books which were prepared for children elsewhere. English heroes and English history and English outlook were substituted. It was thought moral education could best be given through English classics and through the Christian scriptures... (Corea 1969:158).

It is evident that an alien culture was imported into Sri Lankan society through the education system.

In addition, even in the 1940s, it was observed that 'all children irrespective of religious conscience attended any school but the Buddhist and Hindu religionists outnumbered the others even in Christian schools. The results were denationalization, conversion and

acculturation with loss to national culture' (Wijesekera 1949:110). Buddhist and Hindu children brought this new value system back home to their families.

It is important to note that although the 'free education policy' was established in 1945, Western education played the major role until the late 1960s. 'The preponderance of Western curriculum over Buddhist schools and traditional Buddhist curriculum has continued down to the present [1967]' (Ames 1967:33). Christian-managed schools received twice the amount of Government grants given to Buddhist-managed schools during the 1958-59 period (Kearney 1964:130). English still continues as a compulsory second language. All government activities were carried out in the English language until 1956 and it was a mandatory prerequisite to enter the political elite (Singer 1964:71-73). 'Practically all schools today [1967], including most Buddhist temple schools, are at least ideally committed to a modern, Westernized curriculum' (Ames 1967:33). Therefore, it appears that the majority of children began to be exposed to Western middle-class values after the onset of mass schooling in 1945.

In sum, the school system trained children for capitalist production activities rather than family production activities. The traditional family morality that sustained family production was moving away from families as school-age children were being trained for a new social place in a new culture. The first generation of children with mass schooling were learning mostly British middle-class values since the schools adopted a British curriculum until the late 1960s.

Improvement in female education

The onset of mass schooling in 1945 was not a sudden phenomenon but the end result of a series of significant events (Dissanayake 1995). Colonial governments took various steps to improve the education system before 1945 and parents were also motivated to send more of their children to school from 1945. Expansion of the school system has long been one of the popular political priorities and once governments were elected based on popular votes after 1948, with the introduction of political parties, each government had to provide educational facilities for the masses in order to secure its political power (De Silva and De Silva 1990:13-21). Therefore, Government education policy became a major focus of debate not only in Parliament but also during elections. In addition, a dramatic increase of the population after 1946 forced governments to build more schools, to recruit more teachers and to purchase more equipment in order to maintain the existing education system (Wijemanne 1976:212). As a result, expenditure on education rose from 85 million rupees in 1950 to 270.4 million in 1960 and 1388.2 million in 1980 (United Nations 1986:103).

The literacy level of the population also increased dramatically after 1946. The most noticeable characteristic during this time was an increase in the female literacy level. In 1946, the female literacy level was 43.8 per cent compared to 70.1 per cent for males. By 1981, the female literacy rate had doubled to 82.4 per cent to approach the male rate which had increased to 90.5 per cent. School enrolment data indicate that boys and girls participated equally in the educational process (Jayaweera 1979:168). In 1970, 72.7 per cent of children aged 5-14 years received primary and secondary education. School enrolment for boys was 74.6 and for girls 70.8 per cent.

The change in women's attitudes and behaviour from a traditional to a modern state is generally considered the basis of their status enhancement and an essential prerequisite to the reduction of fertility (Stycos 1979; Nag 1983; Kasarda, Billy and West 1986; Indiradevi 1987). It is believed that women's education is a crucial factor in this transition which requires a shedding of older values and beliefs; increased involvement of women in institutions of the larger society; improvement in the position of women within the household

and the community; and greater autonomy of women to shape their biological and social destinies (Freedman 1963; Inkeles 1974; Dixon 1975; Caldwell 1978, 1980; Cochrane 1979, 1983; Graff 1979; Wolfe 1980; Chaudhury 1982; Curtin 1982; Kasarda et al. 1986).

Before the onset of mass education, most of the children either helped in domestic work or engaged in familial production activities. This phenomenon is confirmed by women of age 55 years and over who were interviewed in the Sri Lanka Demographic Change Project in Welisara and Loluwigoda localities. About 88 per cent of these women said that boys used to be engaged in domestic work or family production activities while 99 per cent of them indicated that girls used to be engaged in familial work. When these women were asked what had changed in Sri Lanka since they were young, the major three answers were: girls have education (37.8 %); girls have jobs (18.5%); and an increase in economic problems (14.8%). This indicates that the major change that was noticed compared with the past, especially by the women who were born before the onset of mass education, was the increase in female education.

Employment expectation and increased unemployment

A majority of the last generation of parents without mass schooling valued their children's schooling, as they expected that their children could get better employment outside of the home than had been available to them. This is evident from the SLDCP data, which show that 60 per cent of the last generation of parents without mass schooling wanted their children to be educated in order to get employment outside the home. However the children who found employment for the first time had to wait an average of 3.8 years after completing their schooling before obtaining their first job.

The censuses of 1963 and 1971 indicate that employment opportunities available for the first generation with mass schooling were not satisfactory. In 1963, 30.5 per cent and in 1971, 36.3 per cent of persons aged 15-24 were unemployed (Wilson 1975:134; Department of Census and Statistics 1986:178). In 1969, the group who had passed the General Certificate Examination (Ordinary Level) formed 36.4 per cent of those members of the work force who were unemployed. In addition, there were 10,000 university graduates among the unemployed (Politicus 1972:261). This indicates that unemployment was high among the educated. It has been pointed out that educated unemployment was a result of the education system which mainly trained persons for white-collar jobs and the inability of the economy to absorb workers trained only for white-collar employment (Jayaweera 1979:142; United Nations 1986:61).

Delayed marriage

It is evident that the better-educated women of the first generation with mass schooling have postponed their marriage by 1.3 years compared to the last generation of parents without mass schooling. They postponed their marriage mainly because of economic reasons: unemployment or under-employment. The women of the previous generation married at an earlier age because most of them did not have any formal schooling. In addition, parents wished to be free of the responsibility of keeping their daughters at home. About 62 per cent of the women aged 55 years and over interviewed in Welisara and Loluwigoda mentioned the above factors as the major causes of the earlier age at marriage in their generation. Therefore, it is evident that the increased educational level and the overall increase in both male and

female unemployment¹ caused marriage delay among the first generation with mass schooling. In addition, their education gave them greater independence to select their own partners in marriage, which possibly contributed further to the delay.

Early first birth

The present analysis finds that 11.3 per cent of the first generation with mass schooling have had premarital conceptions compared to 8 per cent in the previous generation. The higher incidence of premarital conceptions among the better-educated women in the first generation with mass schooling is another indication of their increased independence. Since there was a higher incidence of premarital conceptions, we can expect a shorter interval between marriage and the first birth among the better-educated women compared to their mothers. The evidence shows that they did indeed have their first births relatively early, but the relatively small incidence of premarital conceptions suggests there should be other reasons for the shorter interval between marriage and the first birth in this generation. There is a claim that the increase in formal education at the initial stages may first serve to raise fertility by improving health conditions with the diffusion of improved knowledge with regard to personal hygiene, food care, environmental dangers and so on (Bjork 1971; Easterlin and Crimmins 1985). Some of the relatively early start to childbearing by the first generation with mass schooling may be attributed to these changes.

It also seems that women of the first generation with mass schooling who delayed marriage wanted to have their first birth relatively early, as this could be regarded as a kind of compensation for the marriage delay caused by the need for increased educational attainment and a longer waiting time to obtain employment. Also an early first birth may result in an early breaking away from one's parents. Although evidence suggests that the parents of the first generation with mass schooling placed more emphasis on their children's academic success than on their help in their old age (Straus 1955:155), the family tradition which has dominated Sri Lankan society has been that of taking care of parents in their old age (Leach 1961:104-116; Yalman 1967:101-107). According to the Welisara and Loluwagoda surveys, about 44 per cent of women aged 55 years and over mentioned that young people did not help aged parents as much as formerly, while 28 per cent said that some children did help their parents in their old age. They also said that the economic problems of the children prevented them from helping their parents. Once a couple who have more independence become a family at a relatively early stage with their first child, the chances of them helping their parents, especially economically, may decrease with their own increased economic problems as evident in Welisara and Loluwagoda. Under such circumstances, the wealth that has been already flowing away from the parents to children with their schooling will continue to flow further in the same direction when children begin separate families.

Fertility decision making

It was concluded earlier in this paper that the family size changes in Sri Lanka involved strategies related to decision making throughout the reproductive time span. Fertility decision making has been discussed in many theories of fertility (Becker 1960; Fishbein 1972; Hoffman and Hoffman 1973; Hass 1974; Willis 1974; Easterlin 1978). The investigations have been usually made about the nature of the family as an entity, the types of relationships among its members and the associations between the family and society. Decision making

¹ Age at marriage of the women is dependent on the employment opportunities of males as well.

with regard to familial activities can be regarded as the central activity of every family throughout its life cycle. The locus of the power in a family is directly related to the persons who make such decisions (i.e. the marital authority pattern) (Hill 1965:127). Therefore, the family transition depends at least partly on the person who decides the familial activities. The increased autonomy among women is considered one of the important elements in most family transitions (Goode 1982:183-186). Education of the wife is frequently mentioned as one of the variables which influences the marital power structure in the family as it ensures a greater participation in family decision making by the wife (Goode 1982:84; Sud 1991:43). It has also been claimed that modern education with its accompanying 'Western middle class values' can destroy the traditional family morality by weakening the authority of the husband over the wife (Caldwell 1982:322-323).

When the power of the traditional extended family system decreases with economic development and social modernization, the authority exercised by others over the roles and status of women and over their decisions will also decline. According to the SLDCP, only 41 per cent of the first generation with mass schooling lived in extended families, compared with 53 per cent in the last generation of parents without mass schooling. Although uneducated or less-educated people in the previous generation were more likely to live in extended families, people in the first generation with mass schooling had more nuclear family structures irrespective of their educational status.

In addition, most of the people in the last generation of parents without mass schooling were engaged in familial activities, in contrast to the first generation with mass schooling which consisted of more non-familial wage earners. According to detailed occupational structures gathered in seven localities in the SLDCP, 54 per cent of the previous generation engaged in familial work compared with just 35 per cent of the next generation. The better-educated people in both generations have always been more likely to live in nuclear family structures. The proportion of nuclear families among the better-educated people in the previous generation was 53 per cent; in the next generation it was 62 per cent. Among them, 52 per cent in the previous generation and 59 per cent in the next generation were engaged in non-familial wage employment. Uneducated or less-educated people in the last generation were more likely to live in extended families (70%) but were more likely to live in nuclear families (61%) in the first generation with mass schooling. When uneducated or less-educated persons are classified into two categories: wage employment and non-wage employment, the proportion of nuclear families among the wage-earners and non-wage earners rose from 37.9 and 27.2 per cent respectively in the last generation of parents without mass schooling to 62.1 and 58.1 per cent respectively in the first generation with mass schooling. This higher incidence of nuclear families irrespective of education and occupation is perhaps an indication of the effect of mass schooling on the whole society.

Since the educated group forms the majority of the first generation with mass schooling, we can expect that the uneducated or less-educated minority group imitated the majority group's behaviour and started to move away from the traditional extended family structure. It is therefore, reasonable to accept that pressure from the kin group on family decisions in the first generation with mass schooling was relatively low and this perhaps strengthened the bonds in the husband-wife relationship. Once kin group influence is weakened, the relative influence of the husband and wife becomes important in family decision making. Although the husband usually derives a measure of assertiveness from the social norms which exist in a patriarchal system like Sri Lankan society, variations can still be observed among individual couples with respect to the power each spouse has in decision making. This is due to some comparative resources that the husband and wife each bring into the marriage in the form of higher education, a well placed family background, financial resources, a job at the time of marriage (Blood and Woolfe 1960; Safilios-Rothschild 1982). In the case of the first

generation with mass schooling, the resources that they commonly brought which the previous generations did not possess, were higher educational qualifications and associated wage-occupations.

As family planning decisions are taken throughout the wife's reproductive time span, they can be regarded as providing some of the best insights into indicators of the family decision making process. Family planning decisions are among the most rational and conscious decisions (Coale 1973; Caldwell 1982; Coale and Treadway 1986) that a family makes as they involve awareness of the possibility of planning and the selection of the most suitable means to achieve that rationally-perceived goal.

The investigation made in Welisara in the SLDCP provides a unique opportunity to examine the family planning decision-making process in the first generation with mass schooling in comparison with the previous generation. The evidence available from the Welisara survey shows that a higher proportion of family planning decisions were made by wives alone² compared with husbands' decisions in both generations. The corresponding proportions were 62 per cent for the previous generation and 50 per cent for the next generation. This indicates that the wives have taken the major responsibility in making family planning decisions. Among these women in the first generation with mass schooling, 86.9 per cent were uneducated or less-educated compared with 50 per cent in the last generation of parents without mass schooling. The relatively low proportion of decisions made by the wives of the first generation with mass schooling was due to a corresponding increase in the husband's decision making alone and a rise in the proportion of joint decisions by both husband and wife. About 11 per cent of the husbands alone and 15 per cent of both husband and wife jointly made family planning decisions in the last generation of parents without mass schooling in contrast to 19 per cent and 23 per cent in the first generation with mass schooling.

The increased participation of husbands and a rise in the joint contribution by both husband and wife in making family planning decisions is probably a reflection of the increased educational level of both spouses in the first generation with mass schooling. Therefore, we find that about 57 per cent of the family planning decisions have been made either jointly or by the husband alone in such couples, compared with just 25 per cent of the decisions made by the couples or the husbands alone in the last generation of parents without mass schooling. This suggests that a higher proportion of better-educated husbands were also taking responsibility for making family planning decisions because of the increasing pressure from their educated wives. This can be a reflection of a more egalitarian marital power structure in the families of the first generation with mass schooling. A study on a small town in India has shown that there is a close relationship between the increase in educational levels of both husband and wife and equality in the marital power structure in the family (Sud 1991:43).

It has been shown that the most common method of fertility regulation practised before the 1960s in Sri Lanka was rhythm (Caldwell et al. 1987:13). It seems that the relatively high incidence of wives' decision making in family planning observed in the last generation of parents without mass schooling was a result of the use of the rhythm method which is a traditional female method, by a relatively large proportion of women in that generation. In Welisara, about 45 per cent of the women have used the rhythm method alone to plan their fertility. They preferred rhythm to the other methods as they considered it a natural and

² The question, 'Who makes family decisions?', had seven possible answers: 1. wife alone, 2. husband alone, 3. both husband and wife, 4. both husband and wife with other family members, 5. (wife or husband absent/dead) other family members, 6. (living with in-laws) other family members, 7. no response.

convenient method which does not have any harmful effects on health. The proportion of women to have ever used the rhythm method in Welisara dropped to 34 per cent among the first generation with mass schooling as a result of an increase in the use of sterilization to stop childbearing.

Although modern methods of contraception were available from the mid-1960s, the Government family planning program emphasis was mainly on sterilization with the introduction of a cash incentive payment to its acceptors in 1980 (De Silva 1992:42). The first generation with mass schooling was the first group exposed to these services as they were aged 25-39 in 1980. Among the women in that cohort who used female sterilization in Welisara, about 79 per cent were better-educated women. They considered sterilization the most effective way of controlling childbearing. It is evident that most of the first generation with mass schooling used traditional methods to space children and then switched to sterilization to stop childbearing after having achieved their desired number of children. The SLDHS data show that 87 per cent of the uneducated or less educated and 90 per cent of the better-educated women, in the first generation with mass schooling, used sterilization to control fertility after having achieved their desired family size.

According to the SLDHS, 12 per cent of the couples in the first generation with mass schooling used sterilization without having achieved their desired family size. It appears that a substantial minority of the total population controlled their fertility without having realized that their reduced fertility is advantageous. It has been argued that government can make 'fertility limitation seem — or indeed truly — advantageous to individuals and families according to the system of rewards and punishments it establishes' (Caldwell 1993:311).

Influence of the government

Population planning has been included in all development planning in Sri Lanka from 1959 in order to aid economic development (Government of Ceylon 1959:16; Ceylon 1971:21; Dangalle 1989:313). The government elected in 1977 declared its population policy thus:

- (a) The government is concerned with the rate of population growth and its policy is to take all meaningful steps to curb unplanned growth of population;
- (b) Enhanced family planning services will be provided by the State and financial incentives with a view to controlling the population explosion will be given to individuals who practise family planning;
- (c) In the field of family planning emphasis of the government will be in the field of service-oriented programmes to enable motivated couples and individuals to receive family planning services and to undergo sterilization voluntarily (Dangalle 1989:308).

In 1977, the national population and family planning program was decentralized by establishing the District Population Committees. In 1979, the Population Division was established within the Ministry of Plan Implementation in order to co-ordinate the entire population program and its family planning service activities. In the preliminary stage, the program attempted to educate people by organizing village-level seminars. The messages conveyed were that high fertility would be disadvantageous to individuals, to families and to the whole country; and also that high fertility could be controlled by using modern contraception, especially surgical contraception.

In 1980, the government introduced a payment scheme to the service providers and acceptors of surgical contraception. According to this scheme, a medical team was paid Rs.65 for a tubectomy and Rs.35 for a vasectomy. At the introduction of this scheme, an acceptor was paid Rs.100 but later this was increased to Rs.500. The payment for acceptors was

regarded as reimbursement for expenses borne by the person undergoing surgical contraception (Dangalle 1989:310).

Some writers stated that the rapid increase in sterilization was mainly due to the introduction and the subsequent increase in the payment to acceptors (Williams 1982; Thapa, Abeywickrema and Wilkens 1987; Basnayake 1988). On the other hand, some claimed that the increase in sterilization was due to the readily available services through the government and also non-governmental programs (Dias and Dias 1988; Hapugalle et al. 1989).

Although there are several views about the acceptor payments, it seems that the payment to medical teams (doctor, nurse, midwife, health worker) had some significant effect on the increase in sterilization, as health teams were more ready to motivate their patients in favour of surgical contraception. According to Welisara survey data, 58 per cent of the women who used surgical contraception were encouraged to do so by health teams. It is also evident that the health team pressure had more effect on the uneducated or less educated women of the first generation with mass schooling. In Welisara, 73 per cent of the uneducated or less-educated women and 50 per cent of the better-educated women were encouraged to use surgical contraception by health teams. This suggests that a relatively high proportion of better-educated people voluntarily decided to adopt surgical contraception compared with the uneducated or less-educated women.

The available evidence therefore, proposes that the strong national family planning program launched by the government after 1979 was also influential in determining fertility, especially the stopping behaviour of the first generation with mass schooling. The government made low fertility seem advantageous to individuals and to the family by providing rewards not only to the acceptors but also to the service providers. The government also created an appropriate infrastructure in order to provide effective techniques for fertility reduction. Although the government emphasized that fertility control should be left to individual choice, a substantial minority controlled their fertility without conscious choice because of elements like the cash payment to the service providers. However, it was also observed that the government's focus was less on the better-educated than the uneducated or less-educated people.

Summary

It was found that education was one of the major factors that contributed to the reduction in fertility of the first generation with mass schooling. The first generation with mass schooling differed from the last generation without mass schooling according to exposure to English middle-class culture, education of females, employment, children's educational levels and family structure. Accordingly, the present study found that education was the major factor responsible for such differences observed between these two generations.

The improved educational attainment of the first generation with mass schooling pulled them away from traditional family-based work and directed them toward public sector non-manual employment. However, the economy during the 1960-69 period was not capable of absorbing all of these better-educated young people and the result was a relatively high unemployment rate both among males and females. These young people had to wait a considerable time to obtain what they considered to be suitable employment. As a result, they postponed their marriage longer than did their parents; this reduced the potential reproductive time available to them. The postponement of marriage was possible because of the reduced parental pressure on this generation. In addition, the greater independence that they obtained through Western-type education encouraged them to select their own marriage partners unlike their parents' generation. Once they were married, they moved away from the traditional

family home and started a separate nuclear family unit. This behaviour was part of the middle-class culture they had acquired in their schooling and upbringing.

Although their marriage was delayed, the first generation with mass schooling had their first birth early in order to compensate for the marriage delay necessitated by the need for increased educational attainment and the longer waiting time required to find suitable employment and also to assign a separate identity to their newly formed family. The first generation with mass schooling sent more of their children to school because they highly valued children's education and recognized it as a part of their culture. Therefore, the net wealth flow from parents to children which began with the onset of mass schooling (Dissanayake 1995) continued and indeed the balance shifted more in favour of children. Hence, the first generation with mass schooling realized that low fertility was advantageous to them. The strong national family planning program launched by the government after 1977 created an appropriate infrastructure in order to provide effective techniques for fertility reduction. In addition, the first generation with mass schooling could make decisions to reduce family size with less interference from kin groups since they were living as nuclear families. This strengthened the bonds in the husband-wife relationship. The increased educational levels of husbands and the greater power acquired by wives within the family with their higher educational qualifications and associated wage occupations, encouraged them to make joint decisions regarding family planning.

A synthesis

The present study is completely in agreement with the Caldwell thesis which recognizes that the first generation with mass schooling is the major force which destroys the traditional family morality and thus the basic morality of the society and creates a new familial culture. Education of the first generation with mass schooling induces changes in the familial relationship for the following reasons: (a) schooling speeds up cultural change and creates a new culture; (b) schools serve as a major instrument for propagating Western middle-class values. These are the major factors which restructure family morality and have the most effect in changing family economies from a situation in which high fertility is worthwhile to one in which it is disadvantageous. According to Caldwell (1982:303-305), these are the last two of five mechanisms through which education influences fertility. In countries where Westernized education systems prevail, the education to which the first generation with mass schooling is exposed has little to do with indigenous society and culture. Education serves as a mechanism which enables the schooled to gain a new social position and a new culture rather than to be prepared to work within the context of indigenous culture. Hence the first generation with mass schooling becomes the first major group exposed to a new familial culture through schools. Their schooling induces economic change since they are trained for capitalist production activities but not for traditional familial production activities. In fact, their parents' generation expect them to engage in capitalist production activities when they start to send more of their children to school (Dissanayake 1995).

The last generation of parents without mass schooling had the power to control the activities of the first generation with mass schooling, but they lost that power when the children completed their schooling because parents (and the society as a whole) recognize that the children possess valuable resources that their parents do not have. The first generation with mass schooling do not want to respect the traditional family morality which sustains family production because capitalist production is becoming the dominant mode of production. This reduces the parental and kin pressure on this generation and they become more independent. Once they are married, they leave their traditional homes and establish

separate family units because they are no longer considered part of traditional familial culture, but as part of the middle-class culture that they acquired from school.

When capitalism becomes the dominant mode of production, the first generation with mass schooling need to send their children to school in order to train them for such activities. Educating a child becomes a critical part of their culture. At this stage, it is obvious that increased schooling of their children (i.e. the second generation with mass schooling) influences them for the following reasons: first, it reduces the child's potential to work inside and outside the home; second, schooling increases the cost of children; third, schooling creates dependency, both within the family and within the society.

With schooling, the society regards the child as a future rather than present producer and it expects the family to protect the society's investment in the child for that future. These changes make school children less productive and more costly both to the family and to the society. These are the three mechanisms through which children's schooling has its effect on their parents (Dissanayake 1995). In the case of the last generation of parents without mass schooling, it was claimed that

When more children start to attend school, schooling becomes a short term economic burden on the family economy since school children are not regarded as present producers in familial production activities. The majority of the children of the family are unable to contribute to family income as a consequence of their schooling. In such a situation the intergenerational net wealth flow begins to reverse and starts to flow from parents to children. In this way many of the last generation of parents without mass schooling realise that a large family is a burden to the family's present economic survival. Eventually, a substantial minority of the couples in the last generation of parents without mass schooling (both better-educated and lesser-educated) control their fertility by the time that their children complete their schooling, which must be at least 15 years after the onset of mass education. This incidence of fertility control is at least sufficient for a country to signal the initiation of its marital fertility transition (Dissanayake 1995:310-311).

In the case of the first generation with mass schooling, the increased schooling of their children (i.e. the second generation with mass schooling) influences in the same way that it affected their parents' generation as discussed above. In such a situation, the net intergenerational wealth flow continues from the parents to children and it becomes irreversible. The first generation with mass schooling realize that low fertility is advantageous in order to sustain the capitalist production. At this stage fertility control behaviour is not a new phenomenon to the society because it has been already initiated by the last generation of parents without mass schooling. The availability of the means of fertility is of great importance when the majority of the society realize that high fertility is disadvantageous. In such a situation, a national family planning program can create an appropriate infrastructure to provide techniques of fertility reduction.

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Fertility decline in Bangladesh: toward an understanding of major causes *



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Abstract

Bangladesh has undergone a considerable decline in fertility, despite the absence of conditions believed to be necessary for such reproductive changes. Indeed, Bangladesh is the only one among the world's twenty poorest countries where such a change has occurred. The paper examines the nature of fertility transition in Bangladesh, looks at the trends in contraceptive use and fertility, and identifies the major factors accounting for the fertility decline, despite poor socio-economic conditions. Two types of factors in the decline are: (a) positive factors which encourage eligible couples to contracept, and (b) negative factors which compel women to contracept, for spacing or limiting births. The effects of positive and negative factors on contraceptive use and fertility are analysed with data from a rural sample of 4,194 women from the 1993-94 Bangladesh Demographic and Health Survey (BDHS), 2,597 women from the MCH-FP Extension Project area, and 8,110 women from the Matlab MCH-FP Project area. Logistic regression is used in the analysis. Strong and highly significant effects of female education, female employment and access to media on contraceptive use and fertility have been found.

Bangladesh is the ninth most populous country in the world. According to the 1991 Population Census, it had a population of over 111 million people, increasing at an annual growth rate of around two per cent (Government of Bangladesh 1991:6). Today, the country has an estimated population of over 120 million people. Except for some island states, Bangladesh has the highest population density in the world.

Resource scarcity and subsistence-level economic conditions characterize the Bangladesh economy (see Khuda 1991). Bangladesh is predominantly dependent on land, with agriculture as its primary industry¹. Increasing population pressure on the land, is continually decreasing the land-man ratio: from 49 decimals in 1951 to 20 decimals in 1991. Although high-yielding variety technology has expanded since the early 1960s, covering over one-quarter of cultivable land area, the per hectare yield is among the lowest in the world (Khuda, Barkat and Helali 1991).

* This study was funded by the United States Agency for International Development (USAID) under grant No. 388-0071-A-00-3016-00 with the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). An earlier version of the paper was presented at The Continuing Demographic Transition Seminar in honour of Professor John C. Caldwell, the Australian National University, Canberra, Australia, 14-16 August 1995. The authors are grateful to the key discussant, Dr. Steven Sinding, Director, Population Division, Rockefeller Foundation, and other seminar participants for their valuable comments and suggestions.

¹The share of agriculture in the GDP continues to be quite high, though its relative share has been declining over time, down to 37 per cent in 1988-89 from about 45 per cent in 1984-85. There is virtually no change in the relative share of industries in the GDP, remaining at only about 10 per cent (Khuda, Barkat and Helali 1991).

Socio-economically, Bangladesh is comparatively disadvantaged in terms of such key indicators as per capita income (US\$ 220 in 1991, World Bank 1993) and proportion living below the poverty line (78% of total population and 86% of rural population, UNDP 1994). Consequently, the Bangladesh economy is characterized by extremely low savings and investments. Both the per capita food production index and daily calorie supply as percentages of requirements (83%) are quite low in Bangladesh. The overall literacy rate is only 37 per cent: males 49 and females 23 per cent. Female school attendance is low, and there is an uneven ratio of male to female school enrolment, especially beyond the primary level (Khuda and Barkat 1992).

Life expectancy in Bangladesh continues to be quite low. Bangladesh is one of the few countries in Asia where female life expectancy remains lower than that of males. This is due in part to multiple high-risk pregnancies. The country is disadvantaged regarding access to health services (60% during 1985-91), safe drinking water and sanitation (32% during 1988-91), as well as with respect to both population-nurse (8,340 in 1990) and doctor-nurse ratios (0.8 in 1990) (UNDP 1994). Continued high infant and childhood mortality result from relatively weak prenatal and postnatal services, less than optimal birth spacing, and widespread malnutrition among children.

Despite pervasive poverty and underdevelopment, however, Bangladesh has achieved a considerable decline in fertility. Indeed, Bangladesh represents an apparent anomaly for its decline in fertility, despite the absence of conditions believed to be necessary for such reproductive changes. Bangladesh is the only country among the world's twenty poorest countries where such a change has occurred.

This paper examines the nature of fertility transition in Bangladesh.

Data and methodology

Three main sources of data were used in this analysis: various national surveys, particularly the 1993-1994 Bangladesh Demographic and Health Survey (BDHS); longitudinal data from the ICDDR,B Matlab Maternal Child Health and Family Planning (MCH-FP) Project Record Keeping System (RKS) and Demographic Surveillance System (DSS); and longitudinal data from the ICDDR,B MCH-FP Extension Project (Rural) Sample Registration System (SRS).

The MCH-FP Extension Project (Rural) is a collaborative effort of the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) and the Ministry of Health and Family Welfare (MOHFW) of the Government of the People's Republic of Bangladesh, supported by the Population Council. Its purpose is to improve the delivery of maternal and child health and family planning services through the MOHFW program.

The 1993-94 BDHS employed a nationally-representative, two-stage sample. A total of 8,168 rural households were selected for the sample, of which 7,798 were successfully interviewed. Of the interviewed rural households, 8,390 women were identified as eligible for interviews and the interviews were completed for 8,174 women. Of these 8,174 rural sample women, there were 4,194 who were married throughout the entire reference period² and they were included in the analysis while those women who were not married throughout the entire reference period were excluded from the analysis.

²The reference period used for the MCH-FP Extension Project and Matlab is ten years before 1994; however, a six-year reference period (1988-94) has been used for the 1993-94 BDHS because of non-availability of data preceding 1988.

The second data set was taken from the ICDDR,B Matlab MCH-FP Project.³ Since its inception, the Matlab MCH-FP Project has been collecting longitudinal data from its catchment area population on contraceptive use dynamics, immunization, through its RKS, and on demographic events such as births, deaths, migration, change in marital status through its DSS. A total of 8,110 married women of reproductive age who were married throughout the entire reference period were included in this analysis, while those who were not married throughout the entire reference period were excluded from the analysis.

The third data set was taken from the ICDDR,B MCH-FP Extension Project (Rural).⁴ Since its inception, the MCH-FP Extension Project has been collecting longitudinal data on demographic events as well as on selected variables to monitor the impact of the Project's different interventions on contraceptive use dynamics (see Mozumder et al. 1991). A total of 2,597 married women of reproductive age who were married throughout the entire reference period were included in the analysis, while those who were not married throughout the entire reference period were excluded from the analysis.

In addition to data on the two dependent variables, namely, contraceptive use and fertility, data on such selected client characteristics as education, age, religion, children born before the reference period, employment status, possession of a sealed latrine, possession of a radio, sources of drinking water, landholding, and electricity (in the case of the 1993-94 BDHS) were used.

The number of births to each woman during the reference period was calculated from all three data sets. Two categories of each dependent variable were used: no children born and one or more children born during the reference period, and use of any family planning method and never-use of any method during the reference period.

Data on children born before the reference period were excluded from Model II for each of the regressions in order to see the effect of other independent variables on contraceptive use and fertility, without controlling for the effect of children born before the reference period. Results presented in Tables 1 and 2 show no significant change, after excluding data on children born before the reference period from the model.

A composite score was developed, using almost all the covariates of each data set. The scores for the different variables were assigned as follows: education (no education=0, any education=1); employment status (housewife=0, other than housewife=1); sources of drinking water (tubewell=1, other than tubewell=0); possession of latrine (sealed latrine=1, other=0); possession of radio (yes=1, no=0); possession of land (no land=0, any land=1); and electricity (women belonging to households with electricity connected=1, and those without electricity=0). Other variables such as age of women, religion, and children born before the reference period were not used in building the composite scores. Scores of each individual variable were added to give a composite score, ranging from 0 to 6 for the ICDDR,B SRS and DSS, and from 0 to 7 for the 1993-94 BDHS. Using the composite score as an independent

³A major goal of the Project has been to assess whether a village-based maternal-child health (MCH) and family planning (FP) service delivery system can substantially reduce fertility and mortality in an unfavourable rural setting like Bangladesh. For more detailed description of the Project and area, see Bhatia et al. (1980), Phillips et al. (1982, 1984, 1988), and D'Souza (1986).

⁴Since 1982, the MCH-FP Extension Project has worked in close collaboration with the Government of Bangladesh to improve the national family planning and MCH service delivery system. The Project field sites are located in the rural *thanas* (subdistricts) of Sirajgonj and Abhoynagar in central and western Bangladesh respectively. In mid-1994, the Project opened a new laboratory area, Mirsarai Thana in Chittagong District. However, no data from Mirsarai Thana have been used in this paper, since there are no trend data as yet.

variable, logistic regression was carried out to see the effect of the composite score on the use of contraception as well as on fertility.

Selected variables and possible mechanisms of change in reproductive behaviour

Because of lack of data, it is not possible to examine the process through which each factor may have affected contraceptive use and fertility behaviour. This is planned for the second phase of the study, scheduled to begin around the middle of 1996. However, the possible mechanisms whereby the selected variables may have affected reproductive behaviour are discussed below.

Education

Although literacy continues to remain quite low in Bangladesh, it has shown some improvement over the years. Between 1973 and 1992, primary school enrolment increased by 48 per cent for boys (rising from 5,060,000 to 7,472,000) and for girls by over two times (from 2,698,000 to 6,245,000). During the same period, secondary school enrolment increased by 85 per cent for boys (from 1,343,000 to 2,480,000) and by over three times for girls (from 498,000 to 1,529,000) (Government of Bangladesh 1994).

How may female education have affected contraceptive use and fertility decline? There are at least three possible mechanisms of change: female education creates more favourable fertility attitudes and norms; it empowers women in household decision-making, including matters related to contraceptive use, fertility, children's schooling and health care; and it increases prospects of female employment.

Female employment

There has been an increase in the number of females in the workforce, both nationally as well as in the rural areas. However, there is also evidence of poverty-driven female employment, resulting from poor household economic conditions, high rates of female headships either *de jure* or *de facto* as a result of temporary male out-migration (Safilios-Rothschild and Mahmood 1989), and higher incidence of female headships among the poor and landless households (Bangladesh Institute of Development Studies 1990; Rahman and Hossain 1991). Rahman (1986) found that between 8 and 24 per cent of households in Faridpur and Tangail districts send their women in search of wage employment, and the proportion is much higher among poorer households: 50-77 per cent. The same study also found that there has been a rise in female employment since the mid-1970s, and argued that the pressures of poverty may have been critical in sending women out in search of work.

Female employment may have affected contraceptive use and fertility in at least three ways: female employment creates more favourable fertility attitudes and norms; it empowers women in household decision-making; and it increases opportunity costs associated with childbearing.

Access to mass media

Radio ownership has increased from less than ten per cent in the early 1970s to around 25 per cent in 1989 (Huq and Cleland 1990). The role of mass media, especially radio, in popularizing the family planning movement in many of the developing countries is widely recognized. The utility of radio is far greater than its price. Villages in Bangladesh are less isolated today, having been linked to the outside world by the mass media (Cleland et al. 1994). This linkage promotes diffusion of ideas not only about family planning but also about

lifestyles. The ideational hypothesis argues that reproductive behaviour is affected by such ideas (Cleland and Wilson 1987).

Access to safe drinking water and sanitation

Access to safe drinking water and improved sanitation has increased over time, though there is still considerable room for improvement.

Access to tubewell drinking water and to sealed latrines represents a status symbol in the rural areas. Also, they ensure better health for all, and thereby contribute to reduction in infant and child mortality, and hence, the desired family size. Furthermore, access to tubewells and sealed latrines reflects rising living standards and aspirations, and thereby raises the relative cost of bringing up children and reduces the economic utility of children.

Landownership

Increasing population pressure on the land is continually decreasing the land-man ratio, from 49 decimals in 1951 to 20 decimals in 1991. In the process, a large proportion of the rural population has been rendered functionally landless. Also, the average size of farms has diminished rapidly, from 3.5 acres in 1960 to less than two acres now (Government of Bangladesh 1994). Furthermore, there has been greater skewness in the distribution in farm size. Farms were divided evenly in the categories of small and medium farms in 1960, but in a span of two decades 70 per cent of holdings were in the small farmholding category (Huq and Cleland 1990). Indeed, the overall economic situation suggests that living standards for the vast majority have stagnated for most of the past three decades.

How have the worsening landholding situation and the overall economic condition affected reproductive behaviour in Bangladesh? It is likely to have been affected in least four ways: demand for labour in agriculture has been adversely affected; there has been a rise in rural unemployment and underemployment, affecting adults as well as children; there is a declining labour utility of children (plus increased direct costs of children, thus altering the economic value of children, and thereby, changing reproductive preferences); and a combination of near-stagnant real wages, shrinking farm sizes, chronic unemployment and underemployment, and deepening poverty may provide the conditions for a radical reassessment of the desired numbers of children.

Findings

The successive governments in Bangladesh have attached top priority to containing the rate of population growth and, accordingly, strengthened and intensified the family planning program efforts (see Khuda 1984; Khuda et al. 1991, 1992, 1993, 1994). This has resulted in a near-universal awareness of at least one family planning method as well as increasingly positive attitudes toward contraception. Between 1975 and 1993/94, ever-use of any method of family planning increased by about five times (Khuda et al. 1992; Khuda and Barkat 1994). During the same period, the national contraceptive prevalence rate (CPR) increased by about six times. The CPR in Matlab increased by about five times, and the Matlab CPR is considerably above the national average and that of the MCH-FP Extension Project areas (Figure 1).

Figure 1
CPR In Bangladesh: 1975-94

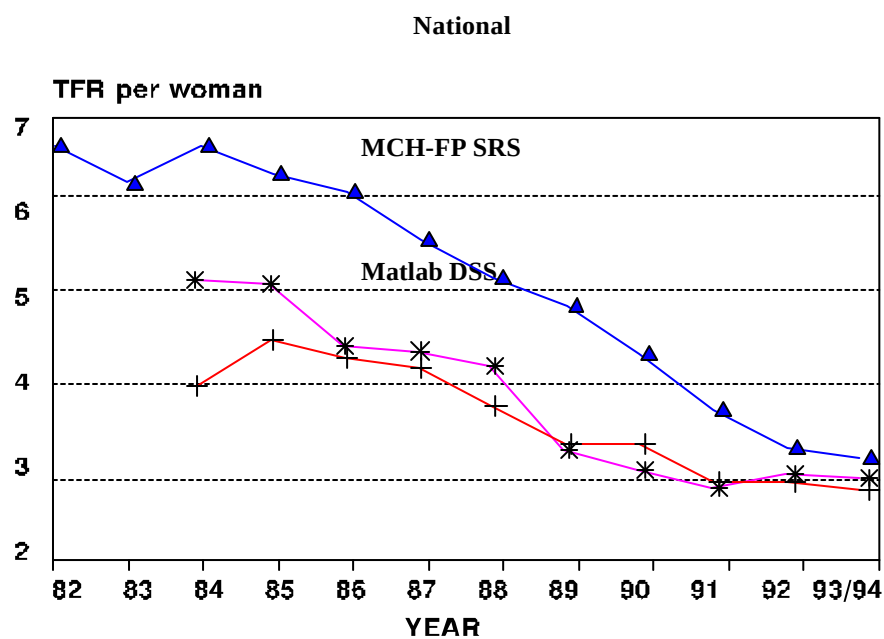
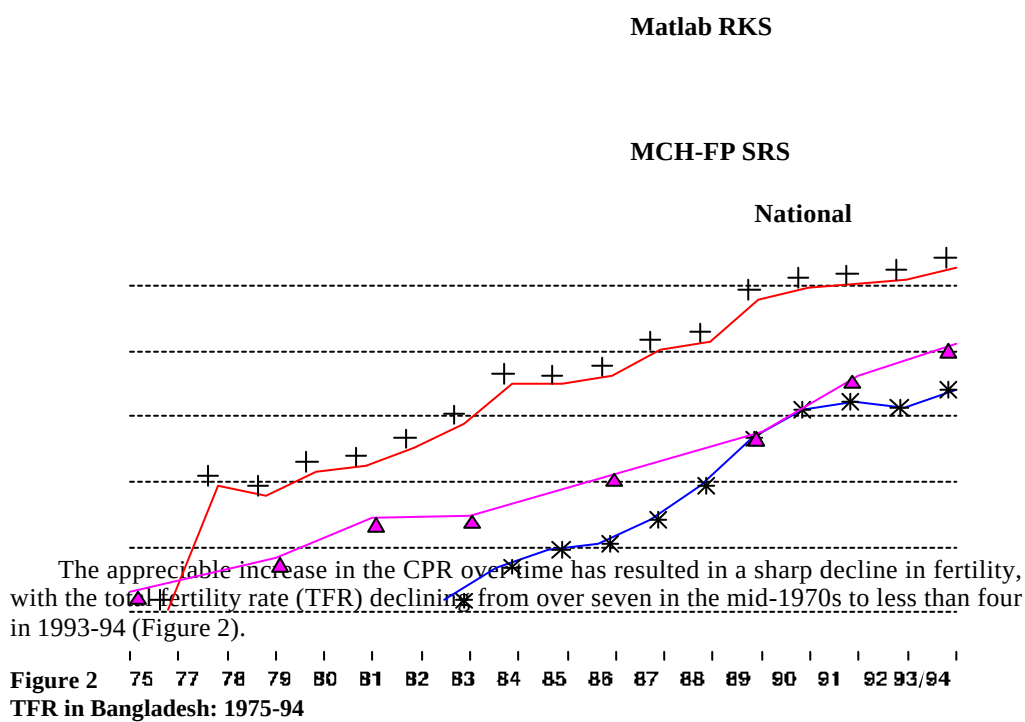


Table 1**Logistic regression estimates of the odds ratios (OR=exp(B)) of characteristics of married women of reproductive age on contraceptive use in Bangladesh**

Characteristics	1993-94 BDHS		MCH-FP Extn		Matlab MCH-FP	
MCH-FP	Model I	Model II	Model I	Model II	Model I	Model II
<u>Education</u>						
No education (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Primary	1.68***	1.66***	1.98***	1.95***	1.42**	1.44**
Above primary	2.31***	2.06***	2.37**	2.06*	1.52*	1.27
<u>Age of Women (in years)</u>						
< 25 (RC)	1.00	1.00	1.00	1.00	1.00	1.00
25 - 29	0.91	1.36***	0.44***	0.90	0.48***	1.19
30 - 39	0.69**	1.39***	0.18***	0.56***	0.16***	0.84
<u>Religion</u>						
Muslim(RC)	1.00	1.00	1.00	1.00	1.00	1.00
Hindu and others	1.20	1.15	1.50*	1.33	1.53**	1.47*
<u>Employment status</u>						
Housewife (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Other than housewife	1.62***	1.63***	3.22	3.29	1.09	1.17
<u>Possession of latrine</u>						
Sealed latrine	1.23*	1.20	1.02	1.09	1.07	1.13
No sealed latrine (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<u>Source of drinking water</u>						
Tubewell	1.39**	1.36**	1.59***	1.60***	1.22	1.23
Other than tubewell (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<u>Possession of radio</u>						
Yes	1.45***	1.43***	1.73**	1.75**	1.10	1.04
No (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<u>Land ownership</u>						
No (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.14	1.14	0.79*	0.80*	1.01	0.99
<u>Electricity connection in household</u>						
No (RC)	1.00	1.00	a	a	a	a
Yes	1.05	1.08	a	a	a	a
<u>Children born before reference period</u>	<u>1988</u>		<u>1984</u>		<u>1984</u>	
0 (RC)	1.00	-	1.00	-	1.00	-
1 - 2	2.06***	-	2.14***	-	3.42***	-
3 - 4	3.56***	-	5.32***	-	12.80***	-
5+	3.18***	-	7.56***	-	19.76***	-
-2log likelihood	4911***	5011	2120***	2189***	3068***	3262**
N	4194	4194	2597	2597	8110	8110
df	14	11	13	10	13	10
Other coefficient of the model:						
Intercept	-0.62***	-0.20	0.76***	1.44***	1.70***	2.64***

* p< .05; ** p< .01; *** p< .001

^aData not obtained

Source: Calculated by the authors from three different data sources as mentioned above.

Table 2
Logistic regression estimates of the odds ratios (OR=exp(B)) of characteristics of married women of reproductive age on the proportion who have not had any birth during the reference period in Bangladesh

Characteristics	1993-94 BDHS		MCH-FP Extn		Matlab MCH-FP	
MCH-FP	Model I	Model II	Model I	Model II	Model I	Model II
<u>Education</u>						
No education (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Primary	0.98	0.98	1.49**	1.50**	1.30***	1.32***
Above primary	0.97	0.91	1.71**	1.72**	1.75***	1.68***
<u>Age of Women (in years)</u>						
< 25 (RC)	1.00	1.00	1.00	1.00	1.00	1.00
25 - 29	1.71***	2.08***	3.36***	3.19***	4.44***	5.61***
30 - 39	3.86***	5.82***	7.63***	6.79***	15.64***	25.63***
<u>Religion</u>						
Muslim(RC)	1.00	1.00	1.00	1.00	1.00	1.00
Hindu and others	1.51***	1.45***	2.12***	2.15***	2.13***	2.08***
<u>Employment status</u>						
Housewife (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Other than housewife	1.40***	1.40***	2.68*	2.70*	1.63*	1.53
<u>Possession of latrine</u>						
Sealed latrine	1.11	1.09	1.38**	1.37**	0.87	0.89
No sealed latrine (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<u>Source of drinking water</u>						
Tubewell	0.71**	0.71**	2.39***	2.38***	0.88	0.88
Other than tubewell (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<u>Possession of radio</u>						
Yes	1.50***	1.49***	1.16	1.16	1.02	1.02
No (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<u>Land ownership</u>						
No (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.02	1.03	0.78*	0.78*	0.98	0.97
<u>Electricity connection in household</u>						
No (RC)	1.00	1.00	a	a	a	a
Yes	1.02	1.03	a	a	a	a
<u>Children born before reference period</u>						
0 (RC)	1.00	-	1.00	-	1.00	-
1 - 2	2.06***	-	2.14***	-	3.42***	-
3 - 4	3.56***	-	5.32***	-	12.80***	-
5+	3.18***	-	7.56***	-	19.76***	-
-2log likelihood	4653***	4688***	2516***	2519***	6593***	6661***
N	4194	4194	2597	2597	8110	8110
df	14	11	13	10	13	10
Other coefficient of the model:						
Intercept	-1.93***	-1.82***	-2.82***	-3.08***	-3.03***	-3.51***

* p< .05; ** p< .01; *** p< .001

^aData not obtained

Source: Calculated by the authors from three different data sources as mentioned above.

Tables 1 and 2 show the logistic regression estimates of odds ratios for the effect of selected characteristics of married women of reproductive age on contraceptive use and fertility respectively. Odds ratios (OR) are shown in place of regression coefficients for easy interpretation of results. An OR below 1.00 means a negative effect of an independent variable, while an OR above 1.00 means a positive effect. The first two panels, second two panels and third two panels of the table respectively give the results based on data from the 1993-94 BDHS, the MCH-FP Extension Project, and the Matlab Project. The results are in the expected direction for most variables.

The probability of contraceptive use rises with education. It is higher among working women than among housewives, among women belonging to households with sealed latrines than those without, among women belonging to households using tubewell for drinking water than those without, among women who belong to households having radios than those without, and among women belonging to households with electricity connections than those without. There is little or no effect of landholding on contraceptive use, indicating that the probability of using contraception is almost the same among the landed as well as the landless, implying poverty-led demand for contraception among the poor. Also, it is possible that there is some aspiration-led demand for family planning among the poor, resulting from access to media and ideational changes.

The probability of not having given birth during the reference period is higher among the educated than non-educated women, among working women than among housewives, among women belonging to households with sealed latrines than those without, among women belonging to households with radios than those without, and among women belonging to households with electricity connections than those without. Similarly to what has been observed with regard to contraceptive use, there is little or no effect of landholding.

Table 3
Logistic regression estimates of the odds ratios (OR=exp(b)) of composite score on any family planning method use during the reference period

	DSS/RKS	1993-94 BDHS	MCH-FP Extn. SRS	Matlab DSS/RKS
Score		1.37***	1.33***	1.13***
Other coefficient of the model:				
Intercept		0.01	1.12	2.65

* p< .05; ** p< .01; *** p< .001

Source: Calculated by the authors from three different data sources as mentioned above.

Tables 3 and 4 show the logistic regression estimates of odds ratios for the effect of composite score on contraceptive use and fertility respectively. Results show that the probability of contraceptive use increases by varying proportions (13-37%) for a unit change in the composite score for the three data sets. Also, results show that the probability of not having given birth during the reference period increases by varying proportions (9-35%) for a unit change in the composite score for the two data sets; however, the reverse is true, though not statistically significant, for the Matlab data.

Table 4
Logistic regression estimates of the odds ratios (OR=exp(b)) of composite score on the proportion of women who have had no birth during the reference period

DSS/RKS	1993-94 BDHS	MCH-FP Extn. SRS	Matlab DSS/RKS
Score	1.09***	1.35***	0.97
Other coefficient of the model:			
Intercept	-1.05	-1.73	-1.21

* $p < .05$; ** $p < .01$; *** $p < .001$

Source: Calculated by the authors from three different data sources as mentioned above.

Discussion

Bangladesh is the best example of a country with a strong family planning program effort which has brought about a significant fertility decline, even when social and economic development is at a low level and not improving much. Bangladesh ranks low on almost every social and economic development indicator. Nevertheless, an intensive family planning program has been followed by a substantial increase in the use of contraception and the consequent fertility decline. The speed with which reproductive behaviour changed in Bangladesh, especially in the absence of much parallel change in social and economic development in the country, strengthens the argument that the family planning program has had a considerable influence on fertility decline (Freedman 1995). The Bangladesh case has, no doubt, strengthened the argument that a strong family planning program can make a positive contribution to the process of demographic transition. Already, there is evidence of the impact of family planning programs on contraceptive use dynamics (Phillips, Hossain and Koblinsky 1989; Phillips et al. 1993; Hossain, Phillips and Haaga 1994). A more pronounced effect is observed when standard quality of care is ensured (Hossain, Khuda and Phillips 1995). The evidence from Bangladesh has, therefore, challenged conventional demographic transition theory, which generally associates fertility decline with economic development. Accordingly, population scientists are trying to understand the factors that have contributed to this change in Bangladesh.

Female education has emerged as the single most important variable affecting both contraceptive use and fertility regulation. Indeed, the powerful effect of education on reproductive behaviour is undisputed. Data from the World Fertility Surveys and the Demographic and Health Surveys confirm the strong positive effect of education on reproductive behaviour (Schultz 1994; World Bank 1994). Similar evidence is also available from other studies (e.g., Cochrane 1979; Caldwell 1980; Jejeebhoy 1992). Other positive factors accounting for reproductive change in Bangladesh include female employment as well as access to safe drinking water, sanitation, and the media (radio). The evidence indicates that improvement in women's status is a critical determinant of fertility decline in Bangladesh. Most Bangladeshis and foreign observers agree that during the past two decades women's status in terms of education, employment, mobility, and decision-making power has undergone major changes. Also, there is evidence that such changes have contributed to increased contraceptive use and consequent fertility decline (Khuda et al. 1990; Khuda and Barkat 1992). Access to safe drinking water and sanitation can be argued to have had some effects on infant and child mortality, and therefore, on fertility decline. Ideational changes resulting from increased access to the media have fostered modern outlooks and attitudes, thereby lowering high-fertility norms, even among the poor. Furthermore, landlessness and impoverishment have altered the economic value of children, especially sons. Consequently, there is evidence of a poverty-led demand for contraception.

The findings have clear policy implications. The government of Bangladesh should further strengthen its family planning program efforts to accelerate the rate of fertility decline to be able to achieve replacement-level by the year 2005. While achievement of replacement-level fertility by the year 2005 would be difficult, it would not be impossible, given considerable unmet need for contraception and decline over time in the mean ideal family size. One-fifth of married women in Bangladesh have an unmet need for contraception: 10 per cent for spacing and 9 per cent for limiting births. The mean ideal family size was 2.5 children in 1994, a sizeable decline from 4.1 in 1975 (Mitra et al. 1994). Also, data from Matlab show a decline in the mean ideal family size from around 4.5 in both the treatment and comparison areas in 1975 to around 3.2 in 1990 (ICDDR, B 1994). There is now little reason to doubt that there is substantial demand for contraceptives and that supply-side approaches are having net demographic effects in Bangladesh (Phillips et al. 1982; 1988). Nevertheless, while vigorously pursuing family planning program efforts, the government should attach greater priority to development in the social sector, including enhancement of women's status, especially through increased female educational and employment opportunities; and improved access to the media. Such efforts, in addition to their direct benefits, would accelerate the process of fertility decline in the country.

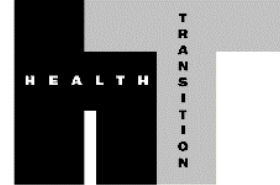
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Shifting boundaries of fertility change in Southwestern Nigeria *



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Abstract

Anthropologists and demographers rely on distinctive methodologies and forms of evidence even while they share a common interest in explaining fertility change. This paper proposes a cultural anthropological approach that focuses on the process whereby meanings associated with practices and things are reinterpreted over time. Using the image of shifting boundaries of kinship relations, it examines changing interpretations of three fundamental aspects of social life—family land, marriage, and foster parenthood—in the Ekiti area of Southwestern Nigeria which suggest an attenuation of the mutual obligations of extended kin. While these reinterpretations have moral associations that legitimate practices supporting fertility decline, political and economic uncertainty may counter this process.

Ojo ti won ba mu ile, ni won un mu gbe

The day you begin to cultivate land, then you will know the boundaries (Yoruba proverb)

In explaining processes of demographic change, it seems that a contribution could be made by anthropologists who investigate the logic of cultural practices and the transformation of associated meanings under changing social, economic, and political conditions. Yet there are difficulties in integrating anthropological and demographic perspectives. One recent approach to the study of fertility, which attempts to combine demographic research on fertility change with

* Research for this study was originally conducted under the auspices of the joint research project of the Faculty of the Social Sciences, Ondo State University, Ado-Ekiti, and the Health Transition Centre, The Australian National University, Canberra, with funding from the Mellon Foundation. I would like to thank Pat and John Caldwell, Gigi Santow, I.O. Orubuloye and colleagues at Ondo State University, Ado-Ekiti, and Dejo Abdulrahman, Ahmadu Bello University, Zaria, for suggestions and assistance. I am also most grateful to His Royal Highness, the Owatapa, for continued support my work in Ekiti, to Comfort Ajayi, Kayode Owofe, Adenike Oso, and Sunday Falodun for research assistance, and to Wendy Cosford for editorial advice.

the specifics of anthropological explanation, has been termed by demographers 'micro-demographic analysis' (Caldwell, Hill and Hull 1988). While demographers and anthropologists may be interested in interdisciplinary approaches to events of mutual concern such as birth,

marriage, and death, they have distinctive disciplinary perspectives, both theoretical and methodological (see Bledsoe and Pison 1994), on these topics, which discourage collaborative work. Demographers often derive their conclusions from large-scale survey data and statistical analysis, focusing on isolating specific variables which can be statistically correlated, whereas anthropologists tend to support their own studies with detailed material acquired through personal, long-term field research, analysing particular phenomena within their broader cultural, social, political, and economic context. How to reconcile these differences in scale and in the evaluation of evidence is perhaps the most difficult question facing those interested in interdisciplinary approaches to these two fields today.

Part of the problem in formulating an interdisciplinary approach is that there are various schools of anthropology, each divided into several subdisciplines. Embedded within the various anthropological subdisciplines are distinctive interpretations of culture which have important implications for demographic applications. Carter (1988:164) classifies these definitions into two groups: conceptions of culture as a set of overarching ideals and beliefs at the societal level, external to human action, and conceptions of culture as a set of ideals and beliefs which are actively engaged by individuals and internal to individual human action. Carter argues, as will I, that culture is most usefully conceived as ideals and practices which inform human behaviour but are also shaped by human actions.

The difficulties of integrating an anthropological approach to demographic studies, then, are not just a problem of demographers and anthropologists sparring over theory and method (Caldwell, Caldwell and Caldwell 1987) but are also related to differences of perspective among anthropologists themselves. Intradisciplinary disagreements within anthropology, for example, whether it is a humanistic or scientific endeavour, as well as changing theoretical fashions, have made it difficult for even well-intentioned demographers to grasp exactly what demographic anthropology would entail. While the methodologies and analytical concerns of demography and anthropology differ considerably, there is a striking familiarity in some of the intradisciplinary squabbles—between those who argue over economic or biological or ideational explanations, for example—and lamentations over lack of theory. In their complaints and divisions, anthropologists and demographers share some common ground.

What follows is an attempt to formulate an anthropological approach which complements demographic research on fertility change based on field research in Southwest Nigeria and reflecting my own perspective as a cultural anthropologist. Specifically, I suggest an ethnographic focus on culture¹ as beliefs, practices, and things that not only structure individuals' and groups' sense of their world but which also provide the means for individual strategies of reinterpretation. Culture is viewed as part of a continual process in which the reproduction of structure—represented by prevailing social organization, institutions, and associated moral values—coexists along with practice, reflected in the re-evaluation and reconstruction of these structures. This conception of culture derives from the writings of sociologists such as Elias (1978), Schutz (1970), and Bourdieu (1977), and of anthropologists such as Beidelman (1986), Moore (1986), and Jackson (1989). For them, the pertinent questions are: what are the meanings and moral

¹ The Latin root of the word 'culture', *colere*, means to inhabit a town or cultivated space, and refers to a range of human activities including ploughing, 'adorning the body, caring for and attending to friends and family, minding the gods, and upholding custom through the cultivation of correct moral and intellectual disciplines' (Jackson 1989:120). There are other anthropological interpretations of the word 'culture'; for summaries of others in a somewhat chronological order, see Hammel 1990:458-466.

valences associated with particular events, things, and practices? And by what processes do these interpretations change in specific historical, political, and economic contexts? These questions are important not only for clarifying the meaning of such general terms as 'modernization' and 'education'², often cited in explanations of fertility change, but also for addressing the concerns of those who argue that diffusionist explanations of fertility change do not adequately explain the process whereby local acceptance and incorporation of new ideas and practices occur in the first place (Kreager 1993).

The paper does not purport to be an exhaustive cultural analysis of all aspects of fertility change in an Ekiti Yoruba village in Southwestern Nigeria. Rather it suggests one approach to the study of fertility change that also relates to questions raised by demographers and anthropologists interested in cultural aspects of this process (Caldwell 1977b; Kreager 1986).

Cultural analysis of demographic change

According to Macfarlane (1978:48), 'anthropologists' main contribution [to demographic anthropology] is to show that beliefs and attitudes are fundamental and have a life of their own'. In his essay, 'A Theory of Culture for Demography', Hammel (1990) has taken up this point, proposing one such approach to the study of culture in demographic analysis. He suggests a particular interpretation of culture, one represented as 'a negotiated set of understandings' by social actors whose 'evaluative behaviour' is grounded in a set of more general social values and structures. Further:

Emerging from the concept of culture as a transitory and negotiated set of understandings is the view that behavior is controlled by its own symbolizations. It is the evaluative behavior of actors, playing unceasing variations on themes provided by their current cultural stock [e.g., historical ideas concerning social organization, religious practice, marriage, etc.], that creates and recreates culture as a constantly modified and elaborated system of moral symbols (Hammel 1990:467).

This definition appears to merge the idea of culture-as- overarching-ideals at the societal level with that of culture-as-human- practice at the individual level, a dichotomy discussed by Carter (1988:164), through the incorporation of both general cultural ideals ('cultural stock') and individual 'evaluative behavior' (and presumably practices) into his analysis.

By defining and contextualizing 'the network of social actors directly involved in processes that have demographic import' Hammel (1990:468) seeks to bridge the gap between explanations which attribute demographic change to social structural factors and explanations which attribute demographic change to individual motivation. Hammel (1990:474) argues that these social networks may also be used to link individuals with wider regional and national level institutions which would allow for the integration of micro- and macro-level analysis within his model.³ This

² For example, Peel (1978) examines the Yoruba term *olaju*, most closely associated with Western notions of 'development' in order to understand local interpretations of this phenomenon.

³ Just how these two levels of analysis would be conjoined is not made clear. His alternative to fieldwork (i.e., a study gleaned from survey data and ethnographic literature) used for the sort of micro-analysis he proposes, seems an unlikely substitute and is probably unworkable. Fricke (1986), for example, noted that certain household configurations only became clear to him after working in a village for several months; it is unlikely that these very culturally specific social units would be evident from survey data.

approach would optimally involve fieldwork, with emphasis on a few fine-grained case studies of the social networks of selected individuals, such as women who use contraceptives and their network of family, friends, and acquaintances. Once these networks were established, individuals could then be questioned about their evaluation of particular events or disputes related to demographic questions.

My own approach to demographic anthropology is similar to that taken by Hammel (1990), which focuses on 'culture as negotiated symbolic understanding', although I would stress that these 'understandings' are evident in people's everyday practices and use of things as well as in what they say, their 'intensely evaluative cloud of commentary' (Hammel 1990:467). The process whereby these mundane practices, things, and events, grounded in underlying social structure, are reinterpreted and associated with particular moral meanings over time (see Moore 1987) is at the heart of my conception of anthropological demography. This approach is better explained using material from my work on fertility change in rural Southwestern Nigeria.

Fertility change and shifting boundaries of kinship

Caldwell (1977a,b, 1982) has examined the ways that a particular form of social organization, the patrilineal descent group, has supported high fertility in Southwestern Nigeria. Having many children provides prestige and a sense of security in that one's patrilineage will continue in time. Many children provide domestic labour and potential financial assistance in old age and to a range of relations, linking kin groups⁴ from whom social and economic support can be expected. Fertility will decline, it is argued, when the mutual claims of and obligations to patrilineal and matrilineal kin are restricted, and nuclear family bonds, between husband and wife, between parents and children, are strengthened (Caldwell 1977b:15).

Caldwell uses the metaphor of the breaking of a chain letter to characterize the crumbling of this system of mutual obligations of kin relations. In my own case, I use the metaphor of shifting boundaries to characterize this process of attenuation of kinship obligations and claims. In strengthening conjugal bonds, for example, the boundaries of parental claims on the behaviour of their children may be restricted. This shift in the boundaries of intergenerational authority is further supported by moral justification as when young people depict arranged marriage as 'unenlightened' behaviour. An examination of these processes of re-evaluation and the ways that people rationalize their behaviour is an important part of explaining fertility decline (Caldwell 1977b:16).

Further, examining the reinterpretations of these three aspects of social life, family land, arranged marriage, and foster-parenthood, in terms of boundaries stresses the interconnectedness of changing ideas and practices which should be viewed as 'composing a moving configuration rather than [as] a set of static variables' (Guyer 1994:239). Thus the idea that one should survey one's property and encompass it with walls is not unrelated, I suggest, to the idea of refusing to have one's children fostered. Furthermore, the processes whereby kinship boundaries and fertility are being reassessed, in turn, reflect wider political and economic forces (Greenhalgh 1990:87) in

⁴ The rather imprecise term, kin, is used here to refer to both patrilineal (through one's father) and matrilineal (through one's mother) family relations.

contemporary Nigeria which cannot be ignored. The ways that present-day political and economic uncertainty intersects with these processes are discussed at the paper's close.

The Ekiti village study

This paper on the boundaries of kinship relations and on fertility change derives from a study conducted in one Ekiti Yoruba village located northeast of Ado-Ekiti in Ondo State from June 1991 to April 1992, with follow-up visits in October 1993 and December 1994. At the time of the census survey in 1991, approximately 3,500 inhabitants permanently resided in the village, these numbers being bolstered during holiday periods. The village has various modern improvements, including infrastructure for piped water and electricity, three primary schools, one secondary school, a post office, a police station, a maternity clinic, a town hall, a new community bank, and a hospital, jointly constructed with a neighbouring town.

At present, men are predominantly farmers and women are traders although many today combine this work with semi-skilled occupations such as carpentry and hairdressing, practised on a part-time basis. Many Ekiti women and men have some secondary education and those with secondary school certificates or higher education may be employed in local schools and government offices in nearby towns. Although relatively isolated in the past, the village is now located along a paved federal highway, facilitating villagers' travel throughout the area and to urban centres elsewhere in Nigeria. Thus while this Ekiti village has its own distinctive history, it nonetheless is representative of villages of comparable size and location in the Ekiti area more generally.

The study began with a village-wide household census and map preparation, followed by a series of open-ended interviews of 70 women (aged 15-39) and 66 men (aged 20-44) selected by age and availability, on attitudes toward family planning and government population policies, use of birth control methods, and associated health concerns. These interviews were later followed with a fertility survey of 300 women and 302 men and open-ended questionnaires based on particular topics such as child-fostering and burial practice. More information on methodologies used and study results is given elsewhere (Renne 1993a,b,c, 1995, 1996a).

From the census and initial interviews, I was able to identify several local events and practices that seemed to highlight change, suggesting that 'some pattern of local replication [was] being broken' (Moore 1987:730). Changes associated with three primary aspects of social life—land, marriage, and parenthood—implied the sort of break with the past that Moore had in mind. The first change concerned family houses and houseplots, in particular, a shift from transfers of family houseplots among kin to cash-based transactions among non-kin. This change is reflected in new patterns of houseplot boundary markings (Renne 1995).

The second change concerned the demise of arranged marriage evidenced by the present-day disregard for premarital virginity (Renne 1993b, 1996b). This change is related to beliefs about the relationship between virginity and fertility, which in turn reflect ideas about paternal control of women's bodies and marriage.

The third change centred on the practice of child-fostering and the belief held by some younger villagers that birth parents are best suited to raise their children (Renne 1993a). Conflating close blood ties with moral parenthood, it appears that more diffuse definitions of shared blood among extended kin are being altered in favour of more restrictive definitions of closeness of kin.

To investigate these changes in more detail, follow-up surveys of houseplot transfers, of premarital virginity, and of child-fostering were carried out, providing quantitative data on these topics. Qualitative information was obtained from involved individuals who were questioned for their explanations of what had happened. This approach would not preclude the study of social networks as suggested by Hammel (1990). However, the ways that individuals support their 'ongoing contests and conflicts and competitions and the efforts to prevent, suppress, or repress these' (Moore 1987:730) would also be stressed. I am particularly interested in the ways that different social actors (e.g., young and old, women and men, farmers and government officials), who may have different stakes in what is represented as 'orderly' social relations, evaluate these events and explain their actions. Their different representations, which in turn help to define the moral high ground, may be used to justify their particular positions relating to fertility behaviour. These distinctive interpretations and their association with shifting boundaries of kinship and of houseplots, virginity, and child-fostering are examined in more detail in the following sections.

Shifting boundaries of houseplots and patrilineal obligations

In this rural Ekiti village, land is held communally, with particular patrilineages in control of certain allotted portions of both farm and village land. Access to land for farms and for family houses depends on ties with kin, a situation supporting the mutual obligations of extended family members. Men's practice of building a house on family land in the village reinforces this connection of patrilineage with land. The house is then occupied by a man's sons and their wives and increasing numbers of children, representing the social ideal of patrilineal continuity in time and expansion in space. The importance of the large patrilineal house peopled by many descendants and other kin would seem to be, as Olusanya (1989:89) has suggested, one of the primary supports for high fertility in the Ekiti Yoruba area.

The word for house in the Ekiti dialect is *ule* which may also be translated as compound, referring to the physical structure of the building itself. Traditionally, Ekiti Yoruba houses are square or rectangular structures with a central corridor, surrounded by individual rooms each with its own doors and locks which open into this general space. The word *ule* (house) also suggests a core group of people who claim membership by virtue of patrilineal descent from a common ancestor as well as other residents within the compound who may or may not be related to this core group. Barber (1991:155) has observed that the social obligations of co-residents associated with attendance at various rituals are critically important because they constitute a sense of 'one's "people" and without a solid background of people one is socially non-existent'.

Several villagers expressed this fear of social non-existence and their need for descendants, particularly sons, in terms of the empty house, described by one 26-year-old Ekiti man who wants six children:

My problem is so transparent in that I am the only son for my parents. As a result of this, I want some boys so that our house foundation can be laid on rocky land. We can have more men in our house because no matter how rich the female children may be, they will tilt their wealth more to their husbands' houses than to their father's house. I don't want our house to become desolate.

Implicit in the image of the abandoned, desolate house is the idea of the individual in society without social support and identity. Thus the house is a place to live but it also the site of the social reproduction of the patrilineage.

The ideal of a house headed by a man and his subsequent male descendants as well as a preference for virilocal residence after marriage has been reinforced by practices which symbolically represent patrilineal continuity, as in the burial of the dead and in childbirth procedures. Until the 1940s with the advent of maternity hospitals and clinics in the area (Ekiti Division Files 1945), rural Ekiti women gave birth to children in their homes. At present, the majority of village women go to the local maternity clinic or hospitals in neighbouring towns.⁵ This shift to non-home birth is also reflected in the demise of another traditional practice, the burial of the placenta and umbilical cord in the proximity of the child's father's house (Verger 1973). While it is not clear when this practice ceased (perhaps around the time women began attending maternity clinics), according to one woman herbalist-diviner:

The umbilical cord that is cut would be given to the woman who gave birth to the baby or her husband before. We usually put it inside an *apadi* (pot), then would dig the ground as if it were a corpse and gently bury it there.

Yet if the practices of home childbirth and the burial of patrilineal substance—the placenta and umbilical cord—near the family house have disappeared, the practice of burying the dead in its proximity has not.⁶ In rural Ekiti villages, houses themselves serve as a sort of family monument, where the family name may be inscribed above the doorway and the bodies of the deceased owner of a house, his wives, and their male children are often buried near the house. Their graves are covered with a cement slab with the name and date of the burial written on top. This material evidence—the house, graves, and formerly, placentas and umbilical cords—of the births and deaths of family members reflects traditional religious beliefs about the cyclical nature of birth and rebirth. In the houses were buried the bodies of ancestors, who might potentially intervene for the well-being of household members, and whose spirits might be reborn in a child (Eades 1980:122) born in the house.

However, the continuing practice of home burial also emphasizes the importance of a physical association of descendant generations with particular plots of land, serving as material evidence of people's right to build and reside there. Indeed, the concern with ancestral spirits is at present less persuasive for many villagers who have converted to Christianity and Islam. Their concern with building and maintaining a family house has as much or more to do with male descendants who will inherit a house, perpetuate its founder's name by their presence and importantly, help to maintain or extend claims to land. Thus the cultural importance of the house as the symbolic embodiment of a social group, the patrilineage, also coincides with the economic consideration that a viable house with relatives buried within can be critical in establishing claims to family land.

⁵ For example, of the 33 survey women who gave birth in 1991, only 15 per cent (n=5) gave birth to children in their houses. Eighty-two per cent (n=27) of those who gave birth that year did so in local maternity clinics and hospitals.

⁶ Of the 283 occupied houses surveyed in the village census, 58 per cent have visible graves present, usually as part of the front porch of the house.

Houseplot land is acquired for the building of houses from older members of the patrilineage who control land in certain areas of the village.⁷ Once land has been allocated and a house built, the house owner, generally a male of the patrilineage, his descendants, and other kin, friends, tenants, etc. may reside there in perpetuity. Tenure of the plot on which the house is built, however, refers only to use rights as the land continues to belong to the patrilineage. Houseplots with abandoned, collapsed houses which are not immediately rebuilt revert to the patrilineage.

This lack of finiteness in houseplot ownership in time is also reflected in space, specifically in the negotiability of houseplot boundaries, often marked by impermanent things such as plants or broken pots (Table 1). The practice of shared patrilineal land without permanent, well-defined houseplot boundaries represents the ideal of generous sharing among kin, reflected in the non-remunerative partitioning of land as well as the practical strategy of potential expansion for land claims (Lloyd 1962:87). The moral ideal of kin sharing resources and helping one another without the use of impersonal money continues to be expressed in one man's remark regarding houseplot boundaries: 'There are no boundary marks since this land belongs to family'.

However, despite the continuing practice of unmarked houseplot boundaries and transfer of land through family ties, there is also the sense, as one villager put it, that 'Now everything is cash'. At present, houseplot land, particularly choice sites adjoining the main road, may be acquired from non-family members with cash. Such transactions, however, are a relatively recent occurrence, with 75 per cent having taken place within the last 20 years; they are also relatively uncommon. Only 13 per cent (n=43) of the 333 recorded houseplot transactions in the village include cash payments for land whereas 49 per cent (n=162) of transactions consist of the division of family land (Renne 1995). Nonetheless, these cash-based transactions represent a significant change in the way that houseplots are acquired in this Ekiti village.

Not surprisingly, the shift in types of houseplot transaction, from those made between kin and those made with cash, is also reflected in changes in boundary markings, from impermanent markers to those cast in concrete in the form of walls. People who have paid cash to acquire houseplots may also get land surveyed and then erect survey pillars at the four corners (Table 1). Indeed, houseplots transacted with cash are more frequently surveyed than non-cash family land houseplots. These changes suggest a tendency toward the commoditization of houseplots, undermining the idea of the family house built on a shared, unbounded space.

Table 1
Land boundaries and surveys by land transaction types

Type of boundary	Type of transaction					
	Cash %	No	Family %	No	Not family %	No
Trees						

⁷ Another type of houseplot transfer common in the village but not discussed here was non-cash transactions between non-patrilineal kin and friends (see Table 2) that nonetheless required some expense as things such as cases of beer, kola, and metal sheeting might be required (see Renne 1995).

<i>Lapa lapa</i> , etc. ^a	2	1	15	25	10	13
<i>Porogun</i> ^b		--	7	11	10	13
Other kola, etc.	5	2	9	15	16	21
Total	7	3	31	51	36	47
Non-traditional markers						
Pillars	30	13	7	12	8	10
Walled	28	12	1	2	3	4
Pegged	5	2	3	5	3	4
Total	63	27	11	19	14	18
Roads, paths, etc.	9	4	12	20	9	11
Stones		--	1	2	3	4
Four holes at corners		--		--	3	4
Bottles, ashes	2	1	1	1	2	2
Neighbouring houses	5	2	4	6	5	6
House to boundary	2	1		--	1	1
Swept area		--	1	1	3	4
Nothing	5	2	28	45	17	22
Data missing	7	3	11	17	7	9
Surveyed						
Yes	60	26	19	31	10	13
No	33	14	74	120	83	106
Data missing	7	3	7	11	7	9
TOTAL	100	43	100	162	100	128

^a *Lapa lapa* trees [*Jatropha curca*] as well as *ajekobale* ('witches do not land on it') [*Croton amabilis*], *alabose*, and *odan* [*Ficus thornigiri*] trees were commonly mentioned.

^b *Porogun* trees [*Dracaena fragrans*] are 'often planted in fetish groves' Abraham 1962:551. See also Abraham 1962:622 for use of *porogun* in rituals associated with the thunder deity, Shango. The use of this plant suggests that spiritual protection was more important than permanence of boundary markers.

Thus village land formerly reserved for family members and clients to bolster the standing of the patrilineage is being alienated, at least temporarily, through the use of impersonal cash, suggesting an attenuation of mutual obligations of patrilineal and matrilineal relations, reflected as well in the reification of houseplot boundaries. Several of these cash-transacted houseplots have been acquired by villagers living elsewhere, often in major urban centres such as Lagos or Akure, who build houses to fulfil expectations that they have an ancestral home for their retirement and also for use as a source of rental income. These houseplot sales take place between fellow villagers who are unrelated, the buyer negotiating with representatives of the family who own the

plot. The use of cash in these transactions implies an impersonality that would make it morally inappropriate in land agreements between family members. Some villagers have taken issue with this practice, notably village chiefs, who have decided to ban cash houseplot transactions, saying they discourage outsiders from building houses because of the additional expense thus inhibiting village expansion. It is also possible, however, that these chiefs believe that their roles in arbitrating land transactions will be undermined by cash. Despite this decision, it seems doubtful that well-sited houseplots acquired from non-family members will not include cash in future transactions. For example, I was told of a recent instance of a man offering a houseplot to another for cash; the latter was told that the cash part of the transaction should be hidden.

Thus while rural Ekiti villagers continue to build family houses and bear children to perpetuate the family name, upholding the moral ideal of patrilineal continuity, they are also constituting very different arrangements regarding family houses, village land tenure, and houseplot boundaries in practice which ultimately may contribute both to a diminution of the importance of the patrilineage in land acquisition and to fertility change.

Shifting boundaries of bodies and the demise of arranged marriage

If the house is the site of reproduction of the social group, the patrilineage, then women's bodies are the sites of reproduction of individual members of the patrilineage. While the lack of boundaries of houseplots in the past reflected the ideal of openness among sharing kin, the boundaries restricting entry of outsiders, particularly potential affines, into the house proper and their access to women of the house have, until recently, been closely guarded. The importance of these boundaries was accentuated both by the sometimes elaborate archways adorning the doorways of Ekiti Yoruba houses and by the songs and gifts that celebrated the virginity of new brides.⁸

In the past, a father's⁹ authority over members of his house-compound—his wives and their children, his sons and their children, etc.—was reinforced by an ideology of patrilineal descent and was represented in everyday ways by the power of the *baale* (father of the house) over the passage of people through a central front door (*oju ile*), both controlling and protecting inhabitants on 'the inside' from 'the outside'. Thus, a prospective suitor or his family soliciting an arranged marriage would be 'screened' by a young woman's father. The girl would act in certain prescribed ways as one older woman explained:

In the past if a girl is given to a man and the man comes to greet her in the house, the girl will be hidden. If the girl was seeing him off, she will turn her back to him.

Once arrangements had been made between this man and the prospective bride's father, annual payments of yams (*isu obutan*) and labour (*owe* or *ebese*) were given to the father. This process culminated in the payment of bridewealth, *idano*, which was timed to take place after the appearance of menarche. The veiled bride would then be taken from her father's house, outside, to

⁸ As Douglas (1973:98-99) has noted:

Interest in [the body's] apertures depends on the preoccupation with social exits and entrances, escape routes and invasions. If there were no concern to preserve social boundaries, I would not expect to find concern with bodily boundaries.

⁹ The Yoruba sense of the word father (*baba*) is classificatory; it refers to the oldest patrilineal male in the house but may also refer to all men of that generation, including junior brothers and male cousins.

her husband's house where her entry through the doorway was marked in various ritual ways.¹⁰ Later in the evening, she was uncovered both literally and figuratively by her husband, after which a bloodied white virginity cloth was publicly displayed. The cloth would then be taken to the bride's family house, marking the successful conclusion of her family's control of her sexuality. She was thereafter 'covered' by members of her husband's household who awaited her first child which was expected to arrive shortly.

The idea of the protected threshold-doorway of a house, referred to as the *oju ile*, literally 'eye of the house', is linguistically related to the vaginal threshold, the *oju ara*, 'eye of the body', with its covering, the *ibale* (hymen), protecting the passageway between the inside (*inu*, womb) and the outside (*aiye*, world). A house's front doorway represents the opening between inner domestic and outer public space, just as the vaginal opening distinguishes between inner and outer domains. The Yoruba phrase for womb, *ile omo* (house or room of the child), further reinforces this association between houses and female bodies (see Carsten and Hugh-Jones 1995), both of which may be perceived as structures which protect those within from outside dangers. Indeed, the *ibale*-hymen, a thick red film within the vagina, was described by one traditional healer as 'a sort of internal security system'. This representation of protection and vulnerability associated with covered thresholds and with the inside and outside of houses and bodies corresponded with the power of fathers to regulate the passage between these two spaces, reflecting prevailing relations of intergenerational authority.

However, the ability of fathers to exert such authority was undermined during the colonial period. With the introduction of a colonial court system and procedures for divorce (through repayment of bridewealth) in the late 1920s and other changes in the political economy such as cash-cropping, the system of arranged marriages was undermined (Lloyd 1968; Caldwell, Orubuloye and Caldwell 1991). The attendance of young girls in primary school in the late 1950s also contributed to new ways of establishing marital relations that had important consequences for intergenerational relations. Eventually what occurred during the late 1960s was a pattern whereby young women moved to their husbands' houses after developing sexual relations with the future husbands, often after becoming pregnant. In some cases, it came to be the pending child that cemented these relationships rather than bridewealth payment or other preliminary marital exchanges.

Table 2
Early sexual experience of rural Ekiti women, Ages 35-70+ (percentages, numbers in parentheses)

Age group	Arranged marriage		Virgin when married ^a		Ever divorced		Pregnant when married		Virginity increases fertility		Virginity causes disease	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
35-39 (n=4)	--	100	--	100	--	c	c	c	c	--	25	75
40-49	12	88	63	37	12	88	67	33	50	50	12	88

¹⁰ In Ekiti, a bride's feet were washed before entering and she was given a broken calabash to step on, the number of resulting pieces indicating the number of her future children (Oguntuyi 1979:19).

(n=8)	(1)	(7)	(5)	(3)	(1)	(7)	(2)	(1)	(4)	(4)	(1)	(7)
50-59	71	29	100	--	29	71	--	--	86	14	--	100
(n=7)	(5)	(2)	(7)	(2)	(5)	(6)	(1)	(7)				
60-69	85	15	100	--	31	69	--	--	77	23	--	100
(n=13)	(11)	(2)	(13)	(4)	(9)	(10)	(3)	(13)				
70+	67	33	100	--	33	67	--	--	100	--	--	100
(n=6)	(4)	(2)	(6)	(2)	(4)	(6)	(6)					
TOTAL	55	45	82	18	c	c	c	c	c	c	5	95
(n=38)	(21)	(17)	(31)	(7)	(9)	(27)	(3)	(2)	(28)	(8)	(2)	(36)

^a Virgin when moving to husband's house; if no, pregnant column indicates whether woman was pregnant before she moved. ^b In both cases, the disease mentioned was epilepsy (*warapa*). ^c Data missing.

As these relations of authority of fathers over marriage have changed during the colonial period, more informal and fluid formulations of conjugal relations have developed (Guyer 1994:231). For some, the choice of a spouse depended to some extent on ideals of love and sexual compatibility, thus potentially contributing the closer conjugal relations that may support fertility decline.

This change in elders' authority over arranged marriages was reflected in a reinterpretation of virginity in general, and of that bodily boundary, the hymen, in particular. In the past, all young women who moved to their husbands' houses were said to be virgins.¹¹ However the importance of virginity (*ibale*) rested as much on ideas about fertility (Boddy 1989:55) as on a woman's chastity being a point of pride for her husband and a bride's family (Olusanya 1969:15; Fadipe 1970:66; Caldwell et al. 1991). Many believed that if a woman met her husband a virgin, she would immediately become pregnant. Two related ideas supported this claim: women who were virgins had not 'spoiled' themselves (i.e., their fertility) through socially unsanctioned sexual liaisons; and immediate fecundity was related to social and moral behaviour. Thus young women had a certain interest in remaining virgins as they were not only socially rewarded for this behaviour by their families and by their husbands, but also because they believed that they would be biologically rewarded, by immediate pregnancy.

However, with the introduction of court divorce, the demise of arranged marriage, and attendance of young girls at school, virginity, instead of enhancing fertility through socially correct behaviour, came to be perceived as socially backward because it was associated with arranged marriage and as anti-social because attendance at social events and subsequent sexual forays were one way of finding a husband (see Guyer 1994:245). Like their educated male counterparts, young women who attended school were likely to disparage certain practices associated with a parochial past, preferring modern, 'enlightened' behaviour. Hiding in the house, away from the eyes let alone the arms of men, came to be considered 'anti-social' behaviour. Thus when young men pressed girlfriends and fiancées for premarital sexual relations, young women may have been inclined to concur not only for emotional reasons but in order to appear modern, rather than traditionally chaste.

¹¹ There were ways around this ideal such as the use of packets of chicken's blood inserted in the vagina.

This transformation of the relationship between virginity, correct social behaviour and fertility is reflected in the recent association of virginity with certain diseases identified with infertility (see Renne 1993b). Thus changes in marital arrangements have led to a reversal of the moral evaluation of virginity that is also couched in terms of health, from something good for women's fertility to something bad. This change in the perception of virginity and what would seem to be an anatomical given, the hymen, underscores Laqueur's (1990:236) point that readings of the body are grounded in a particular social and historical context and 'must be regarded as a narrative of culture in anatomical disguise'.

However, this shift in the moral assessment of the hymen has not gone uncontested. Some older women viewed young women's exposure to Western education and freedom of movement with some ambivalence as may be seen in one woman's comments:

Civilization has come and things have changed. Is it children who are 15 years old who have become pregnant and go to their husbands' houses without taking anything from him [i.e., bridewealth] who will be virgins? All this was caused by the school because they were exposed to immoral acts. And they will say they are going to school, they will just branch to their boyfriend's house which no one could do in the past.

Some Christian writers are also advising premarital chastity for reasons of bodily and spiritual purity, teachings that are having an effect on some younger village women who said they prefer to remain virgins until they are married. These debates over the moral assessment of virginity and marriage not only represent arguments over a new set of values relating to individual choice of spouses. They also reflect intergenerational contests over the grounds that legitimate such behaviour which also have implications for fertility change as when younger villagers attempt to circumvent parental pressures to have more children.

Shifting boundaries of child-fostering and ties of blood

Olusanya (1989:76) has referred to Yoruba elders as 'veritable props of prolific childbearing', in part because of their support for the ideal of large families. Elderly relatives may also have a practical interest in high fertility because they may want to foster a child for domestic help and companionship. Yet just as the edges of patrilineal obligation are being subtly altered through houseplot boundaries, and the diminished patriarchal authority in arranging daughters' marriages is reflected in the demise of virginity, so too the category of people deemed appropriate to raise children is being narrowed and redefined. But unlike the graphic boundary markers of survey posts and hymens, the boundaries of this change are not so obvious, reflected as they are in the perception of blood ties. Nonetheless, it appears that attitudes toward child-fostering are changing, which suggests a strengthening of parent-child bonds that may contribute to fertility decline.

In this Ekiti village, child-fostering, raising another's child as one's own (see Bledsoe and Isiugo-Abanihe 1989; Goody 1982), was quite common in the past. Of 115 foster-parents interviewed, 50 per cent had been fostered as children. Child-fostering was valued because it was believed that birth parents would not be sufficiently strict with their children to properly raise them, it furnished labour for elderly relatives, it provided a means for childrearing in cases of crisis, and it extended a child's kin connections, among other reasons.¹² It continues today

¹² See Goody (1982) for a summary of different types and rationales for child-fostering in West Africa.

Table 3
Reason for child being fostered

Reason	Female (n=78)					Male (n=49)				
	0-4	5-9	10-14 %	15-19	Total	0-4	5-9	10-14 %	15-19	Total
Birth parent:										
Schooling	12	18	--	--	7	25	19	--	--	12
Died	12	13	9	31	14	8	--	17	56	17
Divorced	26	26	6	23	16	8	13	25	--	12
Travelled	12	9	3	--	5	--	--	8	--	2
Many children	26	4	6	8	8	8	6	8	--	6
no money										
Total	88	70	24	62	50	49	38	58	56	49
Foster parent:										
Needs help, company	12	13	53	15	31	34	25	42	22	31
Barren	--	--	6	--	2	--	6	--	--	2
Total	12	12	59	15	33	34	31	42	22	33
Foster child:										
Schooling discipline	--	4	6	23	8	17	31	--	--	14
Requests	--	13	11	--	9	--	--	--	22	4
Total	--	17	17	23	17	17	31	--	22	18
TOTAL	100	100	100	100	100	100	100	100	100	100
n	8	23	34	13	78	12	16	12	9	49

as many young Ekiti village children are sent to live with kin both within and outside the village. From a village-wide household survey, I found that child-fostering was common, with 19.2 per cent of children in the village (in late 1991) raised by foster-parents.

This relationship establishes ties of mutual obligation as children work for their foster parents and in turn, receive education, and discipline, and are able to extend their network of potential supporters. Children are also fostered because of parents' need for child-care (in case of divorce or because the children are being educated) or because elderly parents ask to raise foster children, often grandchildren, for their help and companionship. These two types of fostering, crisis fostering and old-age assistance, are the most common types found in the village today (Table 3).

However, there is some indication that the frequency of child-fostering may be changing (Caldwell, Oruluboye and Caldwell 1992:227), with some younger villagers saying they will not have their own children fostered. Several younger women and men interviewed cited mistreatment and overwork as reasons why they preferred not to have their children fostered. Others cited the problems of leaving children in the hands of uneducated grandmothers who might not properly care for their charges (Renne 1993a). Further, the introduction of universal primary education and increasing cash-crop production have led to competition both for places in school and for farm labour. Some young people feel, on the basis of personal experience, that their own children's life chances will be jeopardized if they have to compete with the foster-parents' children.

If what constitutes being a good parent is being redefined by young parents, children are believed to have changing expectations as well. Foster-children may cause family problems with their accusations of maltreatment. Unlike children in the past who were fostered to maintain family connections and to strengthen their own or their parents' social network, foster-children are now perceived as possibly jeopardizing these ties. Paradoxically, in order to maintain the tradition of good family relations, it may be better for children to be raised by their biological parents as one man explained:

Because no matter whatever you spend on any other child they will not value it. From my own personal experience I have come to understand that even if I have to help any family I will decide that such a child will have to live at his or her parents'. If it is school fees you want me to take care of, I will send the money to the parents, let the child stay with them. Because...I've come to understand that bringing children of other people in your house, taking care of them, at last you will be blamed for it...

While this man's decision to send money rather than foster a child may not be common, the substitution of cash for kinship relations is becoming evident in other areas as in houseplot transactions discussed above. Despite the expectations of trust and the mutual support of extended family members, the realities of some villagers' experiences either as foster children or as foster parents has led them to the conclusion that fostering is not always beneficial. For some, like one secondary school girl who remarked 'A real parent will care better for the child', the 'real' (biological) parent is the best parent.

The meaning of blood and the morality of parenthood

This shift in the moral assessment of foster-parenthood may be related to changing notions about blood relations as well. For example, some people felt that foster-child mistreatment can be overcome by biological closeness, expressed in terms of blood by one 40-year old man:

If my child is with my mother, I will have no cause to fear, she will know that **her own blood** has the child and she will care for the child as she will care for me. But if a child is given out to another person outside one's immediate home or family, it may be dangerous.

Several people who saw positive advantages in child-fostering said that they would only have their children fostered by close blood relations. The conflation of emotional closeness with blood and the idea that it is best to have one's children fostered by blood relations was supported by foster-parents' remarks. The range of relationships of foster-parents to foster-children reflected this preference for close kinship relationships in the village. Fostering parents were most often grandparents, raising the children of their own sons and daughters. Only one child was fostered by a person who was not kin-related. This pattern was common in the past as well, at least in the rural Ekiti Yoruba area (see Renne 1993a).

What appears to be changing is that some people are taking these blood restrictions even further, stressing the importance of biological parents to the exclusion of all other blood relations. Several people maintained that no one could care for a child like the child's own parents. Exactly how people have developed these attitudes about child-rearing remains to be more specifically investigated. School reading material, the media, and church teachings have surely contributed to these changing attitudes generally (Caldwell 1977a:101-103). It is also possible that biology classes teaching human genetics and the inheritance of blood types, for example, have had some

influence on people's thinking. I did not ask specific questions about how blood relations are formed so I cannot say whether this is actually the case. However, answers to questions about the formation of children in a woman's body made it clear that there has been some reassessment of bodily processes influenced by Western education among educated young men and women. For example, several young men cited Western genetic explanations of procreation, mentioning X and Y chromosomes, as well as sperm and eggs. It is possible that these Western biological models of human relationships may be influencing young people's perceptions of kinship as much as primary school materials depicting the nuclear family (Caldwell 1977b:15) and instruction in English using kinship terms that stress these roles (Goody 1990:132).

Thus, unlike the past, when fostering was considered to be good—helping others who in turn help you, and disciplining children—it is now being reassessed by some as bad. Biological parents, because of their closely shared blood, say that they are able to strike the best balance in terms of discipline and affection in child-rearing. This reassessment may affect fertility as people who say they do not want to have their children fostered limit their numbers to ensure that they do not need to do so, as one man explained:

This is one of the reasons why I said I want just four children. I don't need to give any of them out. I should be able to finance their needs.

The decision not to have children fostered is held to be the morally correct one by some younger villagers even while their elders may make contrary claims.

Discussion

The changes of houseplot transactions, of parental authority over marriage, and of child-fostering suggest that the mutual obligations toward a wide group of patrilineal and matrilineal kin are being attenuated in favour of a more restricted group in rural Ekiti. The shifting boundaries of houseplots, virgin bodies, and blood ties concretely illustrate the ways that family land, marriage, and parenthood are being redefined. These changes evoke different shades of moral meanings which help to justify new types of behaviour such as offering family land to non-kin for cash, practising premarital sexual activity, and refusing to have children fostered, thus setting the stage for fertility decline. However if this opting out of the system of mutual obligations is taking place, there are countervailing tendencies, political, cultural, and economic, which are undermining this process in contemporary Nigeria.

In the case of a shift toward cash-based houseplot transfers in rural Ekiti, federal government policy, in particular the Nigerian Land Use Act instituted in 1978 to regularize land transactions, discourages cash-based transactions ('sale') of rural land (Francis 1984:9). Further, while local government officials can issue documents certifying rights of occupancy on family land plots, the procedure involves long hours, heavy expenses, and considerable uncertainty (Myers 1990).

It should not be surprising, then, that Ekiti villagers have chosen to ignore this Act altogether (Renne 1995). Land transactions involving cash are not documented nor are they reported to local government officials for certification. Rather than relying on the contradictory practices set forth in the Land Use Act, people view their security in rural land ownership as resting on local assertions of customary tenure, preferably supported by well-educated children who will have the political and economic clout to look after land claims. This behaviour is also reinforced by a continuing sense that communal ownership of land is morally preferable to cash-based, individual

ownership. However, one need not be a nostalgic traditionalist to see how present-day uncertainty regarding rural land transfer supports this ideology, even while it is being undermined in practice.

In the case of the decline of virginity and parental authority over the marriage, it is not necessarily the case that this weakening of parental interference and privileging of modern ideals of romantic love in the choice of a spouse will lead to closer conjugal relations among couples and more nucleated families. Under the present economic and political situation in Nigeria, Ekiti village women may use their sexual freedom to broaden their ties to several men and their kinship networks through children in an attempt to enhance their economic security (Guyer 1994:250). This practice is referred to as 'polyandrous motherhood', stressing lateral ties of obligation created through children rather than lineal ties created through marriage; it remains unclear how widespread the practice is and whether this strategy will ultimately work for women (Guyer 1994:223). In the short term, however, it supports high fertility.

Finally, changing ideas about foster-parenthood also relate to the present economic situation in Nigeria. For example, the devaluation of the naira in 1987 has led to price increases in imported goods, food, and education, making it more expensive to raise one's own children, let alone another's. The combination of not wanting to have one's own children fostered and economic constraints on fostering seems to have an effect on the practice of child-fostering. Yet child-fostering still has considerable cogency in the Ekiti area, partly as a moral ideal and partly because electricity, pipe-borne water, and telephone services are not being provided, even when the infrastructure for such services is in place. On a visit to the village in December 1994, I was told that there had been no electricity in three months and no piped water in six. Children, fostered or otherwise, are still needed as substitutes for these services, carrying water or firewood. Indeed, many of the people who say they will not have their own child fostered because fostering is 'bad' still say they would foster another person's child. Child-fostering, then, serves as a strategy for coping with the economic difficulties of living in contemporary Nigeria even while it is being recast as an ethically ambiguous practice.

This economic and political uncertainty,¹³ manifested in political crises, currency devaluation, university closings, teachers' strikes, and petrol shortages, undermines the process whereby mutual obligations are restricted to an ever-narrowing group of kin. Unlike the oil-boom days of the 1970s when Caldwell (1977b:25) could write that

many forms of insecurity have been reduced by a host of changes stretching from modern health measures to a smaller chance of being destroyed by local disasters because of better communications, greater commercialization and a strong central government...

government support for basic infrastructure (Adepoju 1993) and health care has been declining (Popoola 1993) in recent years. Under such circumstances one needs to extend one's network of kin, not restrict it (Goody 1990:140). Indeed, Robertson (1991:39) argues that fertility decline is related to the availability of wider social and state institutional support for some of the costs of reproduction. Urban residents for whom some services such as electricity are still being maintained may be affected by the economic problem of maintaining social networks with declining income, and hence may limit fertility to some extent. However, rural villagers,

¹³ See Parkin (1978:139-140) who associated high fertility among the Luo people of Kenya with uncertainty both at the domestic and national political levels.

particularly where these services are not available and where their livelihood largely derives from agriculture, may see it in their interest to maintain extended family ties and obligations, as well as high fertility, even while processes are in place which weaken these ties.

Just how the present economic and political crisis will affect future fertility change in Ekiti is unclear. While younger village women and men said they wanted fewer children in 1992 (Renne 1993c) so that they could raise the number of children they could socially and economically 'cater for', it seems unlikely that reductions in fertility below four children per woman will occur in rural Ekiti at present. Rather, the effects of the processes of shifting boundaries of houseplots, bodies, and blood ties are more likely to be reflected in the behaviour of those who have left the village for the urban centres of Ado-Ekiti, Akure, and Lagos. Those building houses on cash-transacted land and putting up concrete walls often live away from the village, may or may not be married to a fellow villager, and are not likely to have their own children fostered by village grandmothers except in cases of crisis. Whether these people who are to a certain extent 'opting out of the system of mutual obligations' are having fewer children is a question that remains to be investigated. Nonetheless, for those remaining in the village, the deterioration of government services and need to rely on kin are a cautionary reminder that despite shifts which suggest social reorganization and cultural reinterpretation that may contribute to fertility decline, these local processes are also situated in larger political and economic contexts with which they interact.

Conclusion

The ideal of a strong patrilineage with a large family house peopled by many descendants, with fertile daughters whose marriages cement relations with other such lineages, and with the wherewithal and moral acumen to foster less fortunate children, represents what Bourdieu (1977:34) refers to as 'official kinship', an ideology that presents prevailing relations of kinship authority as the way that kinship is supposed to be. This essay has illustrated some of the 'practical strategies' (Bourdieu 1977:35) that some Ekiti villagers have employed to take advantage of new social, economic, and political opportunities and to make cultural sense of these changes. Thus certain practices associated with family houses, with women's bodies, and with blood ties reflect shifts in the boundaries of kin relations even while the ideals associated with a certain form of social organization, the patrilineage, persist. That these changes are taking place, suggesting an attenuation in the circle of kin for whom mutual obligations endure, does not diminish the power of these ideals which remain a source of moral inspiration even as they are sometimes used to justify more mundane personal ends. I have attempted to show how reinterpretations of the meaning of houseplots, virginity, and foster-parenthood reflect continuing contests over the representation of kinship ideals and the oscillation between the need to pursue personal interest and to present moral justification.

This paper also argues for an analysis of the construction and reinterpretation of symbolic meanings associated with particular practices and things into its approach to the study of fertility. A processual approach has the advantage of considering culture as somewhat more grounded in the specifics of what people do with and say about everyday things and practices associated with fertility. Further, it is not altogether unfamiliar to demographers who use things such as TV sets and earthen floors as symbols of wealth in survey questionnaires. These things are not unimportant (Elias 1978:117) for it is through such ordinary behaviour as the use of Sunlight Soap (Burke in press) or the gossip about using condoms (Watkins and Danzi 1992) or the lessons on genetics in secondary school classes (Delaney 1987) that individuals' strategies which undermine

prescribed institutional ideals can take place. If there is to be theory of fertility transition which accounts for shifts in what is considered 'within the calculus of conscious choice' (Coale 1973), it must be based on 'a careful description of the *underlying assumptions*' (Schutz 1970:56) about fertility. These assumptions may be examined as they are reflected in the local meanings associated with religious rituals and beliefs (Caldwell and Caldwell 1987) as well as in more mundane things and practices. It would then be possible to see how meanings attributed to these things and associated ideas about fertility appear to be changing.

If I have emphasized that a detailed ethnographic study of the construction and reinterpretation of meanings considered over time can illuminate fertility change, I do not mean to imply that specific studies of the economic and political aspects of fertility change should not be undertaken. Rather, the difficulty of encompassing these different perspectives within a single study suggests that collaborative research is necessary if such a multidisciplinary approach is to be successful. This paper has attempted to place the analysis of meaning and symbolic representation through the ethnographic study of everyday practices within the realm of possible anthropological approaches to fertility change and to outline the benefits of this perspective for demographic inquiry more generally.

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The quantity/quality of children hypothesis in developing countries: testing by considering some demographic experiences in China, India and Africa*



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Abstract

Initially a general regression equation is estimated, making use of cross-country data, relating the level of the total fertility rate to a range of variables, including the level of per capita real income. There is a statistically significant negative relationship between the level of the total fertility rate and real income per capita. Once the theory of the quantity-cum-quality of children hypothesis is set out formally, and in a flexible form, it is clear that this statistical relationship is not inconsistent with this theory. However, this relationship is not a strong, or convincing, test of this hypothesis. To provide more satisfactory tests of this hypothesis, additional relevant information from various developing countries is used. Information on recent demographic changes in China provides a comparatively powerful, direct test of the theory. More indirect tests of the theory are provided by drawing on data for India in the 1960s, and for sub-Saharan African countries in the 1980s and early 1990s. These various tests suggest that the quantity-cum-quality hypothesis, in its flexible form, appears to explain some of the changes in fertility rates observed in various developing countries in recent decades.

The quality-cum-quantity of children hypothesis states that as the real income that a couple receives increases they invest more resources into increasing the quality of the children they have acquired instead of allocating these resources to acquiring more children. This assumption has been called upon to explain, in part, a constant relationship that has been observed during the demographic transition experienced by many communities; namely, that the level of the total fertility rate (TFR) for a community tends to fall as the level of mean real income for this community rises. This relationship tends to be confirmed by recent cross-country data on the total fertility rate and mean real incomes measured at international prices. As is shown in the next section, based on these cross-country data and after allowing for a range of other relevant considerations, there is a statistically significant negative relationship between the total fertility rate and appropriate measures of mean real incomes. The existence of this relationship is not, however, direct confirmation of the quality-cum-quantity of children hypothesis. What is more, there are alternative statistical results to be found in the relevant literature which imply that the quality-cum-quantity of children hypothesis may not explain any of the variation to the TFR across communities.

In the attempt to resolve this matter attention first turns to considering some appropriate theory of household behaviour. When this theory is set out in a comparatively general and flexible form, to allow for a range of considerations, it becomes clear that the observed statistical relationship mentioned in the previous paragraph could be explained by either the quality-cum-quantity of

* An anonymous referee is thanked for providing helpful comments on a previous draft of this paper. Excellent research assistance was provided by Nigel Rajaratnam.

children hypothesis; or the assumption that the various costs to mothers when acquiring children—in the form of income forgone in bearing and caring for children—increase as the level of real income in the community rises; or by a combination of these theories.

A search needs to be made for additional empirical evidence which provides a much more direct test of the quality-cum-quantity of children hypothesis. Above all, information needs to be found which records the reasons why couples, in developing countries in particular, decide to acquire, or not to acquire, additional children. Fortunately, just such information has become available as a result of the careful surveying (carried out over the 1980s and early 1990s) of the inhabitants of three villages in central China in which comparatively rapid economic change also took place. This survey information is discussed below; it tends to support the view that, if certain circumstances apply, then the quality-cum-quantity of children hypothesis is satisfied. To provide a further test of this hypothesis some relevant information from India for the 1960s is also briefly considered. This information is not completely satisfactory, however, since it only allows certain relevant behaviour to be inferred from certain broad empirical facts; it does not provide direct recorded observations of relevant behaviour.

The statement of the relevant theory of fertility also indicates that under quite reasonable sets of circumstances the quality-cum-quantity of children hypothesis, and the opportunity-cost-for-mothers assumption, may be comparatively weak factors in explaining variations in the TFR. In these circumstances there is likely to be a positive, not a negative, relationship between the level of the total fertility rate and the level of mean real income in a community. This insight suggests an alternative test of the general theory developed in the third section: a test which takes the form of first finding those situations where most households in the community are likely to invest comparatively few resources in the quality of their children. It remains to determine if there is a positive statistical relationship between the total fertility rate and mean real income within a community, or across communities. If this is so then this provides an additional partial test of the quality-cum-quantity of children hypothesis. This approach to the testing of this theory is performed by reference to data covering the late 1980s and early 1990s for a range of sub-Saharan countries.

A number of general implications follow from the various arguments developed here. These implications are mentioned as part of the concluding comments.

Some aggregate empirical evidence on the demand for the number of children

In Figure 1 the total fertility rate (TFR) in 1992 for 95 developing countries is plotted against the respective 1992 measures of gross national product per capita (measured in United States dollars at 1992 international prices). The gross national product per capita for country i is denoted

by (GNP_i/n_i) .¹ The fitted ordinary least squares regression based on this information is the following:

$$\text{TFR}_i = 7.25 - 1.424 \log(\text{GNP}_i/n_i), \text{ adjusted } R^2 = 0.485, \quad (1)$$

(17.582) (-8.739)

where the figures in brackets denote the t-statistics. Both coefficients in this regression equation are statistically different from zero (at the one per cent level of significance).

On consulting Figure 1, however, it is reasonably obvious that other factors are at work explaining differences in TFRs across countries. One such factor appears to be cultural differences across nations. To test for this possibility a dummy variable, denoted by D_1 , is used to distinguish those countries in North Africa, the Middle East and South Asia (but not Bangladesh and countries in South-East Asia) in

¹ The data are taken from World Bank (1994:212-213, 220-221).

which devotion to Islam is the dominant religious faith. Another dummy variable, denoted by D_2 , is employed to distinguish those countries in sub-Saharan Africa.

Besides this cultural consideration, intuition suggests that one other factor which may assist in explaining the variation in the TFR across countries in 1992 is the level of well-being, not just the measure of mean income, to be found in the communities concerned.² A measure which may be thought to come near to what is required to measure community well-being is the Human Development Index for 1990 (See UN 1990). While this index is certainly not ideal, and has been severely criticized for inaccurately measuring the level of community well-being (e.g. Das Gupta 1993), this variable may be accurate enough for the present purposes. Above all, the Index does incorporate measures of life expectancy at birth, literacy rates and, to some degree, the level of income poverty to be found within communities, all variables which could be considered for inclusion in a measure of community well-being.

Another variable that also may be considered relevant within the present context is the level of family planning effort. Here use is made of the Mauldin and Ross (1991) index for family planning effort for various countries for 1989 (see also Ross and Mauldin 1994).

Since cross-section data are being used to estimate the relevant regression equation, heteroskedasticity may be present in the estimation.³ To avoid this difficulty use is made of the White (1980) method in the estimation of the following regression equation:

$$\begin{aligned} \text{TFR}_i = & 9.557 - 0.709 \log(\text{GNP}_i/n_i) + 0.888 D_{i1} + 0.535 D_{i2} \\ & (10.951) \quad (-3.890) \quad (2.527) \quad (2.362) \\ & -0.623 \log \text{HDI}_i \quad -1.113 \log \text{FPE}_i, \quad (2) \\ & (-2.729) \quad (-6.331) \\ & \text{adjusted } R^2 = 0.77, \quad n = 68, \end{aligned}$$

where the figures in brackets denote the t-statistics.

All the estimated coefficients in equation 2 have the expected sign and are statistically different from zero at the 2 per cent, or less, level of significance. Certainly the statistical results reported in equation 2 are as satisfactory as those to be found in a number of comparable studies which also attempt to explain variations in the level of the TFR, or changes in the level of the TFR, across countries: studies such as those by Bongaarts (1992), Schultz (1994), Heerink (1994:135-136, 345-346), Barro and Sala-i-Martin (1995:453-455), and Subbarao and Raney (1995). The variables used in these alternative studies are rather different, however, from those referred to in equation 2. This observation implies, therefore, that modifications of what appear to be a reasonable specification of

² In Martina (1995) is a discussion of the theory underpinning this intuition—a discussion based on the theory of uncertainty.

³ This possibility means that the estimates of the standard errors may be biased. See, for example, Greene (1993).

Figure 1
1992 total fertility rate against 1992 GNP per capita at international dollar prices

the regression model may have the consequence of producing quite different empirical results (cf. Ahlburg and Diamond 1993:180).

To emphasize this point further, attention concentrates on the variable of most interest here; namely, gross national product per capita, or just mean income. The coefficient for the logarithm for this variable set out in equation 2 has a negative sign and is strongly statistically significant from zero. Yet in the study by Subbarao and Raney (1995), for example, where emphasis is placed on the provision of female education, the coefficient for mean income takes a comparatively small negative value and is not different from zero at the standard levels of statistical significance. In contrast, the positive coefficient for female enrolments in secondary school is statistically different from zero at comparatively high levels of significance.⁴

In recognition of the possibility that the level of female and male education may be of importance in explaining variations in TFRs across countries, a number of measures of these variables were used in an extended version of equation 2. The coefficient estimates for these variables (which are not shown here) were not different from zero at reasonable levels of significance. All the other variables referred to in equation 2 remained statistically significantly different from zero, however. (It should also be pointed out that a measure of literacy rates is included as part of the measure of the HDI; thus a measure of female education levels has been allowed for in equation 2)

These conflicting results suggest, therefore, that there is a range of difficulties associated with attempting to explain variations in the TFR across countries. Without going into detail, one such difficulty is that the regression estimates referred to in equation 2 almost certainly suffer from simultaneous equation bias since a number of the variables on the right-hand side of that equation almost certainly are endogenous, not exogenous as implicitly assumed in that equation.⁵ Similar remarks also may be made concerning the comparable studies referred to earlier. But probably the more serious problem is that of multicollinearity which results from various relevant variables, or sets of variables, being highly correlated (cf. Johnson 1994:506-507). As a consequence it is difficult, if not impossible, to distinguish the separate influences, for example, of the level of mean income, and the level of female education on the level of the TFR. When the regression equation is specified in one form, then only one of these variables is statistically significantly different from zero. On re-specifying the regression equation to take a different, but reasonable, form, then only the other variable is of significance.

Bearing this last point in mind, the results set out in equation 2 suggest, tentatively, that an increase in the level of mean income in a developing country will assist in reducing the level of the TFR in this country. This qualified finding is consistent with the view that as the level of mean real income in this country rises so couples shift their preferences away from desiring more children and towards increasing the quality of the children already part of the household. But this inference is not the only one that could be drawn. As the discussion in the previous two paragraphs suggests, if the level of female education is highly correlated with the level of mean income, then changes in the level of fertility alternatively could be explained by changes in the level of female education which, in turn, implies changes in the opportunity cost of time for mothers bearing and caring for children. This increase in the level of this opportunity cost induces couples to reduce the level of the size of the family they want.

To gain some guidance on how to determine the importance of these two variables in influencing the level of the TFR, attention turns to considering relevant aspects of the theory of household

⁴ Barro and Sala-i-Martin (1995) also found that female, and male, years of primary and secondary schooling were statistically significant variables in explaining the level of the TFR across countries.

⁵ For example, while the level of mean income is likely to influence the level of the TFR, the direction of causation may also go in the reverse direction to some degree: the level of the TFR influences the level of mean income. To handle the associated simultaneous equation bias problem use could be made of instrumental variables (see, for example, Greene 1993). The difficulty is that of finding a suitable instrument variable.

behaviour, specifically, that part of household behaviour which bears on the factors that motivate couples to control the size of their families.

Non-linear budget constraints and the demand for children

The theory developed here does not profess to be complete. In particular, the important issue of how the presence of uninsurable uncertainty may influence a couple's decisions concerning desired family size is discussed elsewhere (Martina 1995).

The fundamental assumption imposed in developing the relevant theory of family behaviour in this section is that the objective that governs the representative couple, in altering their decisions concerning family size, is that of maximizing their level of well-being.⁶ The measure of well-being that a representative couple is assumed to adopt reflects, to some degree, altruism, since the couple is concerned with the quality, q , of the children they acquire. Parents expect the resources expended on maintaining and improving the health and education of a child to allow this child to lead a more fruitful life. These expenditures may not be made for purely selfless reasons: this child may subsequently earn a higher income (compared to the situation where these expenditures were not made) from which the parents hope to benefit; but the act of making these expenditures implies that the parents have choices to make. They have to choose between investing a given endowment on increasing the number of children in the household, or investing this endowment in activities that are required to develop the quality of the children already part of the family, or just expending this endowment on other goods and services. These expenditure choices imply that the couple is faced with a non-linear budget constraint. This fact raises certain complications since expenditures on the quantity and quality of children may interact in complex ways. To demonstrate this general idea more formally some relevant theory is developed here which draws on Becker (1991), as well as Becker and Lewis (1973), Rosenzweig (1990) and Razin and Sadka (1995:Ch. 3). The way this theory is developed is rather different, however, from that to be found in these various sources.

It is assumed that the model takes the following basic form:

$$\text{maximize } u(n, q, z) \text{ subject to (s. t.) } p_c qn + p_z z = Y, \quad (3)$$

where $u(\cdot)$ denotes the direct utility, or well-being, function for the representative household, n denotes the number of children, q denotes the quality of these children, p_c denotes the cost, or price, associated with acquiring an extra child, z denotes the amount of some composite good and p_z the price of this good. The term Y denotes the income available to be expended on these goods. No savings take place. The direct utility function is assumed to possess a range of standard properties such as being continuously increasing, and differentiable, in all arguments and quasi-concave. At a later stage additional concepts, or complicating factors, are touched upon, briefly, within the context of the optimizing problem set out in equation 3.

As it stands equation 3 is not in a form which is amenable to easy manipulation. To facilitate matters it is assumed that the optimization problem has been solved⁷ and the budget constraint is linearized around the optimization consumption points. Specifically:⁸

⁶ This is not to say that all couples are always capable of maximizing their level of well-being in the process of acquiring children; some certainly make mistakes. Nevertheless, even for the couples who make mistakes the attempt to maximize their level of well-being may still be the basic principle governing their behaviour at the margin.

⁷ In the optimization problem set out in equation 3 it needs to be assumed that, in the quality-quantity of children space, the non-linear budget line is less convex from below than that for the indifference curve for the utility

$$v(\pi_n, \pi_q, p_z, R) = \max \{ u(n, q, z) \text{ s. t. } \pi_n n^* + \pi_q q^* + p_z z^* = R \}. \quad (4)$$

where the locally optimum consumption points are n^* , q^* and z^* respectively. The linearized budget constraint is constructed by taking the non-linear budget constraint for Y , and rewriting it as follows: $R = Y + p_c qn$, where R denotes the locally linearized budget level. The indirect utility function in equation 4 is assumed to possess a range of standard properties such as being continuously differentiable in all arguments and so on. The indirect utility function set out in equation 4 can now be exploited to determine the form of the uncompensated, or Marshallian, demand function for the number of children; namely,⁹

$$n = f_n(\pi_n, \pi_q, p_z, R). \quad (5)$$

It is from this point on that the further manipulation of equation 5 allows a deeper understanding of the empirical information presented in the previous section. In that discussion the level of mean income varied across countries. To represent that fact here the demand function for n , set out in equation 5, is differentiated totally with respect to the non-linear income level. Remembering that $R := Y + p_c qn = Y + \pi_n n$, it is shown in appendix A that:¹⁰

$$\frac{dn}{dY} = \left[s_{nn} \frac{-n}{-Y} + s_{nq} \frac{-q}{-Y} \right] + \frac{-f_n}{-R} \quad (6)$$

In this equation the term s_{nn} denotes the compensated change in the level of demand for n as a result of a change in the shadow price for n , and the term s_{nq} denotes the compensated change in the level of demand for n as a result of a change in the shadow price for q .¹¹

Before discussing the properties of this last equation it is useful to decompose the changes in the shadow prices, π_n ($:= p_c q$) and π_q ($:= p_c n$), where it is noted that p_c may also vary in size as Y changes in size. Thus equation 6 can be rewritten as follows:

function it supports. This assumption is required to ensure that the equilibrium point is unique and stable. See Becker (1991:147) on this point.

⁸ For a discussion of linearizing, locally, non-linear budget constraints see Blomquist (1989).

⁹ To establish the statement in equation 5 it is noted that the optimization problem set out in equation 4 implies the following: $-\partial v(\pi_n, \pi_q, p_z, R) / \partial \pi_n = n$. This statement implies that Roy's identity is being applied. See, for example, Deaton and Muellbauer (1980) for a discussion of this theory.

¹⁰ The derivation of equation 6 in an appendix obtainable from the author draws on certain ideas to be found in Blomquist (1989).

¹¹ In these compensated demand functions the level of income is varied in order to maintain the initial level of well-being when prices change.

$$\frac{dn}{dY} = p_c \left\{ s_{nn} \frac{q}{Y} + s_{nq} \frac{n}{Y} \right\} + [q s_{nn} + n s_{nq}] \frac{-p_c}{Y} + \frac{f_n}{R} \quad (7)$$

This result represents, formally, the main set of ideas considered throughout this discussion.

Equation 7 indicates that a change in the level of real income for the representative household influences the demand for the number of children along three channels. Starting on the far right-hand side of equation 7, the term, $(\partial f_n / \partial R)$, denotes the standard income effect. Assuming that children are a normal good then a rise in the level of income (in the locally-linearized budget constraint) will result in a rise in the number of children desired, or demanded.

Turning to the set of terms in the middle of equation 7, the term, $(\partial p_c / \partial Y)$, reflects the change in the immediate costs of acquiring children as the real income varies for the representative household. This particular term will take a positive value if, for instance, at least some of any extra household income is generated by the mother in the household working for a wage in the labour market and, thereby, receiving additional income. In this instance a positive value for $(\partial p_c / \partial Y)$ would reflect the increasing opportunity cost of acquiring children as the income received by the mother in the family increases.¹² In empirical work relating to this matter the usual procedure, however, is simply to represent these opportunity costs with the proxy variable: some suitable measures of the education level attained by females in the community concerned (e.g. Barro and Sala-i-Martin 1995:452-453; Schultz and Zeng 1995; Subbarao and Raney 1995).

As for the set of terms in square brackets in equation 7, under a reasonable set of assumptions¹³ it can be shown that these terms must sum to a negative value. Thus the product of the two sets of terms in the middle of equation 7 must take a negative value if $(\partial p_c / \partial Y) > 0$. This result represents the argument that the number of children demanded by the representative household must decline if the opportunity cost of acquiring children rises as the income for the household rises. This result is to be expected and is not inconsistent with some of the empirical results referred to in the previous section.

The third set of terms set out in curled brackets in equation 7 represents the consequence of the representative household being faced with a non-linear budget constraint. The presence of this

¹² The argument sketched out in the main text could be extended to include the point, made by Easterlin (1980) and Butz and Ward (1978), that a rise in aggregate real incomes implies that a wider range of goods has been created upon which households may expend their income. Thus to expend extra income on acquiring an extra child is to forgo the opportunity to consume this growing range of goods available.

In addition the term p_c in equation 7 in the main text could be extended by taking into account a range of relevant considerations. For instance, allowance could be made for: (i) the time, denoted by $L_c(Y)$, devoted to bearing and caring for children; (ii) the market wage, denoted by w_f , paid the mother in the household, and (iii) the costs of medical services, denoted by $p_{mc}(Y)$, associated with bearing and raising children. Now the term p_c is stated in the functional form: $p_c = \phi(w_f(Y), L_c(Y), p_{mc}(Y))$. Totally differentiating this function with respect to Y , the result could now be substituted back into equation 7 in the main text to give an expanded version of that equation.

¹³ These assumptions are that the compensated demand function for the number of children is homogenous of degree zero in all prices, and that n (the number of children) is a pure substitute for z (the composite good). The homogeneity assumption is a basic one in the theory of demand; see, for example, Deaton and Muellbauer (1980). The assumption that n and z are pure (compensated) substitutes implies that, at a fixed level of household well-being, as the price of z rises the demand for n also rises. This would seem to be a perfectly reasonable assumption to impose.

constraint implies that the two sets of terms in curled brackets will interact with one another. As an example to illustrate this process, suppose that, in the initial situation, there is an increase in household income generated by the introduction of new technology and new market opportunities. To take more advantage of these new economic opportunities in the future the representative household recognizes the need to invest more in the quality of the children. Thus the term, $(\partial q/\partial Y)$, takes a positive value.¹⁴ This action also implies that the value of the relative shadow price ratio, π_n/π_q must also rise (remembering that $\pi_n := p_c q$, and $\pi_q := p_c n$). The increase in this price ratio, in turn, will induce this household to demand, or desire, fewer children, other things remaining the same. Thus the term, $(\partial n/\partial Y)$, will take a negative value. This change will induce yet a further rise in the price ratio, π_n/π_q , which, in turn, may induce yet further investments in the quality of children. If these investments do take place, and the price ratio, π_n/π_q , changes accordingly, then the interaction process will continue. The point where it will stop is that where the representative household sees no further advantage to be gained by investing more in the children in the household.

Next it is noted that the term, s_{nn} , must take a negative value¹⁵ and the term, s_{nq} , is assumed to take a positive value. When these conditions are combined with the previous assumptions that the term, $(\partial q/\partial Y)$, takes a positive value and that the term, $(\partial n/\partial Y)$, must take a negative value, then the sum of the terms in curled brackets in equation 7 must take a negative value.

This illustration of the interaction effect suggests a number of implications. The first is that the type, or form, of the growth of household real income will influence the size of the interaction effects. If this growth is of a form which causes couples to see no advantage in investing more in the quality of children – say this growth is the result of improved weather conditions over a sustained period of time – then the sum of the terms in curled brackets in equation 7 will tend towards taking a value of zero. (The same point could be made with respect to the middle set of terms in equation 7, the opportunity cost terms.) If, on the other hand, the form of economic growth is quite different, and induces households to invest in the quality of children, then it is possible that relatively large interacting changes may be induced by the initial stimulus. Following this last point, it would not be legitimate to assume that the initial stimulus caused the complete, interacting, change. Rather the complete change is the result of a process of interacting variables.¹⁶

¹⁴ Again, at this point in the discussion, a more detailed argument could be provided by considering the benefits and costs associated with investing in the quality of children. To represent this idea it is assumed that $q = \varphi(p_s(Y), r(Y))$, where p_s denotes all the costs (including any opportunity cost of the time spent on formal schooling) associated with providing more schooling to a child in the household, and r denotes the rate of return on any investment in the quality of a child. If the way in which the growth in household income takes place indicates that the return on investing in the quality of a child is likely to be greater than the cost of this investment, then the term $(\partial q/\partial Y)$ in equation 7 in the main text will tend to take a positive value. If this is not the case, then this term will tend to take a value of zero. Again these ideas could be explicitly represented in an expanded version of equation 7.

¹⁵ This assertion is an implication of the assumed quasi-concavity of the direct utility function.

¹⁶ This last point has implications for determining the influence of a family planning program. Suppose an increased family planning effort (E) induces couples to reduce the level of demand for the number of children. This initial change, denoted by $(\partial n/\partial E) < 0$, will alter the shadow price ratio in such a way that couples now see advantage to be gained by investing more in the quality of children. This change in behaviour, denoted by $(\partial q/\partial E) > 0$, may induce yet further falls in the demand for the number of children, and so on as these two terms interact. It would not seem legitimate, however, to assign the whole of the fall in the demand for n , denoted by $\Delta n < 0$, to the

To draw together this discussion of the three sets of terms to be found in equation 7, it is noted that the sign of that equation is not immediately obvious, even if quite detailed information is available. For instance, if the community concerned experiences a growth in real mean income which creates new employment opportunities for women and requires the application of more skilled labour, then the first two sets of terms on the right hand side of equation 7 will take negative values. The third term in that equation will take a positive sign value if the number of children is a normal good. Another way of explaining this indefinite outcome is to note that the growth in real mean income in the community influences, simultaneously, both the demand and the supply side of the market for the number of children. While the increase in the level of real income in the community increases the level of demand for the number of children, this change may also be accompanied by changes, such as the introduction of new technology and the creation of more jobs for women, which also raise the supply price (the marginal cost) of acquiring an additional child. The equilibrium outcome of these offsetting changes is not immediately obvious.

To explain matters a little further, this idea is represented in the partial equilibrium diagram set out in Figure 2 which represents the market for the number of children. The demand function, $f_n(\pi_n, \pi_q, p_z, R)$, for the number of children is drawn in the space where the number of children, n , is set against shadow price for number of children, π_n ($:= p_c q$). The marginal cost, or supply, curve for the number of children is represented by the level of the shadow price for the number of children, π_n , at each level of the number of children. This supply curve for the number of children in Figure 2 reflects the assumptions that: (a) the marginal cost of an extra child, denoted by p_c , remains constant, and (b) the quality of any child is assumed to be constant, as the number of children increases. Relaxing these assumptions does not alter the general result to be derived here.

The initial number of children demanded, or desired, is that where the demand schedule at the locally linearized income level, R , intersects the marginal cost, or supply, schedule at this income level. This equilibrium number of children demanded is represented by the distance On_0 in Figure 2. Next there is an exogenous increase in the level of income. The demand function for the number of children shifts out to $f_n(\pi_n, \pi_q, p_z, R')$. This results, initially, in the equilibrium level of demand for the quantity of children rising from On_0 to On_2 .

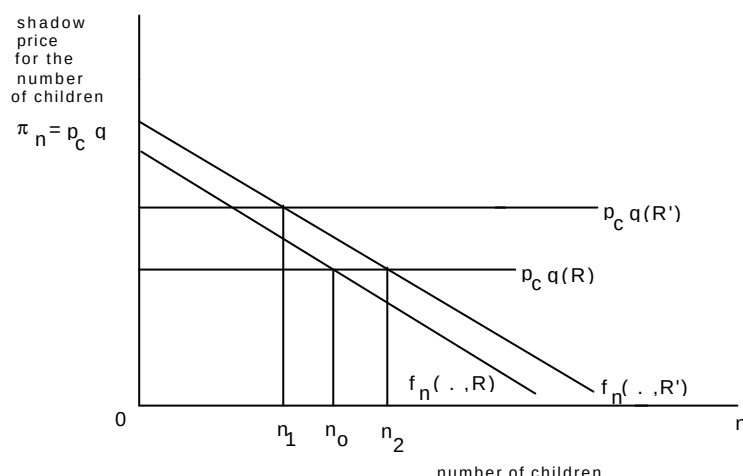
If there also is a rise, however, in (a) the demand for the quality of children and (b) the opportunity cost of acquiring an extra child, then the shadow price, or marginal cost, for the number of children must also rise. This implies that the supply schedule for the number of children must also shift upwards to, say, the level represented by schedule marked $p_c q(R')$ in Figure 2. This new supply schedule is taken to represent the end, or long-term, consequence of the interaction between the quality and quantity of children effects. As represented in Figure 2, the resulting rise in the costs associated with acquiring and maintaining children is large enough to ensure that the equilibrium number of children demanded at the end of the adjustment period (represented by the distance On_1) is less than the number initially demanded (represented by the distance On_0). Naturally, matters need not have turned out like this. The supply schedule may have risen by a much smaller degree, relative to the right-ward shift of

increased family planning effort. This point has been emphasized by Becker (1991:151) when commenting on observed changes in the TFR:

Although family planning might take credit for the whole decline in births because it is the initiating force, the induced increase in the demand for higher-quality children and the induced decrease in the demand for quantity of children are responsible for more than half of the decline of births.

the demand schedule, so that the equilibrium number of children demanded remained unaltered, or actually rose.

Figure 2



This simple example implies that it may be difficult to determine, from *a priori* reasoning alone, the relative position of the final equilibrium level of the demand for the number of children resulting from an increase in the level of mean real income in a community. Nevertheless, there may be circumstances where, based on additional information, it may be reasonable to deduce that the equilibrium level of demand for the number of children will fall as a consequence of a rise in the level of real income per capita in the community concerned. For instance, this rise in mean real income may be the consequence of (and future rises in real income can only be sustained if there are) much increased levels of investments in human beings, and especially investments in the education of children.¹⁷ That being the case, then parents are likely to begin to alter their preferences away from acquiring more children and towards increasing the quality of the children they have already acquired.

In contrast, however, consider the situation where the growth of mean real income is the consequence solely of the expansion of the natural resource base (say new and major deposits of a precious mineral have been found), or an improvement in the terms of trade facing households in rural communities in developing countries. In this situation there is likely to be only an increase in the demand for the quantity of children; the demand for the quality of children will tend to remain unchanged. Thus the supply function in Figure 2 remains fixed in this case, and only the normal income effect applies.

These contrasting situations demonstrate a point made earlier: that the way increases in mean real income in a community are generated may well have an important bearing on whether this economic growth will result in a rise, or a fall, in the level of demand for the number of children. That said, it remains to test the relative importance of the three identified channels of causation running from changes in mean real income through to changes in the level of fertility. The regression results set out in equation 2 allow the inference to be drawn that the quantity-cum-quality, and the opportunity-cost-

¹⁷ This seems to be the general situation in most developing countries which have expanded their economies comparatively rapidly in the last few decades by learning how to exploit new technology, a process that was made possible by sharply increasing the level of investment in human beings. See Lucas (1993); Barro and Sala-i-Martin (1995).

for-mothers effects exist and combine to dominate, on average, the standard income effect. The alternative empirical evidence also cited (i.e. that set out in Subbarao and Raney 1995) suggests, however, that only the opportunity-cost effect is of importance, and this effect dominates the standard income effect. The theory developed in this section implies, however, that this is rather an unlikely situation.

The theory set out in this section does not allow for all relevant considerations which may influence fertility levels. Such a consideration might be changes in the tastes for children: as the income level for a couple rises they acquire a taste for fewer children (Birdsall 1988:509-510). Certainly the regression results presented in equation 2 are also not inconsistent with this line of argument since the term, $-0.709 \log(\text{GNP}_i/n_i)$, in equation 2 may simply be acting as a proxy for the shift in tastes just assumed to take place.

These various comments imply that the empirical results cited in the previous section do not provide an adequate or cogent test of the theory set out in this section. What is required is a far more direct test of this theory. Above all, what is required is information which directly records the reasons why couples alter their desires for a particular family size in situations of economic change. Fortunately such information does exist.

Some pertinent micro-survey data from central China

The information concerned is drawn from some evidence based upon a study of three villages in central China (Shaanxi Province) in the 1980s and early 1990s. In these villages Greenhalgh, Zhu and Li (1994) found that the crude birth rate¹⁸ fell sharply from an average level of 30.1 for the period 1984-1987, to a level of around 13.0 for the period 1988 up to mid-1993. In addition, in the late 1980s two major changes influenced these communities: first, a more intensive application of family planning policy and, second, a sharp increase in the level of real income received by the average household in the villages concerned.¹⁹

Before going further it is useful to indicate, with a few pertinent comparisons, how remarkable were these changes in the crude birth rate in the villages concerned (World Bank 1995:Tables 1, 26). The first comparison is with the change in the weighted average crude birth rate for all low-income countries, excluding China and India. It declined from 45 in 1970 to 40 in 1993. In the case of all middle-income countries the decline was from 31 to 23 over the same 23-year period. Naturally these figures reflect much slower annual rates of decline compared to that experienced in the Chinese villages. Finally, and most remarkable of all, the crude birth rate in the Chinese villages in the early 1990s was the same as the weighted average crude birth rate for the *high-income* countries in the world in 1993:13 per thousand of the population.

What is particularly noteworthy about this latter comparison is that there are two factors which suggest that the crude birth rate should be higher in the Chinese villages than that for the high-income countries. First, the crude birth rate in a community is likely to be higher the larger is the proportion of the total population in the age group 15 to 45 years, other things remaining the same. While in 1993 this proportion almost certainly was larger in the Chinese villages than that for the high-income countries, yet both regions had the same crude birth rate. Second, the weighted average per capita income for the high-income countries in 1993 was US\$23,090 (measured at current international

¹⁸ Number of births per 1,000 mid-year population.

¹⁹ Greenhalgh et al. (1994:373) do not distinguish between real and nominal changes in per capita income, but it is presumed here that they are referring to real income changes.

prices): a figure many times greater than that for the three villages in central China in the same year.²⁰ Again this is a consideration which suggests that the Chinese villages should have had a crude birth rate in 1993 higher than 13.

Turning to consider in more detail the sharp increase in the level of real incomes received by the Chinese villagers, over the period 1988 up to mid-1993 per capita real income in two of the villages grew by a third, while in the third village it doubled. Respondents in the surveys indicated that this change had two consequences. One was that it raised the opportunity costs for mothers of bearing and raising children (see Greenhalgh et al. 1994:381). The other, and apparently the more important consequence, judging from the remarks by respondents cited in Greenhalgh et al. (1994), was that it raised, sharply, the level of demand for the quality, relative to demand for the number of children.

What induced this marked alteration in the preferences for couples was the form of the economic growth that took place during this period: the increased application of more scientific methods to the farming of vegetables and the diversification of economic activity into small-scale non-farm enterprises. Both of these changes, in turn, required more technical skills, rather than more physical human power, to be applied in relevant economic activities if the maximum benefits were to be derived from the new technology, and expanded economic opportunities, becoming available. This point was not lost on the villagers, some of whom, in interviews, expressed the opinion that a lack of formal education to, say, the junior middle-school level was an impediment (possibly a severe impediment) to attempts to exploit more fully the improving economic opportunities. This opinion was supported with action by parents becoming far more willing to expend resources on the education of their children.

In 1987 it was not uncommon for families to pull their children out of junior middle and even primary school to perform unskilled farm labor. Today [in 1993], it seems that all couples want their children to finish junior middle school and to go on to high school and university if they can pass the entrance exams (Greenhalgh et al. 1994:379-380).

This sharp shift in the demand for the quality of children, associated with the increase in household real incomes, probably set in train the interacting responses of the form discussed in general terms in connection with equation 7 and Figure 2. The initial sharp increase in the demand for the quality of children resulted in a fall in demand for the quantity of children. The resulting increase in the shadow price ratio, π_n / π_q ($:= (p_c q / p_c n)$), quite possibly also induced further rounds of adjustments with additional resources being invested in the education of children and yet further declines in the demand for the quantity of children. Such an interactive process still seems to have been in progress at the time, mid-1993, of the last interviews reported by Greenhalgh et al. since the villagers concerned were still increasing the level of their investments in the quality of their children by spending more on the expansion of the local education system, and seriously contemplating sending their children away, if they had not done so already, for further education in the regional towns or cities.

Just such an interaction process was necessary to explain most of the previously-emphasized remarkably rapid decline in the level of the crude birth rate in the Chinese villages. The rest of this decline could then be explained by the increase in the opportunity cost of time for mothers in bearing and caring for additional children. But it would seem that this increased cost could only explain a comparatively small proportion of the fall in the level of the crude birth rate, although it is not possible

²⁰ The per capita income for China in 1993 was US\$2,330. Added to this fact is that Shaanxi is one of the poorer provinces in China with a per capita income (in 1989) some two-thirds that of the national average (see World Bank 1993a:37; 1995:220).

to confirm this conjecture with firm empirical evidence (if any could be found).²¹ As for the role of the family planning program in the villages concerned, its relative influence on reducing the level of the crude birth rate, while difficult to measure with any precision, probably was only marginal.

Some micro-survey data from India

It is also useful to compare the relevant experiences of these three villages in central China in the 1980s and early 1990s²² with that for a sample of rural households surveyed in India in the 1960s and early 1970s (see Rosenzweig 1990:S52-S56). These households were split into those which were in a relatively favourable geographic position, and those which were not, to make use of the new region-specific agricultural ('Green Revolution') technology which became available in India in the early 1960s. To increase the benefits to be derived from this new technology it appears to have been discovered in the first group of households (called A) that the level of education needed to be raised. This response to the new technology is reflected in the fact that in A there was a relatively large proportionate decline in the percentage of male children not receiving primary school education, compared to that experienced by those households (called B) which had little scope to exploit the new technology: in A there was a 56.2 per cent decline while in B it was 30 per cent. In addition, the agricultural real wage rates paid in A rose by 24 per cent for males and 12.7 per cent for females, but increased only by 6.4 per cent for males and 3.4 per cent for females in B.

Given these facts, along with the previous discussions and the relevant evidence for the villages in central China, it is not surprising to find that the number of infants born to the average female in the age group 25 to 34 years fell by a larger proportionate amount in A (11.6%) than in B (2.6%). It is also noted by Rosenzweig (1990:S55) that this relative change in fertility levels took place without the application of a direct family planning program.²³

Yet while this information is not inconsistent with the quantity-cum-quality, and the opportunity-cost-for-mothers, theories of fertility, it only provides indirect evidence in support of these theories. Relevant changes in behaviour can only be inferred from the facts provided. Nevertheless, what does allow greater weight to be placed on this evidence drawn from Indian data is that it is consistent, in broad qualitative terms, with that for the three villages in central China for the 1980s and early

²¹ Greenhalgh et al. (1994:80) were aware that the information they provided was consistent with the quality/quantity of children hypothesis. The discussion, however, is attempting to give particular emphasis to the information they provided.

²² There is also some additional relevant information, to be found in Schultz and Zeng (1995), which is derived from cross-section data for parts of China in 1985. This data set does not allow, however, the theoretical issues raised here to be tested in the direct fashion that is possible with the aid of the information provided by Greenhalgh et al. Rather, only inferences can be drawn from the probit regression results presented by Schultz and Zeng. For example, after allowing for other factors, their results suggest that a rise in the education level for females reduces the level of fertility. It may be inferred from this result that as the opportunity cost to mothers of acquiring children rises so the level of fertility declines. In addition, and again after allowing for other considerations, Schultz and Zeng find that the fertility rate is lower in those households whose members are employed in economic activities which require the use of comparatively skilled labour. One tentative inference that may be drawn from this empirical result is that the couples concerned are more aware of the need to expend resources on improving the quality of children born into their families rather than acquiring more children.

²³ Rosenzweig (1990:S55-S56) recognized that he had some difficulty in explaining the size of the proportionate fall in the level of fertility for the households in A. The source of this problem seems to be that the neoclassical economic model of the household behaviour devised by Rosenzweig did not make use of a non-linear budget constraint in the way discussed above in the section on 'non-linear budget restraints'. As a consequence the general theory he developed did not possess a set of terms, as is the case in equation 7, which allowed for the possible interaction between quality and quantity effects.

1990s: evidence which, as pointed out earlier, allows a far more direct test of the main thesis of interest here.

The influence of the revised family planning policy in the villages in Central China

Returning to consider the Chinese case alone, the various changes in the shadow price ratio, π_n/π_q , must have interacted with the family planning policy since, according to Greenhalgh et al. (1994:387), households became more receptive to the information provided by this program. What is clear, however, is that the influence of the expanded family planning policy from 1988 on should not be over-emphasized in any explanation of the fall in the crude birth rate in the villages concerned.²⁴

To explain this assertion, and in addition to the theoretical points made earlier in footnote 16, it is pointed out that family-planning services played essentially a passive role during the various changes experienced after 1988. As evidence of this, first it is noted that the provincial government stated that it would pay, to both parents in a two-daughter household, a pension of 60 yuan a month on reaching the age of sixty if the mother agreed to undergo sterilization. Clearly the economic value of this pension, when appropriately discounted, is likely to be small (relative to the other sources of income for the couple) since it is to be paid so far into the future. In addition, before the payment of the pension many relevant factors could change which might reduce its real value.²⁵ Therefore, this element of the family planning policy does not seem to provide an acceptable substitute for the potential old-age support to be derived from having sons in a family. Thus any influence that the family planning program may have had on the level of fertility in these villages seems to have been due to a growing demand for the facilities provided by this program rather than any increase in the supply of these facilities.²⁶

Real income changes and variations in the TFR in Sub-Saharan African countries

Now that the quality-cum-quantity of children hypothesis, in particular, and the opportunity-cost-to-mothers assumption have been more firmly established as being consistent with relevant household behaviour, a further implication of this theory can be more confidently deduced from equation 7. If this implication is confirmed by some relevant facts then this is further reason not to reject the quality-cum-quantity of children hypothesis.

To derive this implication, consider a poor country in which the broad application of improved technology in the economy has hardly begun. As the level of mean real income for this community

²⁴ As for the situation in, or just before, 1988, the evidence for China as a whole is that the family planning policy was having little influence on the level of the TFR. After assessing the data for Hebei province, drawn from the Two-per-Thousand National Fertility Survey conducted in 1988, Li (1995) points out that the one-child policy was having little influence on women in rural areas who wanted to have more than one child. In these areas, of those having more than one child, only ten per cent were provided with a permit to have additional children. Schultz and Zeng (1995:344) also recognize that the family planning policy for the mid-1980s in China can explain only a small proportion of the decline in the TFR there between 1979 and the mid-1980s.

²⁵ It is implied by Greenhalgh et al. (1994) that the pension is designated in nominal terms, not real terms. Since the rate of price inflation in China in the late 1980s and early 1990s was 10-30 per cent, the real value of the pension would soon erode to very little if this rate of inflation persisted into the future.

²⁶ This also seems to have been the situation in Indonesia in the mid-1980s. Listing data for this country, Gertler and Molyneux (1994) attempted to disentangle the influences on the TFR of the demand for family-planning services and the supply of these services. The empirical results suggest that changes in the level of demand for contraception had by far the greater influence on reducing the TFR in that country. The influence of the supply of family planning on reducing the TFR was difficult to assess, however, since, as Gertler and Molyneux imply, the supply of this community service was not varied appreciably during the period under consideration.

increases it seems reasonable to assume, therefore, that the quality-cum-quantity of children effect is likely to be insignificant. In these circumstances, and even if the opportunity-cost-for-mothers effect is present, it is likely that the pure income effect for children will dominate in these early stages of economic development, other things remaining the same. Thus as the level of mean real income increases (resp. decreases) the total fertility rate will tend to rise (resp. fall), given that the number of children is a normal good in these poor communities. This may be called the Malthusian case. As this economy develops further, however, through the process of the introduction of improved technologies, eventually the quality-cum-quantity of children, and the opportunity-cost-for-mothers, effects come to dominate and the fertility rate begins to fall as the level of mean real income increases in this now less poor community. Thus one way of testing the model of fertility behaviour represented in equation 7 is to determine if the Malthusian case applies in poorer countries.

There are some pieces of recent empirical evidence that bear on this matter. The first piece of evidence is drawn from a regression equation estimated by Barro and Sala-i-Martin (1995) making use of cross-country data. Based on the results they obtained, Barro and Sala-i-Martin (1995:453) estimated that as the level of mean real income rises over the range from zero to \$767 (in 1985 US dollars) so the level of the TFR also rises. Above this mean income level the level of the TFR falls as the level of mean real income rises.²⁷ While this result is not inconsistent with the theory set out in the previous paragraph, again other factors may be at work which explain this link between changes in the TFR and changes in the level of mean income. For example, the change in the level of mean income may simply reflect changes in the level of knowledge concerning the controlling of fertility. Indeed, as the regression results presented in equation 2 indicate, once family planning effort is allowed for (amongst other things), then the Malthusian case does not apply and there is an inverse relationship, over all income levels, between the level of the total fertility rate and the level of mean income.

This observation indicates that additional methods need to be found to determine if the Malthusian case does apply in some, if not all, poor countries. The alternative method used here is based on considering relevant data for a range of sub-Saharan African countries whose rural populations, during the 1980s, tended to experience either a decline, or only comparatively small gains, in mean real incomes. These countries are some of the poorest in the world (see Table 1). In the World Bank tables of development indicators there are 132 countries listed of which 31 are in sub-Saharan Africa. If the world poverty line is drawn at US\$2000 per capita, then 26 of these African countries could be considered to be poor in 1992 (World Bank 1994). These facts suggest that these African countries did

²⁷ The truncated form of the regression equation that Barro and Sala-i-Martin (1995:453) estimated was the following:

$$TFR_i = a_{oi} + 0.93 \log(GNP_i/n_i) - 0.070 [\log(GNP_i/n_i)]^2 + \text{various measures of education, where the}$$
 coefficient estimates shown in this equation were different from zero at the standard levels of statistical significance. An attempt to estimate a version of this equation, based on equation 2, had unsatisfactory results. The estimate for one of the regression equations considered was the following:

$$\begin{aligned}
 TFR_i = & 9.401 - 0.814 \log(GNP_i/n_i) + 0.036 [\log(GNP_i/n_i)]^2 \\
 & (8.704) \quad (-1.819) \quad (0.042) \\
 & + 0.984 D_{i1} + 0.753 D_{i2} - 0.689 \log HDI_i - 1.094 \log FPE_i \\
 & (3.252) \quad (3.252) \quad (-2.714) \quad (-6.693)
 \end{aligned}$$

Besides the coefficient estimate for $\log(GNP_i/n_i)$ squared not being significantly different from zero, this coefficient also does not possess the required sign.

not experience any marked changes in the application of improved technology during the 1980s. Thus there was probably little change in the average level of demand for skilled labour in these countries over this period.

Within this context the initial discussion in this section suggests the following thesis needs to be tested: during the 1980s and early 1990s the direction of change in the TFR in sub-Saharan countries tended to bear a positive relationship with the direction of change in the level of real income per capita for these countries.

Some relevant data required to test this thesis are set out in Table 1. Since in the 1980s most people in the countries listed there lived in rural areas,²⁸ use is only made of the average rate of growth of agricultural production per capita over the period 1980-91 in the countries concerned.²⁹ This agricultural output information is compared with that for the levels of the TFRs for the relevant countries for the years 1987 and 1991. In addition, in Table 1 countries are grouped into those for which there is a positive, or no, relationship between the rate of growth in agricultural output per capita and the change in the level of TFR; and those for which there is a negative relationship.

A more sophisticated manipulation of these data, other than this grouping of them, does not seem appropriate, remembering that there is a complete absence of additional relevant data for all the countries listed. In view of this dearth of information, heavily qualified judgements need to be applied when interpreting the information set out in Table 1.

Others have noted that from the early 1980s to the early 1990s a number of sub-Saharan African countries experienced a decline in the TFR at a time when the rural populations in these countries also suffered from declining economic fortunes (see Caldwell, Orubuloye and Caldwell 1991:237; Lesthaeghe and Jolly 1994:238; Dow et al. 1994:357). This observation is also confirmed by the data set out in the upper part of Table 1. Those countries that did experience a rise in rural per capita incomes also, with one exception (Nigeria), experienced a rise in their TFRs. Thus 70 per cent of the sub-Saharan countries listed in Table 1 experienced, in the 1980s and early 1990s, changes in TFRs not inconsistent with the Malthusian thesis.

In Botswana in the late 1980s and into the early 1990s a severe drought came to an end. The resulting rise in rural household incomes in that country was accompanied by a rise in the TFR in the rural areas (see Diamond and Rutenberg 1995). This is just what the theory of demographic change being tested here would predict in a rural community where there seemed to be little reason for couples to increase the level of investment in the quality of their children.

As for those countries which experienced demographic change inconsistent with the Malthusian model, there appear to have been other factors, besides just normal income effects. The growth of the relative size of the urban population probably was one such factor. In the instance of Nigeria the proportion of the total population living in urban areas grew from nine per cent in 1970 to 20 per cent in 1991, while for Tanzania this proportion grew from seven per cent to 34 per cent over the same period (World Bank 1993b:Table 31). It is also known that the TFR is lower in urban than in rural areas in sub-Saharan African countries (Locoh 1994:119). This growing urbanization may represent, however, a whole range of socio-economic changes which impinge on household behaviour. One of these socio-economic changes may have been a growing level of investment in the quality of children.

This idea also seems to be supported by some of the demographic changes experienced in Botswana in the 1980s and 1990s. As noted earlier, the TFR for the rural community in that country

²⁸ In some countries about 40 per cent, but usually a much smaller proportion, of the total population lived in urban areas. See World Bank (1993b:Table31).

²⁹ These data are not particularly reliable for developing countries where a sizable proportion of agricultural output does not enter the monetized market system. See World Bank (1993b:308). Data for the rate of growth of Gross National Product per capita are not used since this information will, for some countries, strongly reflect the influence of mining, an economic activity which may well only benefit a comparatively small section of the population.

rose in the early 1990s. The TFR continued to decline, however, in the urban areas of Botswana at a time when the average urban household real income was increasing (Diamond and Rutenberg 1995).

This continued fall in the TFR in urban areas was presumably a consequence of the greater level of demand for human technical skills, as well as the greater access to basic health care, schooling and advice on family planning in the urban areas of Botswana compared to that found in the rural areas.

Despite these conflicting results, the broad conclusion that seems reasonable from the information set out in Table 1 is that the Malthusian case of fertility change influenced demographic change for a sizable proportion of sub-Saharan countries in the late 1980s and early 1990s. This is what the theory based on equation 7 would suggest given that these countries are absolutely poor, or near-poor, which, in turn, implies that the communities in them expend relatively small amounts on the quality of children. As for those sub-Saharan countries, identified in Table 1, for which the Malthusian case does not seem to apply, the demographic change experienced by them in the 1980s and early 1990s still needs to be explained.

From these observations it does not seem that, around 1990, the fertility transition had begun in any sustainable way in the average sub-Saharan country. For this fertility transition to be sustainable it seems, particularly with the insights provided by the recent demographic experiences in a part of central China, that more effort needs to be devoted to altering the mechanisms through which increases in household real incomes in sub-Saharan countries are generated. Such mechanisms would need to create an increasing level of demand for skilled human power in these countries. This change, in turn, would create the incentive for couples to invest more in the quality of their children at the expense of acquiring a greater quantity of children. A subsidiary consequence of this change in incentives is that probably they would induce a greater demand for family planning services.

Table 1
Pertinent economic and demographic data for a range of sub-Saharan African countries

Country	Rate of growth of agricultural output per capita	Total Fertility Rate ^b		GNP per capita current intl prices
	1980-1991 ^a	1987	1991	1992 ^c
Countries for which data not inconsistent with the thesis				
Botswana	-0.5	6.7	4.9	5,190
Burkina Faso	0.6	6.5	7.2	730
Cameroon	-1.7	5.9	5.8	2,300
Central African Republic	-0.3	5.9	5.6	1,040
Congo	-0.1	6.8	5.9	2,450
Ghana	-2.01	6.5	6.3	1,890
Kenya	-0.6	8.0	6.7	1,360
Rwanda	-4.5	8.5	8.1	770
Senegal	-0.3	6.7	6.5	1,,750
Sierra Leone	0.3	6.2	6.5	770
Tanzania	1.4	7.1	7.1	630
Togo	1.9	6.6	7.2	1,100
Zimbabwe	-1.2	6.5	5.6	1,970

Zambia	-0.3	7.8	7.2	-
Countries for which data inconsistent with the thesis				
Côte d'Ivoire	-5.0	6.7	7.4	1,640
Madagascar	0.6	6.1	6.6	720
Malawi	-1.1	7.0	7.7	730
Mali	-0.2	6.7	7.1	600
Mozambique	-1.0	6.1	6.3	570
Nigeria	0.5	6.6	6.0	1,440

Sources: a: World Bank (1993b:Tables 2, 26); b: Locoh (1994:130); c: World Bank (1994:Table 30).

Conclusions

Part of the previous discussion indicated that, because of the dearth of suitable information, it is rather difficult to provide a satisfactory test for the quality-cum-quantity of children hypothesis. In the attempt to provide reasonably convincing tests a particular strategy was adopted. To begin with, a flexible version of the relevant theory was constructed to indicate the general set of circumstances where the quality-cum-quantity of children hypothesis is likely to apply; and when it does not and the Malthusian case is likely to obtain. This theory indicated the information required to provide a direct, and strong, test of the hypothesis. Information near to the required form is available: information from central China in the 1980s and early 1990s. Indirect, but much weaker, tests of this theory were provided by relevant information drawn from India in the 1960s, and sub-Saharan Africa in the 1980s and early 1990s. Overall these various tests were not inconsistent with the theory of when the quality-cum-quantity of children hypothesis is likely to be satisfied, and when it is not, and the Malthusian case applies.

One of the implications of this testing of this theory is that the type of economic growth taking place in a community is likely to influence how much the increase in mean income will reduce the total fertility rate in this community. Another implication of this testing is that it seems difficult to predict, reasonably accurately, TFRs over the medium to longer term for a developing country in which dynamic economic change is taking place, or is likely to take place. This is so because in these circumstances various relevant variables will probably interact in complex ways to influence the fertility rate, and it seems difficult to predict the extent of the influence of these interacting effects. Yet when these interacting effects are prevalent, they may have a marked, if not dramatic, influence in reducing fertility rates, as was the case, apparently, in an area of central China in the 1980s and early 1990s. When these interacting effects are more muted then changes in the level of fertility rate may take a rather different course.

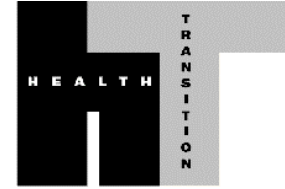
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Life course perspectives on women's autonomy and health outcomes *



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Abstract

This paper examines how different patterns of kinship and inheritance affect intergenerational relationships and the ramifications of gender inequality. Peasant societies of pre-industrial Northern Europe are contrasted with those of contemporary South Asia to illuminate some of these relationships. While Northern European kinship and inheritance systems made for high status in youth and a loss of power and status as people aged, South Asian systems make for lower power and status in youth and a rise as people age.

From this follow more conflict-ridden relationships between the generations and a stronger conjugal bond in Northern Europe, while in South Asia intergenerational ties are strong and the conjugal bond is weak. This in turn leads to a greater potential for marginalizing women in South Asia, although gender inequality exists in both settings. The convergence of low autonomy due to youth as well as sex amongst young married women in South Asia means that women are at the lowest point in their life cycle in terms of autonomy during their peak childbearing years. As shown in this paper, this has considerable implications for demographic and health outcomes: in terms of poorer child survival, slower fertility decline, and poorer reproductive health.

In recent decades, a great deal has been written in the social sciences on the subject of female status and autonomy in both developed and developing country settings. A subset of this literature has specifically pointed out some of the negative demographic consequences of low female autonomy. In particular, low levels of female education and autonomy have been perceived to be barriers to improving child survival and reducing fertility.

Much of this literature focuses on the low status of women relative to that of males. Yet there is also a large body of evidence, especially in the anthropological literature, that a woman's status rises and falls over her life cycle. Several studies highlight the fact that in some societies, women have higher status when they are younger, while in others it is when they are older (Bart 1969; Foner 1984; Vatuk 1987; Yanagisako and Collier 1987). Bart views this as an intertemporal 'zero-sum game', in that status being high at one point of the life cycle is dependent on its being lower at another point.

* This research was supported by a grant from the Ford Foundation and by a grant from the Mellon Foundation to Brown University. comments from David Bell, Andre Bteille, Gene Hammel, John Hobcraft, David Kertzer, Bob Levine, Sylvia Vatuk and two anonymous reviewers were very helpful in revising the paper. I am especially grateful to Debraj Ray for reading and commenting on several drafts. Reprinted by permission of the American Anthropological Association from *American Anthropologist* 97:3, September 1995. Not for further reproduction.

This statement can, of course, be extended to men. Both men and women spend part of their life cycle in a position inferior to that of others of their own sex. This is quite independent of the question of gender inequality, in which it is common for women to have less power and autonomy than men at any given point in their life cycle. Thus in many

societies, women spend part of their life cycle in a situation of double powerlessness: they are in a subservient position not only to *men*, but also to other *women* who are at a different stage of their life cycle.

This paper begins by contrasting patterns of household formation and inheritance in peasant societies of pre-industrial Northern Europe and Northern India, discussing how these patterns are linked to the acquisition or loss of power over the life cycle. It goes on to argue that whether women's status is higher in youth or in old age makes a critical difference to health and demographic outcomes. This is illustrated with data from my fieldwork in Northern India¹, and from other studies in South Asia.

Household formation patterns and swings in life cycle autonomy

Two basic patterns of life-cycle shifts in autonomy can be summarized crudely as follows:

	Married youth		Older ages
PATTERN 1	Higher autonomy	→	Lower autonomy
PATTERN 2	Lower autonomy	→	Higher autonomy

Societies falling into Pattern 1 are those in which autonomy is highest amongst young married adults, and falls with the process of ageing. The reverse is the case in societies falling into Pattern 2, where power and autonomy rise with age, and begin to dip again only at extremely old ages (the old-old). The distinction made between power, authority and autonomy (Lamphere 1974; Mason 1984; Vatuk 1987) is important to this discussion, although all three are subsumed under the shorthand of 'autonomy' in the above dichotomy.

The examples of both the 'Pattern 1' as well as the 'Pattern 2' societies discussed here are characterized by gender inequality, that is, of women being socially subordinate to men. This similarity highlights the importance of differences in power between women at different stages of the life cycle in influencing demographic outcomes.

Pattern 1 societies

This discussion of Pattern 1 societies is based on Northern European peasant societies which had impartible inheritance and nuclear or stem families. It is based primarily on Berkner's (1972) study of eighteenth-century Austrian peasant households, but also uses similar accounts emanating from nineteenth-century Scandinavia (Gaunt 1987; Plakans 1989; Sorensen 1989) and from nineteenth-century Austria (Sieder and Mitterauer 1983).

Under this family system, property and managerial power were retained by the head of household until he retired. Retirement and property transfer typically took place at the time of the heir's marriage. It was common for a retirement contract to be drawn up, specifying where the old couple would live, and what obligations the heir had for providing the retired parents with food, fuel and other material support (Berkner 1972).

For the new couple, this meant that they started out with an independent economic base, and were in control of all decisions relating to their household. For the old couple, of course, it meant a very sudden reduction in power and status. The strong intergenerational conflict

¹ This consisted of a study of village Ramput, which was originally studied by Oscar Lewis in the early 1950s, and of a study of eleven villages in Ludhiana District, Punjab, also earlier studied in the 1950s (Wyon and Gordon 1971).

arising out of this sharply discontinuous system of transfer of property and authority is discussed and illustrated with contemporary accounts by several historians, and summarized by Plakans (1989:177): '...there is now something like a consensus that the treatment of the old was harsh and decidedly pragmatic. Dislike and suspicion, it is said, characterized the attitudes of both sides'.

This discussion of intergenerational relationships focuses on the relationships between men, which follows from the fact that these societies were patrilineal in terms of inheritance and patrilocal in residence. This did not extend to having patrilineages, in the sense of corporate groups. Land was passed on to a son, so the tension over retirement contracts revolved essentially around the father and son. Much less information is available on how women fared under this system: 'the sources speak most revealingly of men and mention spouses as an afterthought and female heads as a transitory phenomenon' (Plakans 1989:191). However, it seems that the mother was also centrally involved in her role as the wife of the retiring farmer, who would share with him the comforts or discomforts of retired life.

The incoming wife was of course an outsider to the household. Depending on how far away her own family was, she might have considerable or negligible contact with them. In describing the position of the new wife in mid-twentieth century rural Ireland, Arensberg and Kimball (1968) recount how strongly some of these women missed their homes and the familiar people there. However, the emphasis on a strong conjugal unit facilitated the woman's situation:

Nevertheless, stranger as the new woman may be, the norms of the community in ordinary cases demand that the young husband take the part of his wife. The bond between them is stronger than that between son and parent (Arensberg and Kimball 1968:128).

Thus the independence of the new couple meant that the woman had a high degree of autonomy in household matters, subject only to her husband's acquiescence.

Of course, there was considerable variation over time and place in the details of the operation of kinship and inheritance in Northern Europe. A somewhat stylized version of it has been presented here, highlighting its essential features in order to throw into relief the contrast with inheritance and household formation patterns in Northern India. Others have earlier found it useful to draw stylized contrasts between these systems (Goody 1990; Hajnal 1982). Moreover, only the lifecourse of the landowning peasants is discussed here. The lifecourse of those lower down in the socio-economic hierarchy could be entirely different: for example, the high prevalence of non-marriage meant that many never established a household of their own.

From the point of view of health and demographic outcomes, the important contrasts with Northern India hinge around the strength of the conjugal bond on the one hand, and the extent of intergenerational bonding on the other hand. Amongst these Northern European peasants, the conjugal unit seems to have been the most important in economic, social and emotional terms. The viability of the farm itself depended on the joint viability of the couple in charge. The couple *was* the joint enterprise, recruiting help as needed through childbearing and hiring servants. Though women might come as strangers into their husband's home, they came as the important and explicitly-acknowledged partner in the husband's enterprise. The strong focus on the conjugal bond was paralleled by weak and inherently conflict-ridden intergenerational links.

Pattern 2 societies

This discussion of Pattern 2 societies is based largely on contemporary rural Northern India. Occasional references are made to Bangladesh and to China, as their family and inheritance

forms have much in common with Northern India. Household formation in such societies follows the model of the multiple or joint family (Laslett 1972), in which the transfer of managerial power and property is made gradually as the head of household ages. The sons work the land along with the father, then gradually take over managerial decisions, and finally the property is transferred to them, frequently after the father's death.

The gradual nature of the transfer of power and authority makes for much less intergenerational conflict than is described in the case of Northern Europe². The new couple typically lives with the husband's parents and does not have an independent economic base of its own. Bonds between patrikin are strong, both intergenerationally (between parents and children) and intragenerationally (between siblings). Concomitantly, there is far less emphasis on the conjugal unit. Indeed, the marital bond is viewed as a potential threat to these other bonds, and is not given much opportunity to thrive. The basic unit is the joint-household, and not the couple, as it is in Northern European peasant societies. These contrasts are essentially those between what Linton (1936) called the 'conjugal' versus the 'consanguinal' family.

The position of women in Northern Europe and Northern India have some commonalities. They are clearly in a subservient position to men. Sons ensure the continuance of the family line. An extreme but nevertheless telling example of this in Northern Europe is given by Sorensen (1989:201):

... a particular property in Hessen, Germany, was occupied continuously for more than 400 years... by a Johannes Hoss. This remarkable stability was achieved by naming all sons in the family Johannes (with varying second names to provide individual identification) through this whole period.

These similarities highlight the differences in women's position in the two settings. The emphasis on the marital bond and weakness of intergenerational ties meant that the Northern European peasant wife had considerable autonomy in the running of the household and could care for her own and her family's health as best she could. In Northern India, women have highly limited autonomy in these matters until late in their life course. Close bonds between patrikin work to marginalize the young married woman.

Another factor contributing to this difference in autonomy is the age at which women typically married in these two settings. In Northern Europe the age at marriage was higher than in Northern India, and marriage was a contract between two adults. However, the marginalization of the bride continues even when the age at marriage rises: the data presented here showing the negative health outcomes of low female autonomy are based on Punjabi villages where women's average age at marriage is close to 22 years.

It can be hypothesized that to the extent that gender-based discrimination might have existed in Northern Europe, it is likely to have been volitional in nature. For example, a man might choose to mistreat his wife, or parents might choose to favour boys over girls. In Northern India, there would in addition to this be non-volitional forms of discrimination, leading to unintended negative outcomes. For example, in caring for a cherished son, a woman and her in-laws may share the same goals but fail to reach them because of poor communication.

² Goody (1976) has argued persuasively that kinship is not an autonomous system, but that productive processes and the transmission of property shape domestic groups.

The phases of the female life cycle in a North Indian village

The following description gives some idea of the experience of being female, from childhood to old age, in Rampur, a village in Northern India.

From birth, less trouble is taken over a girl than over her brothers. The birth of a girl is not celebrated ritually as is that of a boy, and even the payments to the midwife are less. It is openly acknowledged that if a female child falls ill, she is far less likely to get prompt and high-quality treatment than a male. The young girl is trained to be tough and hardworking, yet completely subservient to the decisions of her male kin. Nevertheless, she enjoys a certain amount of personal freedom and autonomy, which she will not regain after marriage until her old age. A girl can move freely in her own village, where all the men are her classificatory brothers.

There is a tremendous discontinuity when she marries and moves to her husband's village. A girl's behaviour has to undergo a dramatic overnight transition upon marriage, and she loses almost all voice and autonomy. In her husband's village she does not know anyone, and custom requires that she remain with her head bowed and not speak. On her first visit, she has to sit silently while all the women of the family and their friends come to scrutinize her and comment loudly on whether or not she is beautiful, examine the jewellery and the dowry she has brought, and in general behave as if she were an inanimate object. Upon returning to their own village, girls say that this was a real ordeal. The spiritual rebirth of a girl when she goes to her husband's family is sometimes emphasized by their giving her a new first name. Once back in her parents' village, she is once again free to run around, to be mobile and vocal as before. These sudden transitions in the total personality must be very difficult to achieve.

A young bride's personal and public behaviour is monitored by a whole array of women, including her husband's mother, aunts, grandmother, sisters and sisters-in-law. This is not to mention all the men in the household older than her husband, who are in a position of remote authority over her, and in whose presence she cannot speak. She is at the bottom of the household hierarchy, and the more onerous household tasks are given to her, such as waking up before dawn to fetch water or churn the butter. She never knows when she will be allowed to visit her parents: this, as well as the day of her return, will be decided suddenly and capriciously by her in-laws. Cut off from the rest of her affinal village, she is usually very lonely.

Many ways are used to keep the young wife and her husband apart, to delay the growth of a bond between them. Their daily tasks have mostly to be performed in different locations. Other occasions for marital privacy are also restricted. For example, after completing the long day's chores, a young woman is expected to massage her mother-in-law's legs at night before going to sleep.

A woman's status begins to rise when she has her first son. As her sons grow, her status increases, and continues to increase as the mother of grown sons, and then as a mother-in-law. Finally as an asexual woman, a grandmother, and the female head of the household, she can have a considerable amount of say in domestic matters. Freedom increases with age, as the number of people superior to the woman in the household hierarchy decreases. This is reflected symbolically in the fact that a woman has to cover her face in her husband's village from all men who are older than her husband, and obviously as she gets older, the number of such men decreases.

When she becomes too old to work, she gradually gives up the managerial duties in the household, and takes to spending more time on less physically demanding activities such as child-minding. She is now at a stage of her life when she is free to make leisurely visits to other houses, and spend time with her grandchildren. When she is too old to move, she sits on her bed in the winter sunshine or the summer shade, in the company of her grandchildren. She

continues to enjoy a great deal of respect and autonomy until she dies *if* she has sons who are openly supportive of her.

How strong a position a woman can command in her old age depends greatly on the support of her sons. This becomes especially important if she is widowed. If a widow has no sons, or her sons take the unusual step of refusing to look after her, her position is extremely vulnerable. If her sons respect her, the rest of the household will follow suit and her position within the household will be reasonably assured until she dies.

In brief, a young married woman in Northern India is in a highly subservient position vis-à-vis her mother-in-law and other older women in the household, as well as to the men. The rules of exogamy, ensuring that women marry outside their kin group and outside their village, make it easy to understand how such subservience can be enforced. As Dyson and Moore (1983) have pointed out, one factor contributing to the higher status of women in South India is the fact that women can marry within their kin group and village, thereby retaining many of their previous relationships in their new marital situation.

The mother-son bond

Sons represent much more to their mothers than a source of support in old age. They represent almost the only means for women to build up some independent standing in the household. Women are the moving, peripheral parts of their society, while men are the permanent members of the lineage. Thus women have little intrinsic source of standing, other than as the mothers of the future men of the lineage.

Every effort is made not only to bear sons, but also to ensure that they are emotionally attached to the mother, firm supporters of the mother as they themselves grow in stature in the household. The woman is careful to bind her son to herself through a variety of measures. She can be solicitous of his needs, the gentle nurturer who cooks foods that he likes. She can allow her son to see how she suffers at the hands of her in-laws, and even her husband. She can allow him to see how hard she works and what suffering is her lot in life. She can be careful to communicate that all her sacrifices will be rewarded if only her son has a successful life, while also subtly communicating that she expects unquestioning loyalty from him in compensation for her sacrifices.

Similar strategies are reported from China (Wolf 1974; Hsiung 1993), where women are similarly deprived by virtue of their sex of other avenues for self-assertion. Unfortunately, the successful self-assertion of women through this route involves the sons' loyalty to her at the expense of their wives. Thus it contributes to perpetuating the cycle of subordination of women.

'Double powerlessness' and health outcomes

The description of the stages of the woman's life cycle in Rampur, and in other studies of Northern India³, shows a clear pattern of how a woman's status and autonomy vary over the life cycle. Briefly stated, it is low in early childhood; rises during adolescence; drops sharply upon marriage and remains low during the early reproductive years; and rises during the later reproductive years to a high in the older ages when the woman becomes a mother-in-law and grandmother, followed by a small drop at extremely old ages.

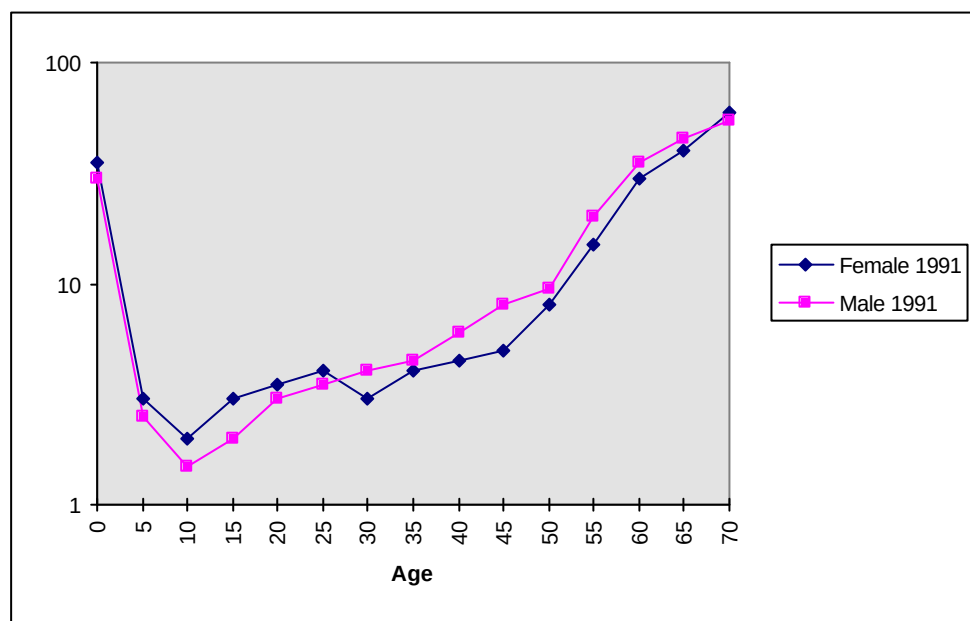
This pattern is reflected remarkably faithfully in the comparison of female and male age-specific death rates in India (see Fig. 1). Female mortality is substantially higher than male

³ Others who have looked at women's position in North Indian villages have broadly similar descriptions (see for example Vatuk 1987; Jeffery, Jeffrey and Lyon 1989; Wadley 1994).

mortality in childhood, becomes similar during adolescence, and rises again during the peak reproductive years, after which it remains lower than male mortality rates over the remainder of the life span. In societies without strong gender discrimination, female survival rates are higher than male rates throughout life. The only exception commonly found to this is in populations with high fertility, where female mortality is sometimes higher than that of males during the reproductive years. In South Asia, however, the normal biological advantage of women is offset by social and behavioural factors.

The following is a description of how women and children's health can be affected in each stage of a woman's life by the 'double powerlessness' of women in Pattern 2 societies with strong gender inequality.

Figure 1
Age-specific death rates by sex, India 1991



Child survival

Children of both sexes

It is not easy to test the hypothesis that differences in maternal autonomy influence child survival. To compare this between peasant societies of Northern Europe and present-day India would require controlling for several aspects of economic conditions and exposure to disease, which would be difficult.

One currently available option is to compare differences between women within a given society, in personal autonomy and child survival. The results are very striking. As Table 1 shows, children born in the woman's in-laws' home (the children's father's home) have over double the infant mortality rate of those born in their mother's parental home. This relationship is significant even after controlling for several factors influencing child survival,

including the household's socio-economic status, the child's sex, mother's education, and much information on the circumstances of delivery and child care (Das Gupta 1990).

The selectivity in which births take place in whose home would tend to increase the apparent gap in infant mortality between births in the mother's own home and her husband's home. The custom is for first births to take place in the mother's own home, and for later births to take place in the husband's home. First births are known to be at higher risk of dying, followed by improved survival amongst second and third births and subsequent rise in mortality of higher-order births. Given that the births on which Table 1 is based took place when the Total Fertility Rate was below 3.26, there would be relatively few higher-order births, and the preponderance of high-risk births would be among the first births. The higher mortality of children born in hospitals and clinics is explained by the fact that the great majority of births take place at home, and deliveries in hospitals or clinics contain a high proportion of emergency cases rushed to the doctor when it became clear that the labour was very complicated.

Table 1
Infant mortality rates by place of delivery, Khanna 1984-88

	(deaths in the first year of life, per 1000 live births)		
	0 months	1-11 months	0-11 months
Place of delivery:			
Mother's home	15	31	37
Husband's home	34	67	86
Clinic/hospital	27	38	41

The place of birth is an objective measure of the mother's autonomy at the time of the birth. In her parents' home, a woman is accorded the status and freedom she had before marriage. She is better able to care for her child's health because it is easy for her to ask for help if she feels that her baby is having difficulties. In her husband's home, she is much more constrained. If she says that her child needs help, this judgement may be overlaid by the judgement of her mother-in-law and others superior to her in the household hierarchy before a decision is reached⁴. The young husband, even if he is close to his wife, may not be much help because he is trained to defer to his elders, and especially to his mother where childrearing is concerned. The young mother's judgement may thus be ignored, or action may be delayed. Infants are so vulnerable that even a brief delay can mean the difference between life and death. For example, an infant with diarrhoea can die of dehydration within a couple of days.

Female autonomy as measured by a woman's own assessment of her role in household decision-making is also correlated with child survival. In an analysis of the determinants of child mortality (Das Gupta 1990), it emerged that the mother's autonomy was significantly negatively related to the probability of her children dying: the children of women who had greater decision-making authority in the household were less likely to die.

Female children

Female children suffer an additional burden because of the strong son preference in this society and discrimination against daughters. There is a large body of work on the different

⁴ Interestingly, Greenhalgh and Liang (1988) attribute high child mortality in pre-revolutionary China partly to the low status of young wives.

treatment of boys and girls in early childhood in Northern India and Bangladesh. Girls suffer from substantially higher levels of mortality during childhood, except for the first month of life. For example in Bangladesh, females experience 22 per cent higher postneonatal (1-11 months of life) mortality than boys, while in Punjab the level is nearly double that of boys (Table 2).

The crossover between the male-female ratio in neonatal and postneonatal mortality is clearly indicative of different care of boys and girls. During the neonatal period biological factors preponderate amongst the causes of death, and the higher male mortality is consonant with their being biologically weaker than females. After this first month of life, environmental factors and care-related factors become more important determinants of survival, so the substantial gender gap in survival indicates that girls receive much less care than boys. Studies in South Asia indicate that there is greater discrimination in health care than in food, and that this is the main mechanism leading to excess female mortality (Wyon and Gordon 1971; Chen, Huq and D'Souza 1981; Das Gupta 1987).

Table 2
Infant and child mortality rates by sex, Khanna and Bangladesh

		Age at death (in months)				
	<1	1-11	0-11	12-23	24-59	0-59
Khanna 1965-84						
Males	50.7	27.1	77.7	9.4	8.2	95.3
Females	43.0	51.3	94.3	18.5	12.6	125.4
Male/female ratio	1.18	0.53	0.82	0.51	0.65	
0.76						
Matlab, Bangladesh 1974-77						
Total	73.0	58.2	131.2			
Male/female ratio	1.16	0.82	1.00			

Sources: Das Gupta (1987) for the data for the Khanna Study villages, Punjab, India; D'Souza and Chen (1980) for the data for the Matlab Project data, Comilla District, Bangladesh.

An increasing volume of evidence is emerging to suggest that this sex differential in child mortality is not the result of *unconscious* neglect of girls. It is higher-parity girls (i.e. those girls born into families which already have a girl) who bear the brunt of the excess mortality (Das Gupta 1987, see Fig. 2). This has been confirmed by studies in Bangladesh (Muhuri and Preston 1991) and elsewhere in Punjab (Pebbley and Amin 1991). Female excess mortality appears to be a part of the explicit strategy parents use to obtain their desired family size and sex composition. The Chinese data suggest that similar considerations are at work there (China 1984; Hull 1990). It seems, then, that some daughters are more unwanted than others, and that the excess female child mortality is concentrated amongst them.

Given the patriarchal nature of Northern European peasant family organization, it is not surprising to find that there was excess female child mortality in eighteenth and nineteenth century Germany (Klasen 1994) and Sweden. Klasen also found that excess female mortality rose with the birth order of the child. Apparently family-building strategies in historical Germany had similar goals to those of contemporary South Asia: not to have too many children, and some preferences about their sex composition. The evidence for son preference is one manifestation of the potential discussed above for *volitional* gender discrimination in Northern Europe.

Marriage and the early reproductive years

A young woman is handicapped in coping with the stresses caused by childbearing. She lacks the autonomy to avert the consequences of reproductive stress through improved nutrition and health care, as well as a reduction in workloads. This aggravates problems of reproductive health. The substantial physical stress during the early reproductive years is reflected in poor reproductive health and high maternal mortality.

Figure 2
Child mortality rate by sex and birth order

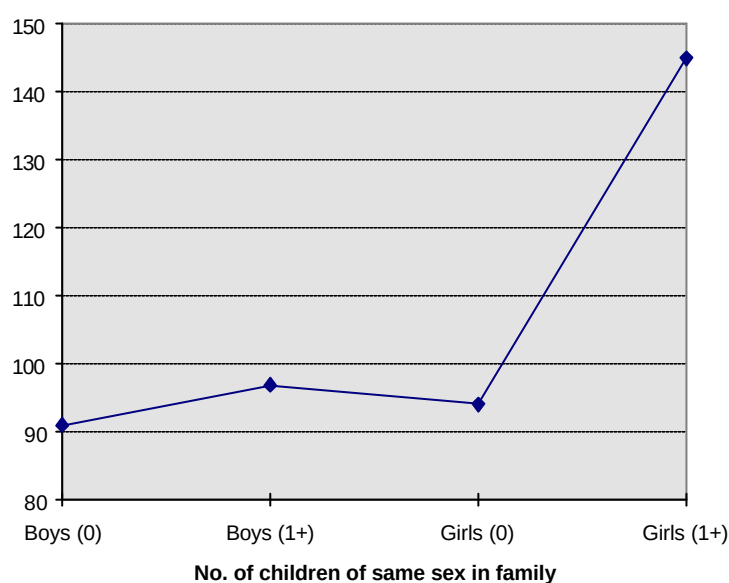


Table 3
Excess of male over female age-specific death rates, Sri Lanka

Age-group	1952-54		1962-64		1970-74	
	A	B	A	B	A	B
15-19	-26	-11	- 1	+ 8	+ 8	+11
20-24	-41	-18	-29	-12	+18	+31
25-29	-44	-23	-26	- 6	+ 6	+20
30-34	-41	-21	-26	- 7	+ 5	+19
35-39	-28	-10	-14	+ 2	+23	+35
40-44	- 8	0	+ 4	+11	+52	+58

A= all causes of death B= all causes of death excluding maternal deaths

Derived from: Nadarajah (1983), Tables 2 and 3.

Female mortality in India during the peak reproductive years is substantially higher than male mortality (Figure 1). It should be noted, however, that this is not in itself necessarily indicative of neglect of women's needs. Excess female mortality during the childbearing years is to be expected in societies where fertility is high and modern medical facilities are sparse.

As fertility declines, the sex gap in survival at these ages closes because of the reduced physiological stress of childbearing. Over time, the extra mortality of young adult males from causes such as accidents and violence comes to predominate over the stresses of reproduction, such that male mortality at these young adult ages becomes higher than that of females. This crossover of male and female mortality is commonly found in the course of the demographic and health transition. Data from Sri Lanka (Nadarajah 1983) illustrate this point very well (Table 3).

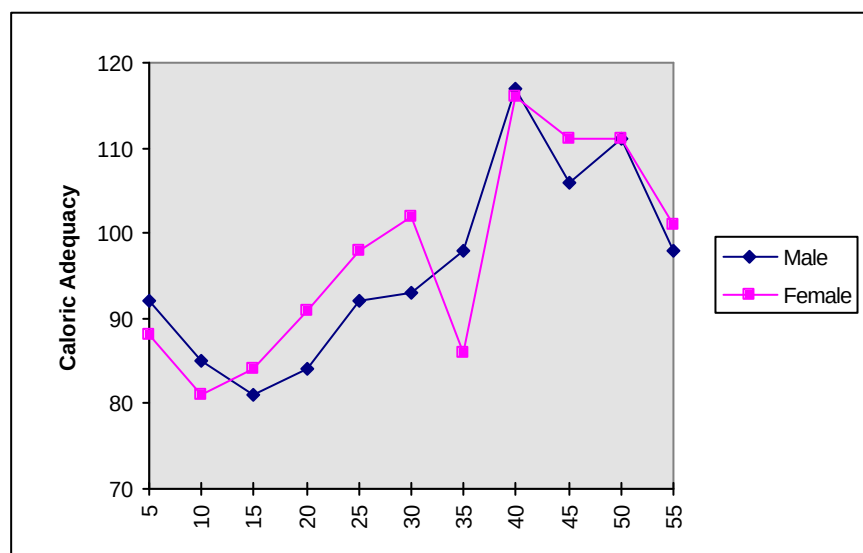
However, low female status can exacerbate the effects of reproductive stress, and slow down the pace of improvement in women's health when fertility declines and the physical toll of reproduction is reduced. This natural effect can be dampened by lack of care during the process of childbearing. Such neglect can take place in several ways.

Inadequate nutrition

The stresses of childbearing are exacerbated by inadequate nutrition and heavy workloads. As Figure 3 shows, adult women in Punjab are generally adequately nourished, except during the peak reproductive years. This dip in nutritional status is due to the fact that women's average consumption does not rise during pregnancy and lactation, although their nutritional requirements at such times are far higher. This results in startling levels of undernutrition (Figure 4), in a society which is otherwise quite well nourished.

This lack of adequate nutrition has little or nothing to do with food taboos or other reasons such as wanting to keep the foetus small to ensure an easy delivery. This was evident from answers to a prospective survey of these pregnant women. The problem seems to lie in the fact that the regular diet is bulky (bread, with some lentils and milk), and it is difficult to increase consumption of such foods enough to reach dietary sufficiency, especially during pregnancy. Pregnant and lactating women need to eat nutritionally more dense foods. Such foods, rich in milk, fats and sugars, are available in the local diet. The fact that they are not given to pregnant and lactating women suggests that their needs are being neglected.

Figure 3
Caloric adequacy in Punjab



It is not as though the connection is not made in this society between physical stress and increased nutritional needs. This is recognized for the sick, for whom special and expensive foods are bought; for cows, which are given extra oilseed cake when they are lactating; and for the research worker, who is told to eat more butter to counter the exhaustion of interviewing. Above all, it is recognized for men. Figure 5 shows how the nutritional intake of men rises with their number of hours of hard physical labour.

Figure 4
Per cent of caloric requirement met in Punjab

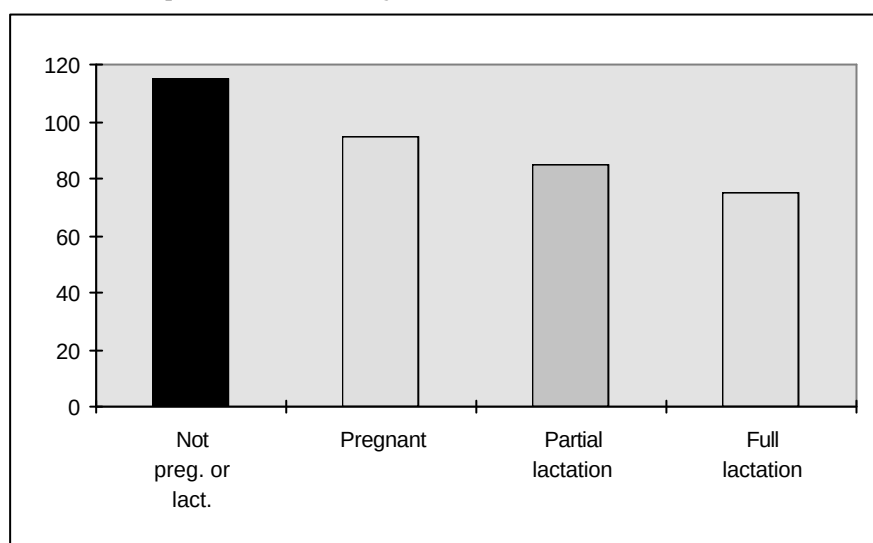
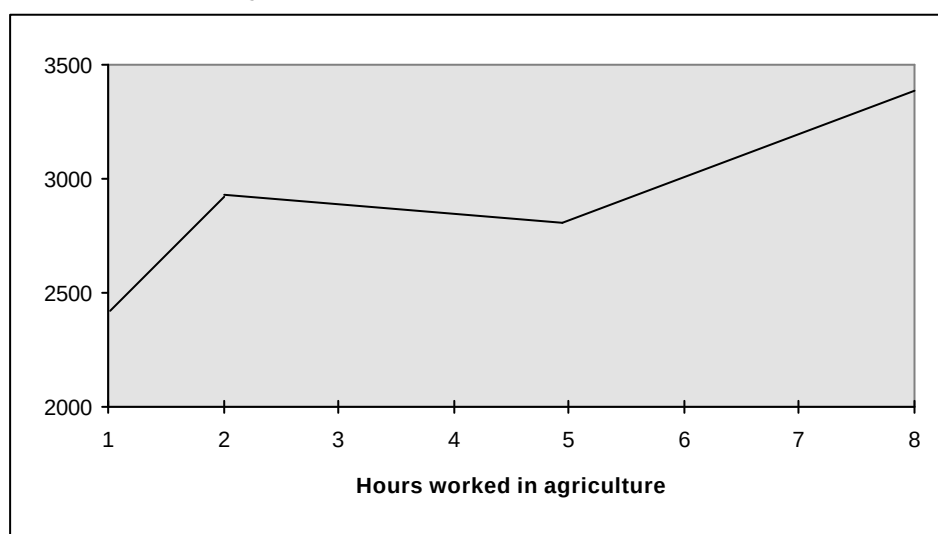


Figure 5
Male caloric intake in Punjab



Nor is it that the connection between childbearing and physical stress is not recognized. When women lose their teeth and age prematurely, it is clearly recognized that this is related to having borne children. Women are explicit in their recognition of this effect: in response to a question in my survey, a high proportion said that high fertility is bad for the health of the mother. Talking with women showed that they clearly understand that they need a nutritionally more dense diet during pregnancy and lactation, but that little effort is made to provide this to them, and they themselves feel unable to demand it. Similar findings were reported in a study elsewhere in Northern India (Jeffery et al. 1989). It is only during the days immediately following a delivery that a rich diet of fats and sugars is given to the woman, and appropriately enough this has to be sent by the woman's parental home.

Nutritional deprivation during pregnancy and lactation exacerbates the natural effect of maternal depletion from childbearing. This affects women's own health as well as increasing the probability of having low-birthweight babies, whose survival rates are far lower than children of normal birth weight. Thus the neglect of women's health translates directly into worsened child survival, as well as poorer reproductive health.

Workloads during pregnancy

Inadequate nutrition during pregnancy is exacerbated by heavy workloads, which further increase the gap between nutritional requirements and intakes. It is common for women not to reduce their normal workload much until towards the end of the second trimester, and in some cases into the third trimester of pregnancy. Many of their chores require a great deal of physical strength, energy and stamina.

As in other matters, young women are not free to choose to take more leisure on account of their pregnancy. For example, I happened to visit a woman called Surjit one day when she was over six months pregnant with her second child. Surjit was cutting fodder, a very heavy task, and her face looked pale. She told me that she had fallen down some steps a couple of days before and haemorrhaged, but was better now. Surjit would obviously have preferred to rest or do lighter tasks, but the choice was not hers. Nor was her mother-in-law uninterested in the fate of her grandchildren. In fact, she had breastfed Surjit's first child because Surjit herself had had very little milk. It is just that in chopping fodder, Surjit was doing no more than is expected of women in her society. These conditions can be imposed on women because they can usually absorb such abuse without necessarily threatening the child's life-chances. Surjit herself helped reinforce this view by giving birth to another healthy boy.

Care at delivery

Given the availability of health services in India, which is high by developing-country standards (Government of India 1987:303), it is astonishing to find that the vast majority of deliveries are carried out at home by traditional midwives. This is true even in Punjab and Haryana, wealthy states in which almost every village has good public and private health facilities within easy reach. A woman is likely to be taken to a clinic or have a doctor called only if she has serious complications of delivery. By this time, it may be too late.

A telling example of the difference in response to health problems of men and women occurred in a wealthy household in one of the study villages, located less than two miles from a fully equipped primary health centre with a delivery ward. A woman in this household had a difficult delivery, and eventually the problem was acknowledged to be bad enough to be beyond the abilities of the midwife. Arrangements were made to take her to the clinic, but she died of haemorrhage before reaching there. Yet in the same household, a private doctor was

summoned to attend to the old father who was not feeling at his best. In fact, as is frequently the case with older people who feel under the weather, there was little more to be done but give a 'strengthening injection', that is, a shot of vitamin B-complex.

Maternal mortality is, of course, a small part of the totality of women's reproductive health problems (see Jejeebhoy and Rama Rao 1995). A study in Maharashtra found that over 90 per cent of the rural women examined suffered from one or more gynaecological diseases, and that only a trivial fraction of these women had received treatment for them (Bang et al. 1989). Lack of interest among other members of the household, and among health personnel, create a situation in which a woman feels that her reproductive health problems must be borne silently as a 'woman's problem'.

The fact that a high proportion of births are still attended by poorly-trained women leads to widespread reproductive health problems in the form of complications of delivery, including prolapsed uterus and pelvic inflammation. This in turn increases the potential complications of delivery and raises infant mortality.

The combination of poor conditions of delivery and nutritional deprivation during childbearing must go a long way towards accounting for the extraordinarily high proportion (two-thirds) of infant deaths in India which occur in the first month of life (Table 4). At such high levels of infant mortality, a much lower proportion of infant deaths should be taking place in the first month of life. As many as 30 per cent of these early deaths are attributed directly to 'prematurity', and an additional 20 per cent are attributed to 'other causes peculiar to infancy'. Of this, a substantial proportion must result from low-birthweight babies as well as incompetent delivery practices. Of course, in large parts of India, poverty and chronic undernutrition make for increased reproductive stress. However, the fact that women in such an affluent and developed state as Punjab are undernourished during reproduction and have poor conditions of delivery suggests that the effects of poverty in poorer regions of India are exacerbated by neglect of women's needs.

Table 4
Infant mortality rates by age and cause of death, India 1984

Mortality rates by age at death (in months):		
	<u>≤1</u>	<u>1-11</u>
	65.8	38.2
Cause of death:	Percentage of infant deaths	
Respiratory disorders	15.2	
Fevers 6.2		
'Diseases peculiar to infancy'		
Prematurity	30.4	
Respiratory infection of newborn	10.4	
Diarrhoea of newborn	6.0	
Others (peculiar to infancy)	20.3	
Other causes of infant death	11.6	

Sources for: age at death: Sample Registration Survey data, quoted in Government of India (1987:104); cause of death: Registrar-General of India, Survey of Causes of Death, quoted in Government of India (1987:125-126).

The unpalatable fact is that it is mostly through the agency of *women* that the needs of young women during pregnancy and delivery are neglected. Day-to-day decisions about allocation of household food are made by the senior woman of the household. Decisions about delivery arrangements, the preparation of the delivery room, when to call the midwife and

whether to seek more skilled help, also fall largely within the jurisdiction of the senior woman.

The question then arises: does the senior woman not care about the fate of the child, who is often her own grandchild? Unfortunately, as illustrated by Surjit's story, the connection between care of the mother and the fate of the child is diffused by the fact that the mother can absorb much of the consequences of undernourishment and other neglect without necessarily jeopardizing the child's survival. This biological fact can be exploited in a system which is far less concerned with the welfare of the mother than of the child. After birth, the speed with which children are taken for care can be slowed down by involuntary factors, springing from the mother's necessary circumspection when communicating with her in-laws, and her low credibility as a judge of appropriate actions. The change that education brings to the balance of power between younger and older women is an important reason why educated women's children have higher survival rates.

Slower fertility decline

Yet another way in which low status of women during their early adult years is deleterious to reproductive health is that it slows the process of fertility decline. Older women formed their ideas about ideal family size a generation earlier, when family size norms were higher. While some older women are alive to the changing needs of the times, and the need to reduce fertility, others are not. Their power in household decision-making can stand between the desire of the young to have small families, and their ability to implement it. Besides, the fact that young women have limited opportunity to communicate with their husbands, and limited freedom of expression and movement, places some obstacles in the path of effective contraception. Just as in the case of child survival, a woman's ability to implement fertility decisions is reduced by her low position in the household hierarchy.

The later reproductive years and old age

In the later stages of the life cycle, women's power and autonomy in the household rise, making them better situated in terms of caring for their own needs. They are free to choose to eat, seek health care and enjoy leisure according to their wishes and the financial circumstances of the household. This makes it possible for their natural biological advantage over men to manifest itself in terms of lower mortality. As Figure 1 shows, women in India have lower mortality rates than men for all ages above the reproductive years.

It is at this late stage of their life cycle that women in Northern India gain full access to the household's resources, just as women in Northern Europe had at an earlier stage of their life cycle. Moreover, given the more complex household structure and stronger intergenerational bonds, they have access to physical and emotional support from the presence of their children and grandchildren. Thus at the later stages of the life cycle, women in Northern Indian have considerable advantages over their Northern European peasant counterparts in terms of conditions of life.

However, these women's vulnerability can rise when they are widowed, especially if they do not have the support of grown sons. Data from Matlab, Bangladesh, indicate that widowhood had the effect of raising mortality levels above those of married women of the same age-groups (Rahman, Foster and Menken 1992). A study in Bangladesh showed how widows can be rendered highly vulnerable to destitution (Cain 1981). This vulnerability is substantially reduced where there is less gender inequality, as in rural Maharashtra (Cain 1981; Vlassoff 1990).

Conclusions

The potential ramifications of gender inequality are strongly influenced by patterns of household formation and inheritance. This paper highlights this by contrasting patterns of women's life-course autonomy in two types of kinship and family systems, that of peasants in pre-industrial Northern Europe and that of contemporary Northern India.

In Northern Europe, families were nuclear or stem in form, and property and managerial power were typically transferred to the heir at the time of marriage. The conjugal bond was emphasized, while intergenerational bonds were weak and inherently conflict-ridden. Women's autonomy was thus relatively high in early adulthood, and declined in later life. Despite gender asymmetry, then, women had considerable autonomy and power in household matters during their childbearing years. Thus they were well-placed to maintain their own health and that of their children to the best of their ability.

The joint family system of Northern India makes for strong intergenerational bonds, while de-emphasizing the conjugal bond. Property and managerial power are transferred very gradually to the younger generation. Status and autonomy are low in youth and rise with age. The double marginalization of young women on account of their youth as well as their sex means that women have the greatest dip in their life cycle status and autonomy during the early years of marriage, when they are undergoing the stresses of reproduction, and rearing children through the most vulnerable years of early childhood. The young mother is constrained in voicing or responding to her own or her children's needs. Layers of people can intervene between her perceptions of need and actual decisions: her sisters-in-law, her mother-in-law, her husband, the other men in the household. This has negative effects on child survival, reproductive health, and control over fertility.

Child survival is adversely affected by the fact that the mother has limited control over crucial child care decisions. Differences in women's autonomy are clearly reflected in differences in child survival. This affects children of both sexes alike. However, female children suffer additionally from the strong son preference in this society, which results in discrimination against daughters and substantial excess mortality of girls.

Women's reproductive health suffers because the normal stresses of pregnancy and lactation are exacerbated by neglect of the women's needs. Even in a prosperous region like Punjab, which is well-nourished and well-covered by health facilities, a high proportion of women are undernourished during pregnancy and lactation, and give birth with the help of poorly-skilled midwives. In large parts of India, poverty adds to the burden of undernutrition and poor health. A toll of poor reproductive health and high maternal mortality rates ensues. Controlling fertility and thereby improving reproductive health is hampered by restrictions on husband-wife communication and on women's autonomy. Neglect of women's needs during pregnancy and delivery also contributes to stunningly high neonatal mortality rates, which constitute as much as two-thirds of India's high infant mortality rates.

It is only at the later stages of the life cycle that a woman gains autonomy and authority in the household, and the female biological advantage in survival can manifest itself. Unless she is so unfortunate as to have no sons, a woman in her old age has fuller access to the household's financial resources, as well as much physical and emotional support from younger household members. This is the stage of the life cycle at which the situation of women in Northern India and pre-industrial Northern Europe is reversed.

The spectre of widowhood without the support of sons is a powerful force making for discrimination in favour of boys, as well as for building up a strong mother-son bond and marginalizing the son's young bride. In short, the vulnerability of women in Northern India is well-designed for reinforcing and perpetuating itself with little need for direct reinforcement from the male world.

This paper has explored some of the ways in which patterns of kinship and inheritance can affect health and demographic outcomes. While gender inequality exists in both Northern Europe and Northern India, its ramifications are greatly magnified in the latter by the fact that status rises with age. This enormously increases the potential for marginalizing women, as well as for adverse demographic consequences of their marginalization, except at later ages.

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The health of the aged in India*



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Abstract

Because of declining fertility, the proportion of the aged in the Indian population has risen. Although the rise has been modest, as shown by an increase in the population over 60 years of age from 5.5 to 7.0 per cent between 1951 and 1995, by the latter date, India's experience with 65 million people of this age is unusual. The paper employs data on persons 65+ years of age drawn from the 42nd Round of the National Sample Survey, and for the analysis subdivides them into three age groups, 60-64, 65-69 and 70+. It is shown that, among population over 60 years of age, 10 per cent suffer from impaired physical mobility and 10 per cent are hospitalized at any given time, both proportions rising with increasing age. Of the population over 70 years of age, more than 50 per cent suffer from one or more chronic conditions. The very limited support provided to the old by government is brought out by the fact that even in Karnataka, one of the states with the most generous provision, only 15 per cent of persons over 65 years of age receive any type of pension.

India embarked on fertility and mortality control programs almost immediately after attaining independence in 1947. The First Five-Year Plan, implemented between 1951 and 1956, contained not only a health program to reduce mortality and morbidity but also a family planning program to reduce the birth rate. Thus, India has often been cited as the first country in the world to have started an official family planning program. The successive Five-Year Plans placed more and more emphasis on the fertility and mortality control programs; as a result, there have been considerable declines in both fertility and mortality. For example, the crude birth rate declined from about 40 per 1,000 population in 1941-51 to about 30 in 1990 (Government of India 1991:113). Similarly, the crude death rate has declined from a little over 27 per 1,000 population per year to a little lower than ten during the same period (Government of India 1991:113). The expectation of life at birth has increased from about 32 years in 1941-51 to about 59 years in 1986-91 (Government of India 1991:113). It has been projected that the crude birth rate will be lower than 28 and the crude death rate lower than nine in 1996-2000 (Registrar General 1988:17). The expectation of life at birth is projected to increase to about 65 years by 2001 (Government of India 1991:113).

* The analysis of data in this paper was supported by the Rockefeller Foundation. Facilities were provided by the Health Transition Centre, National Centre for Epidemiology and Population Health, Australian National University. I am grateful to John C. Caldwell, Pat Caldwell, Shail Jain and John McCallum for their valuable suggestions, also to Jo Healy-North for her help in the word processing.

One of the consequences of these improvements is an increase in both the proportions and numbers of the aged, that is, those who are 60 years and above, in the total population of India. Table 1 presents data on the proportions and numbers of persons aged 60 years and

above in India from 1951 to 2001. The proportion increased only marginally from 5.5 per cent in 1951 to about 6.5 per cent in 1991 and is projected to increase to about 7.4 per cent by 2001. The proportions of the aged are, no doubt, smaller in India than in the developed and some of the developing countries. But in a country like India, with a large population, reference to the proportion of the aged conceals more than it reveals and evades the real issues rather than facing them. As can be seen from Table 1, the number of old people increased from about 20 million in 1951 to about 55 million in 1991 and is projected to increase to about 76 million by 2001. At present, India ranks third among the countries in the world in terms of the absolute number of the aged and, by the year 2000, it will rank second, next only to China.

Table 1
Numbers and proportions of persons aged 60 and above in India, 1951 to 2001

Year	Numbers (in millions)	As % of total population
1951 ^a	19.61	5.50
1961 ^b	24.73	5.63
1971 ^b	32.67	5.96
1981 ^c	43.17 ^d	6.49
1991 ^c	54.99 ^e	6.52
2001 ^c	75.93	7.43

Notes: ^a Source: Mukherjee 1976. ^b Source: Registrar General, India 1984. ^c Source: Registrar General, India 1988. ^d Excludes state of Assam ^e Adjusted to 1991 population from projected population (high variant)

In India, the old have traditionally been honoured and respected. Religious texts and writings enjoined upon the sons to provide all support for their old parents. Grown-up children, especially sons, provided not only financial and material support for their parents; they also provided psychological and emotional support. Caldwell (1982:54) wrote: 'It is a fallacy to think of the value of grown-up children being merely equivalent to an insurance policy against old age and sickness'. Like the commandment to 'Honour thy father and thy mother', there is a saying in Sanskrit: *mathru devobhava* (mother is like God), *pithru devobhava* (father is like God), *guru devobhava* (teacher is like God). Those who neglected their old parents earned social opprobrium and were ridiculed. But there is already a saying, 'mother has become poison and wife sweet'. Since Independence, India has been passing through a rapid socio-economic transformation which has brought about important changes in the social profile of the people.

The rapid urbanization has resulted in a shortage of housing in towns and cities, and consequently in exorbitant house rents which act as a severe constraint on the common residence of the aged with their sons, especially, but not exclusively, for migrant families. In fact, the extended family system is gradually breaking down, yielding place to the nuclear family system. Forces of modernization, technological changes and social mobility have changed people's lifestyles and values. These changes have adversely affected traditional respect as well as attitudes of empathy and care for the aged.

The migration of younger people from rural areas to towns and cities increases the vulnerability of the old who stay behind, particularly those living in families which do not have independent production sources like land, livestock or household industry and are dependent primarily on their labour. As a result of the acceptance of fertility control by an

increasing proportion of couples, some of the aged are likely to be given less care by their children because of increasing mobility and for other reasons.

The spread of education among women, accompanied by their employment outside the home in offices and factories, leaves no time for those women to take care of old people at home. More important, there is now a greater investment by the family in the education and upbringing of children. The high cost of living, and changing priorities, affect the intrafamily distribution of income in favour of children. In the phraseology of Caldwell (1982), the wealth flow in India is turning downward. All these socio-economic changes have adversely affected the situation of the elderly in India.

Earlier studies

Old people in India, like those in other countries, suffer from a range of problems. However, 'of all the problems associated with an aging population, health care demands top priority' (Ory and Bond 1989:1). This is particularly true of developing countries where the number of people being kept alive in misery and poor health has been increasing because of modern medical technology and the expansion of primary health programs by foreign aid, which have reduced mortality without sufficiently improving levels of health. Increasing life expectancy is certainly desirable provided levels of health are improved by effectively organizing and adequately staffing the health care delivery system (Hansluwka 1986:3).

In an analysis of the status of the aged (65+) in South Asia, Martin (1990) presented their characteristics, including their health status; investigated the changes in their family situation and status; speculated about their future; and discussed general ageing policy issues and research needs.

A study by Chanana and Talwar (1987) dealt with the growth rate of the aged population in India, the dependent population in the non-productive age groups, the old age dependency ratio, sex ratio, marital status, literacy among males and females, and working and non-working aged. The health status of the aged was also analysed on the basis of the data collected in the 28th Round of the National Sample Survey in 1973. The analysis included measures of the prevalence of temporary illness and chronic diseases, the number of old people requiring medical assistance and the types of physical impairment from which they suffered, cross-classified by place of residence and sex. The study also threw light on the welfare programs for the aged being implemented in different states of India.

A study of ageing in the state of Kerala (Rajan 1989) described factors contributing to population ageing, changes in age composition, dependency ratios and structural changes, that is, changes in the age and sex composition of the population aged 60 years and above over a period of three decades to 1981.

The findings of another study of the population aged 60+ in the state of Kerala (Gulati and Rajan 1990) were very similar to those of Rajan (1989). After analysing the socio-economic and demographic characteristics of the aged, the study described the current welfare programs for them in Kerala, including the Kerala Agricultural Workers' Pension Scheme, 1980.

In a study of 460 persons aged 60+, of whom 130 men and 100 women were from 30 villages, and 140 men and 90 women were from two urban centres in Chittoor district of the state of Andhra Pradesh, Kumar (1991) focused his analysis on familial and socio-economic problems, including health problems.

Joseph (1991) made a comparative study of 411 persons: 207 men and 204 women over 60 living with families; 48 men and 44 women aged 60+ living in homes for the aged; and 257 people, 127 men and 130 women, aged 20-50 years in Kottayam district in Kerala. Joseph (1991) identified stereotypes of the aged, attitudes of the young towards them, their problems, including health problems, and their personality and religiosity.

A study by Nair (1989) of 745 persons aged 60+, 375 men and 370 women, from the rural areas of four districts in the state of Karnataka, investigated their socio-economic and health problems.

Although the main objectives were different, a study of demographic change in south India, employing micro approaches, enquired into support for the aged (Caldwell, Reddy and Caldwell 1988:187-195).

There are many other studies of old people in India which did not enquire into their health problems. Thus, most studies were comprehensive and when they covered health it was only as one of several problems experienced by the aged. These studies are important, but there is a need for studies devoted primarily to the health problems of this age group.

Objective

The objective of the present paper is to analyse the health status of the aged in India. This can be examined in different ways, ranging from their life expectancy at age 60 to their death rate. But here analysis is confined to four indicators of health status, data on which are readily available. These indicators are: the percentage of physically immobile persons among the aged; the percentage of aged persons having chronic disease; their disease prevalence rate (per 1000); and the proportion (per 1000) hospitalized. Differences in age, sex and rural-urban residence of the aged are analysed to see how they affect the four indicators.

Data and method

The 42nd Round of the National Sample Survey (NSS) conducted by the National Sample Survey Organisation (NSSO) in India during July 1986-June 1987 collected a wealth of data on 20 items regarding persons aged 60 years and above (NSSO 1991). Collection of data on the health status of the aged was not the only objective of the NSS; it also collected data on their socio-economic and demographic background, their past and current economic activity, living arrangements, familial integration, and participation in social and religious activities. The data pertaining to the four indicators listed above are analysed here.

The NSSO adopted a two-stage stratified sampling design. The first-stage units were villages in the rural areas and NSSO urban blocks in the urban areas; the second-stage units were households in both rural and urban areas. The sample villages were selected with a probability proportional to population size with replacement in the form of two independent interpenetrating subsamples. The sample urban blocks were selected using a simple random method without replacement in the form of two independent interpenetrating subsamples.

For the selection of sample households, the frame consisted of households in each of which there was at least one person aged 60 years or over. Three households were selected systematically with a random start from each of the first stage units. If, in a selected first stage unit, the number of households in the frame was found to be less than three, then all such households were selected for the survey.

The survey covered 49,693 households spread over a sample of 8,312 villages and 4,546 urban blocks. Of the 49,693 households, 32,237 were rural and 17,456 were urban. The methodology is described in detail elsewhere (NSSO 1991:103-105). The survey covered the whole of India except Ladakh and Kargil districts of the state of Jammu and Kashmir; and the rural areas of the state of Nagaland.

Findings

The findings have been tabulated by age, sex and rural-urban residence in a series of Tables, 2-7. The age groupings used are 60-64, 65-69 and 70+ years. I would have preferred the age

groupings for those over 70 to be 70-74, 75-79 and 80+ years, but the NSSO made only three age groupings.

Physically immobile aged

Table 2 presents data on the percentage of the population over 60 who are physically immobile, in different age groupings, among males and females, and in rural and urban areas. In the rural areas, the percentage of the physically immobile aged is 4.5 among the males and 6.8 among the females; the figures for the urban areas are 4.7 per cent and 6.7 per cent. Both among aged males and females and in the rural and urban areas, as age increases, the proportion of the physically immobile increases.

Table 2 shows that, in all age groupings and in both rural and urban areas, the proportions physically immobile are higher among old women than among old men. This is perhaps due to at least two factors: the frequent cycles of pregnancy and lactation experienced by women, and the hard work done by women over their lifetimes. In general, the finding indicates that aged women, like females in general, are accorded a lower status than the aged men.

Table 2
Percentage of the aged who are physically immobile by age, sex and residence

Sex	Age (years)	Rural	Urban
Males	60-64	2.4	2.2
	65-69	3.3	4.1
	70+	8.3	8.1
	All ages	4.5	4.7
Females	60-64	3.3	3.3
	65-69	4.9	4.7
	70+	13.5	11.7
	All ages	6.8	6.7
Persons	60-64	2.7	2.7
	65-69	4.0	4.4
	70+	10.4	9.6
	All ages	5.4	5.5

Source: NSSO 1991:S-126

Table 3 shows the percentage distribution of the physically immobile elderly by age, sex and place of residence. Somewhat contrary to expectation, the percentages of the physically immobile belonging to the age groupings 60-64 years and 65-69 years are about the same among rural old men and women, and also among urban old women; but, of the total number of the physically immobile among old men in urban areas, about 19 per cent belong to the age group 60-64 years and about 25 per cent to the age group 65-69 years. As might be expected, of all the physically immobile aged, the majority belong to the age group 70+ years. But the percentage of the physically immobile aged who are 70 or over varies by sex in both rural and urban areas. For example, of all the physically immobile old men, about 56 per cent in both rural and urban areas are aged 70+ years; and, of all the physically immobile old women, 60 per cent in rural areas and about 62 per cent in urban areas are aged 70+.

The chronically ill aged

The NSS collected information on seven chronic diseases. Only two alternative responses, 'yes' and 'no', were provided to the questions on those chronic diseases or symptoms of chronic diseases which could be easily identified by the respondents: they included cough, piles, problems of the joints and urinary problems. But the NSS did not probe further into the

reported chronic diseases or symptoms: it did not ask a further question whether the cough was due to tuberculosis, asthma, bronchitis or pleurisy. The objective of the NSS seems to have been only to indicate a need for care; from the point of view of intervention programs, this is not sufficient. Three responses, 'yes,' 'no' and 'not known', were provided to the questions on chronic diseases or symptoms which could not be easily identified by the respondents; they included abnormal blood pressure, heart disease and diabetes. It is entirely possible, therefore, that the proportions suffering from abnormal blood pressure, heart disease and diabetes could be higher than those reported, as some of the respondents who reported 'not known' might also be suffering from these chronic diseases.

Table 3
Percentage distribution of the physically immobile aged by age, sex and place of residence

Sex	Age (Years)	Rural	Urban
Males	60-64	22.7	19.1
	65-69	20.9	24.7
	70+	56.4	56.2
	All ages	100.0	100.0
Females	60-64	19.9	18.1
	65-69	19.9	19.8
	70+	60.2	62.1
	All ages	100.0	100.0
Persons	60-64	21.3	18.6
	65-69	20.4	22.3
	70+	58.3	59.2
	All ages	100.0	100.0

Source: NSSO 1991:S-176

The chronic diseases have perhaps become chronic because of the patient or the extended family neglecting to get proper treatment at the appropriate time, or because the health system is inadequate, especially through its inability to provide geriatric facilities and free medicines.

Table 4 shows the rather high percentage of the aged with chronic disease in different age groupings, among males and females, and in rural and urban areas. As might be expected, the percentage increases with age, for both men and women, both rural and urban. There are no large differences by sex or place of residence. The proportion chronically ill is about 45 per cent of aged men and women in both rural and urban areas.

Table 5 shows the percentage distribution of the rural aged with chronic disease by type of chronic disease, age and sex. There is not much difference by age among either men or women, but there are differences by sex. For example, the proportion suffering from cough is slightly higher among men (about 35 per cent) than among women (about 33 per cent). This may be due to the use of tobacco, especially smoking, by more men than women. But the proportion suffering from problems of the joints is higher among women (about 51 per cent) than among men (about 45 per cent); this proportion is higher among females than among males in all the three age groups. Of those suffering from chronic disease, the proportions suffering from urinary problems and diabetes are higher among men than among women. The differences in the proportions of males and females suffering from different types of chronic disease may be due to differences in social, behavioural and economic factors like education, religion, caste, smoking, consumption of alcohol and income.

Table 4
Percentage of the aged with chronic disease by age, sex and residence

Sex	Age (Years)	Rural	Urban
Males	60-64	38.3	36.8
	65-69	44.8	43.9
	70+	54.9	54.0
	All ages	45.1	44.3
Females	60-64	39.4	39.7
	65-69	44.5	42.8
	70+	52.6	53.6
	All ages	44.9	45.5
Persons	60-64	38.7	37.9
	65-69	44.7	43.5
	70+	54.0	53.8
	All ages	45.0	44.8

Source: NSSO 1991:S-194

Table 5
Percentage distribution of the rural elderly with chronic disease by type of chronic disease, age and sex

Sex	Age (years)	Type of chronic disease						
		Cough	Piles	Problems of joints	Blood pressure	Heart disease	Urinary problems	Diabetes
Males	60-64	37.3	3.9	42.5	6.9	3.4	3.8	2.4
	65-69	34.2	3.5	47.7	5.7	3.1	3.5	2.2
	70+	34.9	3.9	44.1	6.4	4.4	4.7	1.7
	All ages	35.2	3.8	44.5	6.4	3.7	4.1	2.1
Females	60-64	33.2	2.6	51.3	5.9	3.1	2.4	1.5
	65-69	33.1	2.2	49.7	6.9	4.2	2.7	1.1
	70+	31.9	2.5	50.5	6.8	4.3	3.1	1.0
	All ages	32.7	2.5	50.6	6.5	3.9	2.7	1.2
Persons	60-64	35.6	3.4	46.1	6.5	3.3	3.2	2.0
	65-69	33.8	3.0	48.5	6.2	3.5	3.2	1.8
	70+	33.7	3.4	46.7	6.5	4.3	4.1	1.4
	All ages	34.4	3.3	47.0	6.4	3.7	3.5	1.7

Source: NSSO 1991:S-194

Table 6 presents the percentage distribution of the urban aged with chronic disease by type of chronic disease, age and sex. Differences in age do not make for differences in the proportions suffering from most of the chronic diseases among either men or women, but, as in the case of the rural aged, there are differences by sex. The proportions suffering from cough, piles, heart disease, urinary problems and diabetes are higher, by varying percentages, among men than among women; but the proportions suffering from problems of the joints and abnormal blood pressure are higher among women than men. The lower levels of joint and blood pressure problems reported by males may be partly due to *macho* unwillingness to admit failing physical condition, but in a micro study of the health status of the aged in a rural setting in Karnataka (Reddy 1995), it was observed that both males and females tended to overstate their chronic diseases in the hope that the investigators would arrange some treatment or financial help from the government. In fact, many of them urged the investigators to help them in getting financial assistance from government. Differences in social and

economic factors may be responsible for differences in the proportions of men and women suffering from different types of chronic disease.

Table 6
Percentage distribution of the urban aged with chronic disease by type of chronic disease, age and sex

Sex	Age (years)	Type of chronic disease						
		Cough	Piles	Problems of joints	Blood pressure	Heart disease	Urinary problems	Diabetes
Males	60-64	24.7	4.3	34.6	18.8	7.1	4.2	6.3
	65-69	26.6	4.7	35.8	15.7	7.5	3.6	6.2
	70+	26.5	3.9	35.0	16.0	6.2	6.9	5.5
	All ages	26.0	4.3	35.1	16.8	6.9	5.1	5.9
Females	60-64	23.3	2.6	44.1	18.2	5.4	1.7	4.7
	65-69	20.8	2.5	43.0	20.5	6.0	2.4	4.8
	70+	22.7	2.6	45.0	17.5	5.5	2.9	3.8
	All ages	22.4	2.6	44.2	18.5	5.6	2.4	4.3
Persons	60-64	24.2	3.7	38.4	18.5	6.4	3.2	5.7
	65-69	24.3	3.8	38.7	17.7	6.9	3.1	5.6
	70+	25.0	3.4	39.2	16.6	5.9	5.2	4.8
	All ages	24.5	3.6	38.8	17.5	6.3	4.0	5.3

Source: NSSO 1991:S-194

A comparison of Table 5 with Table 6 is instructive. Of the aged with chronic disease, the proportion suffering from cough is over 34 per cent in rural areas and about 25 per cent in urban areas. This is true of all age groups and both sexes. This is perhaps because more people in rural areas are engaged in agricultural work and are thus exposed to dust which causes cough. Another reason may be that a greater proportion of country people than city people use tobacco. In both rural and urban areas, as expected, the proportions suffering from cough are higher among men than among women.

The proportions suffering from piles are about the same in rural and urban areas, and in different age groups, but higher among men than women.

The proportion suffering from problems of the joints is higher in rural than in urban areas. This is true of different age groups, and also of males and females. In both rural and urban areas, more women than men suffer from problems of the joints.

As can be seen from Table 5 and Table 6, the proportions of the Aged with chronic diseases who suffer from blood pressure, heart disease and diabetes are much higher in urban than in rural areas, perhaps because of differences in dietary practices and lifestyles. Perhaps, also, a greater proportion of the urban aged are likely to be diagnosed as suffering from these chronic diseases.

The chronic diseases affect both the aged and the extended family. Chronic diseases cause suffering for old people, and inconvenience and financial loss for the extended family, one of whose members must take the old person for treatment in a government or private hospital, usually far away, and must persist with treatment if the patient is not cured of the chronic disease. This may result in loss of wages for the relative who takes the patient to hospital. If the treatment is in a private hospital, the extended family has to pay the doctor's fee and purchase medicines; even when the treatment is in a government hospital, the extended family is often required to purchase medicines. Additionally, the family may have to spend money on transport to and from hospital. But the community and the state are not really affected by the chronic diseases of the aged. The community may not do anything more than show sympathy; the state expects people to avail themselves of the free services provided in

government hospitals; drugs and medicines are also provided, if available. The extended family has to take care not only of the chronic disease and disability of the aged, but also of their other necessities like food, clothing, shelter and hygiene; it may in return acquire the old person's house, other property or money, if any.

Disease prevalence rate

Table 7 presents data on the disease prevalence rate, expressed as the number of the aged suffering from each disease per 1,000 old persons, during the two weeks before the survey. This rate is quite high, 427 among men and 357 among women in rural areas; in urban areas, 423 among men and 366 among women. In both rural and urban areas, the disease prevalence rate is higher among men than among women, doubtless reflecting differences in behaviour patterns. The rate is about the same for rural men as for urban men, and for rural as for urban women. It is somewhat surprising that the disease prevalence rate is lower in the age group 65-69 years than in the age group 60-64 years, for men and women in both rural and urban areas. But, not surprisingly, the rate is highest in the age group 70+ years, for both sexes in both rural and urban areas.

Table 7
Disease prevalence rate (per 1,000) and proportion (per 1,000) hospitalized among the aged by age, sex and place of residence

Sex	Age (Years)	Rural		Urban	
		Prevalence rate	Proportion hospitalized	Prevalence rate	Proportion hospitalized
Males	60-64	464	100	443	97
	65-69	324	103	342	102
	70+	494	102	485	100
	All ages	427	101	423	99
Females	60-64	395	90	379	91
	65-69	278	92	298	95
	70+	399	97	421	94
	All ages	357	93	366	93
Persons	60-64	436	96	416	95
	65-69	306	98	324	99
	70+	456	101	458	98
	All ages	400	98	400	97

Source: NSSO 1991:S-194

Proportions hospitalized

Table 7 also presents data on the proportions in hospital, expressed as the number of the aged admitted to a hospital per 1,000 on any day during the two weeks before the survey. There are no differences by age in the proportions hospitalized, but there are differences by sex; the proportions hospitalized are 101 among males and 93 among females in rural areas. The corresponding figures for urban areas are 99 and 93. Thus, the proportions admitted to hospital are slightly lower among women than among men. This should not be surprising because it is known that females in India are accorded a lower status than males.

Discussion

The Constitution Of India recognizes the duty of the State towards the aged. Article 41 of the Constitution enjoins the State to make effective provision within the limits of its economic capacity and development for public assistance in case of unemployment, old age, sickness,

disablement and in other cases of undeserved want. Social security, social insurance, employment and unemployment are mentioned in the Concurrent List of the Seventh Schedule of the Constitution of India. Thus, the Constitution specially vests the responsibility for social security, social insurance, and public assistance in cases of unemployment, disablement, old age, etc. with state and central governments. As a result of these commitments, many state governments have been providing old age pensions, maintaining homes for the destitute aged and providing grants to voluntary organizations maintaining such homes.

The Government of Karnataka, for example, provides a pension of Rs.75 per month to about 500,000 or about 15 per cent of people 65 and over in the state; it maintains four homes for the destitute aged, and provides grants to 43 old-age homes maintained by voluntary organizations. On an average, each old-age home has about 100 residents. But, Constitutional obligation notwithstanding, there is no specific program of the Government of India which provides services for the aged.

The analysis in this paper shows that the aged in India need special health services, but, until recently, the Government of India justified its reluctance to provide special health services for them by saying:

It is necessary to dispel the belief that old age is synonymous with ill health or disability.

Thanks to modern science and technology, most people are able to lead an active and healthy life up to the age of 70 years or more (Ministry of Social Welfare, 1987:20).

The claim is disproved beyond doubt by the findings of the 42nd Round of the National Sample Survey conducted by the NSSO and analysed here. The aged were expected to use whatever health services were offered by the existing health system; however, the Government of India was aware of its inability to provide special health services for the aged.

Health care of the elderly would best be met through the normal health infrastructure which is being progressively strengthened, particularly to reach the underprivileged sections of society. Exclusive public health services for the elderly may be difficult at the present stage of development (Ministry of Social Welfare 1987:20).

However, the Government of India has recently started a scheme of assistance to voluntary organizations which organize programs relating to the aged. The objective of the scheme is to provide physical, social, psychological and economic support for those aged 60+ years with a view to helping them to continue to be usefully active members of the community (Ministry of Social Welfare 1994:2). The programs include foster care-adoption services, mobile medical services, day care, old-age homes, and non-institutional services. The conditions stipulated for voluntary organizations to qualify for grants from the Government of India are stringent, and the number of such organizations receiving grants, except for old-age homes, appears to be very small. The program of mobile medical services for the aged deserves a detailed explanation.

Under this program, voluntary organizations are to provide services for medical consultations and treatment of old people. Since it is difficult for families to take the aged to distant hospitals, the need for assistance for geriatric disabilities is more acute among the poor. Grants will be provided to voluntary organizations which possess experience and expertise in providing mobile medical services for the aged in rural and urban slums.

The meagre financial outlay approved by the Ministry of Social Welfare for the setting up and maintenance of a mobile 'medicare' unit for the elderly is as follows: honorarium to a doctor at the rate of Rs.150 (about US \$4.70) per camp up to a maximum of eight camps in a month, to examine in each camp, 15-20 old persons; monthly salaries of Rs.900 to a combined

health worker-social worker-nurse, Rs.600 to a part-time registered pharmacist, Rs.900 to the organizer, and Rs.600 to a helper; an amount of Rs.15 for medicines, including charges for pathological tests, per old person per month; Rs.500 per month for van fuel and maintenance; and contingency payments of Rs.500 per month.

For each mobile 'medicare' unit, the contribution of the Ministry of Social Welfare will be 90 per cent of the total approved cost and the voluntary organization will have to meet the remaining 10 per cent. If a unit is working in a tribal or a hilly area, the Ministry's contribution will be 95 per cent. It is hard to obtain information on the number of such units operating, but it is safe to conclude that their number is far short of requirements.

In his budget speech in Parliament on 15 March 1995, the Finance Minister of India announced a National Social Assistance Scheme (NSAS) comprising a number of programs for the weaker sections of society. One of them envisages softening the hardships of old age by providing a national minimum old age pension of Rs.75 per month to people above 65 years of age who are below the poverty line. Many state governments are already implementing the programs, including the pension program, so the NSAS can 'ride piggyback' on them. Moreover, the minimum age of 65 years announced by the Finance Minister to qualify for the pension is at variance with the minimum age of 60 years stipulated by the Ministry of Social Welfare. There is a need to reduce the qualifying age for old age pensions to 60 years and to increase the pension substantially to, say, Rs.300 per month.

The policies are likely to be implemented on a continuing basis, but a few issues need to be resolved and the financial burden shared by the state and federal governments. Both state and federal governments should agree on a minimum age of 60 years for old age pensions and free health care. While state governments adopt destitution as the criterion for the old age pension, the federal government adopts poverty as the criterion for free health care. Both should adopt one criterion for the aged, preferably poverty, for pensions and free health care. Health is generally a state responsibility, but certain components of health care are financed jointly by the state and federal governments. In the case of the aged, state governments may continue to provide pensions, while the federal government may support free health care under the program of mobile medical services.

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Health transition research in the control of morbidity and mortality from Acute Respiratory Infection



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Abstract

The essence of health transition research is its multidisciplinary character and openness to broad theory. Theories of health transition provide the context in which classic epidemiological studies can, most effectively, contribute to population health improvement. Acute respiratory infections are a leading cause of morbidity in all countries, and a major cause of premature death in countries where mortality is high. The international ARI control program in childhood sponsored by the World Health Organization is built on conventional biomedical foundations.

Health systems in Australia and Pakistan continue to be driven by this conventional model which has contributed to changes in mortality but probably not exclusively. A health transition approach forces us to step back, and place the gains of the biomedical model in a social and historical perspective. Using that perspective to move public health policy forward in the modern nation state requires adventurous lateral thinking. We review here the problem of acute respiratory infections in Australian and Pakistani children. In Australia, we focus on the large differences in respiratory infection severity and outcomes between Aboriginal children and Caucasians. We also draw attention to our current ignorance on what differentiates children who are prone to respiratory infections from those who are not. In Pakistan, we highlight the problem of refocusing a health care system that is already seriously underfunded for the biomedical task. A major challenge for social scientists is to become involved more directly in the medical care system and devise health care interventions that can address social inequities, and can provide a better integration between social and biomedical views of the world.

The increasing involvement of social scientists in health care systems around the world is evidence that the social, cultural and behavioural issues are gaining greater recognition in health care practice. Jack Caldwell's seminal contribution on the role of female literacy and autonomy in demographic change has been reflected in the recommendations of the World Bank's 1993 report *Investing in Health*.

In this paper we contrast the insights, processes and application of modern biomedical research and the newly emerging area of health transition research, and argue for greater integration across the two paradigms. Whereas biomedical research has become more and more reductionist in its approach to the explanation of disease, health transition research goes 'system wide' seeking its explanations in social movements and cultural and behavioural mores. Epidemiology provides a set of tools which can be used to explore the distribution and determinants of disease in human populations. Conventionally, epidemiologists have been drawn from the biomedical paradigm and they see disease predominantly in reductionist terms. Their task is to relate causal exposures to disease outcomes, and the inferences they draw about causality form the basis on which public health interventions are developed. Increasingly however, as epidemiologists broaden their frames of reference to whole nation

states and the differences in cause-specific morbidity and mortality that are evident across cultures, they are being forced to acknowledge the poverty of an approach that is exclusively reductionist. There is need to elongate the causal chain to encompass broader social processes. It turns out that variables which represent socio-economic class are emerging as the most important explanatory variables for a wide range of health outcomes in many countries. This has led to growing pressures from social scientists to focus on the socio-economic variables rather than biomedical parameters. We argue here that both kinds of insights are vital and complementary, and we ask: how will the broadening insights which health transition researchers can provide, translate into world health improvement? As two medical epidemiologists who have been heavily influenced by Caldwell's work (Douglas 1991), we describe a problem which has major public health consequences both for Australia and Pakistan, and ask 'How can disease and death rates from acute respiratory infection in childhood be changed by health transition research in the future?'

These infections are a leading cause of medical consultation and hospital admission in childhood, and are the reason for huge sales of over-the-counter and prescribed drugs. The average child worldwide experiences five to eight infections per year in the first years of life and at least three million children die annually in the developing world from the serious consequences of these infections (Pio, Leowski and Ten Dam 1984; Leowski 1986).

The biomedical view of the problem of ARI in childhood

A large number of infecting agents are involved. They include viruses, bacteria and a range of parasitic agents. While death rates from these infections have declined profoundly in countries which have passed through the health transition, primary attack rates are not greatly different between developed and developing countries. As a consequence of intense biomedical research efforts there are a number of effective vaccines and a large range of antibiotic agents for prevention and therapy. Incidence rates of upper respiratory disease are quite similar in the First and Third Worlds, and viruses are considered to be the principal initiating agents. On the other hand, acute episodes of lower respiratory illness occur ten to fifty times more frequently in developing countries where the assumption is that susceptible individuals become superinfected by bacteria (Pio et al. 1984).

Seventy to eighty per cent of ARI-related deaths are caused by pneumonia. Viral agents which cause most acute upper respiratory illness probably pave the way for invasion of the lower respiratory tract by bacterial organisms which are present in the upper tract of most children, perhaps in greater profusion in circumstances of poor hygiene and nutrition. Most childhood pneumonias are caused by two bacteria, *Haemophilus influenzae* and *Streptococcus pneumoniae*, and this is true especially where ARI mortality is high (Pio et al. 1984).

Risk factors

Considerable research effort in both developing and developed countries has gone into the attempt to define those children who are at greatest risk of developing lower respiratory infection. It is clear that malnutrition is a central issue. Also, smoke in the home, whether derived from cigarettes or from combustion of biomass fuels, appears to be associated with higher pneumonia incidence (Pandey et al. 1989; Armstrong and Campbell 1991). Low rates of breastfeeding, low birth weights, and mothers in lower socio-economic groupings relate to higher rates of lower respiratory infection (D'Souza forthcoming).

The International ARI Control Program

The availability of effective antibiotic drugs offers a biomedical response to this problem and has resulted in the development of ARI control programs around the world which seek to ensure that mothers will take children to health clinics for care, and that health workers will prescribe antibiotics for those children most likely to be suffering from pneumonia (WHO 1994).

The underlying assumption is that antibiotics have contributed appreciably to the decline in First World ARI childhood mortality and that a major reduction in child mortality could result in the Third World from a rational application of simple clinical guidelines to antibiotic prescription. An international program has been promoted by the World Health Organization and UNICEF around three central interventions: the appropriate use of currently available vaccines against measles, pertussis and diphtheria as part of the expanded program of immunization; education of mothers and health workers in the recognition of signs that a respiratory infection has extended from the upper to the lower respiratory tract; and the use of standardized clinical guidelines to assist health workers in the prescription of antibiotics which can cut short life-threatening pneumonia caused by the two most common lower respiratory tract pathogenic bacteria.

Field tests of this approach to ARI control were instituted in a number of developing countries (Bang et al. 1990; Pandey et al. 1991; Fauveau et al. 1992) and a recent meta-analysis of this experience evaluated in a series of quasi-experimental trials has concluded that the combined approach is associated with reduced loss of life (Sazawal and Black 1992). But this approach has been impeded by growing antibiotic resistance, difficulties of antibiotic supply in poor countries, logistic difficulties in the delivery of vaccines to eligible children, and the relatively high cost and complexity of treatment as a life-saving intervention in childhood.

Pakistan

In Pakistan where the costs of antibiotics are a major disincentive to their use and where health workers are not consistently available, high ARI mortality rates persist.

In urban slums ARI is the second leading cause of death and these deaths usually occur before the age of two years. Mortality is much greater in infants than among older children. One of the associated causes of death is malnutrition. There is seasonal variation for ARI which is highest in the winter months from November to March (Community Health Sciences Department 1992). In Pakistan and many other cultures, infants are not taken out of the house even when ill for fear of exposing them to further risks (Bang et al. 1990). A national survey in 1990-1991 showed that one in six children had suffered from the symptoms of ARI — cough accompanied by rapid breathing — during the two weeks preceding the survey. Two-thirds of the children who suffered ARI symptoms were taken to a health facility or health provider for treatment. Children most likely to have untreated symptoms were those four years of age, children highest in the birth order, children in the Sindh province, and those whose mothers had no education (Pakistan DHS 1992).

The health care delivery system in Pakistan is strained by the country's high population growth rate. The health system ranges through religious and faith healers, traditional healers, homoeopathic dispensaries, modern hospitals and specialized clinics. The conventional medical systems focus largely on the curative aspects of disease. The government is encouraging the use of Western medicine, community health workers and doctors, and large specialized hospitals are being established in the cities.

Most of the health providers, doctors, nurses and dispensers, are based in city hospitals. Rural people are left with little or no treatment or have to resort to traditional healers. Currently 70 per cent of the population live in rural areas; they are served by Basic Health Units (BHU) which refer cases to the District Hospitals. There are problems with

accessibility, quality, staffing and equipment of the health services, which are more acute in rural areas.

The treatment of ARI leaves much to be desired. ARI is often not recognized, or if recognized, not treated correctly. Poly-pharmacy is a common occurrence and irrational drug use is prevalent. In urban slums self-medication is common and mothers tend to change healers if they find no improvement in the child's condition. Pneumonia signs may be overlooked or disregarded in a female child. In Pakistan's urban areas, especially in slums, many health practitioners are quacks. Most of them reinforce the harmful practice of resorting to poly-pharmacy for a quick 'cure'. They dispense only a day's medication and often poor mothers will stretch this out to two days, and when the child does not improve they change the healer. They may then resort to traditional healers. Patients who do not get well by such means may then turn to a religious healer.

Social and epidemiological research has identified a number of risk factors for poor outcomes of ARI in both rural and urban settings (Leowski 1986; van Ginneken 1990; Kundi et al. 1993; Hussain et al. n.d.). The risk factors include inadequate health services; low levels of health consciousness; ineffective case management by traditional healers and allopathic providers; irregular drug supplies; low nutritional levels; low birth weight; crowded living quarters (8-12 in a single room) for both cooking and sleeping; incompletely immunized children; dusty environment; biomass fuel for cooking and warmth; inadequate ventilation and environmental sanitation; lack of protected drinking water; and general poor hygiene. Fortunately breastfeeding is widespread.

There is a Federal ARI cell established by the Ministry of Health which is promoting the National ARI Control Program using the WHO (1990) recommendation for ARI control. The objectives of this program are to reduce mortality from ARI, in particular pneumonia in children under five years of age, and to reduce the inappropriate use of antibiotics and other drugs for the treatment of ARI in children. The strategy used is standard ARI case management of children under five years of age: high coverage of measles, pertussis and diphtheria immunization, promotion of breastfeeding and good nutritional practices. Immunization coverage has been quite good through the Expanded Immunization Program. The coverage for DPT immunization is around 78 per cent and measles around 76 per cent (Grant 1994).

The success of this national strategy will depend upon an educated, well supplied and disciplined health and medical workforce, and a major health education program directed towards mothers of young children. Major changes in traditional behaviour will be required to address the objectives of the national program.

Australia

In Australia, where the cost of antibiotic therapy is not a serious disincentive to the use of multiple antibiotic regimes, and where access to medical care is not problematic (Douglas 1984), mortality from pneumonia in childhood is now exceedingly low but morbidity from pneumonia remains a serious problem in Aboriginal communities (Douglas et al. 1986). It also deserves re-emphasis that the problem of upper respiratory infections continues in Australia as a major burden of morbidity and use of the health care system, and that biomedical approaches to prevention of upper tract infections have been conspicuously unsuccessful.

The decline in mortality has coincided with the widespread availability of antibiotic drugs through an increasingly equitable national health care system that is premised heavily on the biomedical model of disease. The fall in mortality has also paralleled rising community affluence, home ownership, education, female autonomy, improved community nutrition and

environmental health, decreased crowding, decreased parental smoking, and improved breastfeeding practices.

Australian mothers who have kept prospective diaries of their children's respiratory systems in the first two years of life have recorded, on average, six episodes of respiratory symptoms annually. While some of these episodes last for no more than two or three days of mild sniffles, others are associated with prolonged cough and wheeze (Douglas et al. 1994). The role of viruses and other micro-organisms in this burden is incompletely defined. Viruses are isolated from these children about 40 or 50 per cent of the time and it may be that other episodes are linked to agents which have not been identified by modern virological or microbiological techniques (Douglas et al. 1990).

The burden of respiratory morbidity is unevenly spread amongst Australian children. While some children seldom experience respiratory symptoms others have multiple episodes and prolonged symptoms when an episode occurs. A recent epidemiologic study, in which we attempted to develop a predictive regression model based on known biological and social and environmental parameters, only explained about 10 per cent of the variance in respiratory symptoms in the first two years of life.

Australian Aboriginal children have a very different experience of acute respiratory infections from non-Aboriginal children. They are more likely to experience lower respiratory tract infections and to be hospitalized for these infections. Nasopharyngeal carriage rates of pathogenic bacteria tend to be higher in Aboriginal children and they experience a particularly aggressive form of middle ear infection which results in rupture of the eardrum and chronic discharge from the middle ear. This pattern of respiratory morbidity is more like that experienced by children in developing countries than children in Australia's more affluent suburbs. The reasons for these differences in pattern are almost certainly social, environmental and economic. As a group, Aboriginal children tend to be socially, nutritionally and environmentally deprived. Their access to primary care services has been poor, and Aboriginal communities tend to be socially disrupted, dispirited and lacking in self esteem.

Thus, the challenge of acute respiratory infection control in childhood in Australia is one of uncontrolled morbidity and a socio-economic difference in severity. It is possible that if orthodox medical services were improved, irrespective of the social and environmental inequities that have existed now for over 200 years between black and white Australians, respiratory morbidity would become less serious. But such a solitary solution to the problem of Aboriginal respiratory illness is not an acceptable one. There are now strong social pressures and a national commitment to improve health care in the context of minimizing social disadvantage.

Also, if we are to improve our understanding of childhood respiratory disease in the white middle-class suburbs of Australia, where it still causes massive uncontrolled morbidity and health-care expenditures, we need to tease out the relative contributions of antidotal treatment (such as that championed by the WHO international program) from the role of the physical and social environment. There is a great need to improve our understanding of the social and environmental determinants of the incidence of respiratory infections as well as their severity.

Prevention versus cure

Worldwide, health systems are in a 'trade-off' situation in which expenditures on preventive measures, for example vaccines, are balanced against the costs of treating established illness. Both activities are seen as important, but prevention often loses out to the imperatives of managing the 'here and now' of acutely ill and dying patients. This contrasts vividly with the imperceptibility of disease that has been prevented. We have not seriously explored the proper integration of social science into either our preventive or therapeutic drugs and services.

Whereas the biomedical paradigm seeks improved diagnoses, drugs and vaccines and their optimal distribution and delivery, a health transition approach forces us to put these developments into a social and environmental perspective.

With respect to Australian Aboriginal ARI we need to ask about the relative costs and benefits of mass immunization, and improved access to treatment, on the one hand, with all the cultural and behavioural shifts that implies, against the possible impact on disease severity and disease incidence which improved wealth or physical environment could produce. These considerations are equally pertinent to the development of policy for health care in countries like Pakistan. Indeed, where per capita expenditures on health are smaller, the consequences of misallocation to ineffective interventions are greater.

The operation of health care systems

Vast expenditures are now committed to the operation of health care systems in both developing and developed countries. Administrators now demand evaluation, efficacy and outcomes as new technologies aimed at promoting community health proliferate.

This is the environment in which social scientists must compete if they are to drive health improvement. The task is not a trivial one, as the evaluative models which drive vaccine and drug licenture, and promote the uptake of new technology, are both elegant and convincing.

Time frames for health transition outcomes are much longer than those of randomized control trials, and causal inference is much more difficult. How can one compare a program of adult literacy in a Pakistani slum with a program aimed at improving uptake of antibiotics, in their relative impacts on child mortality? How will we compare the relative costs and benefits of vaccination against a common respiratory virus such as respiratory syncytial virus with a program aimed at improving self esteem of Aboriginal mothers?

How much social and cultural research should precede educational programs aimed at enhancing the capacity of mothers to identify when an infection of the respiratory tract has become life threatening? What is the family doctor's role in managing the burden of respiratory disease in his or her local community?

If health transition theory is truly to drive health improvement, sophisticated evaluative methods will need to be introduced into health care systems, that can enable cross-disciplinary communication. There is a growing recognition in the biomedical communities around the world of the need to marry biomedical insights with social science. Effecting the marriage will be no simple task. A good starting point will be for social scientists to bring their insights to problems which already trouble the biomedical policy-makers. For example, do differences in perceived prognoses influence household investment of scarce resources in medicines or practitioner visits? What signs and symptoms indicate to a mother that her child is sick? What signs and symptoms are associated in the mother's mind with the supernatural and the need for supernatural treatments? How is health-seeking behaviour influenced by household composition, female employment, education, etc? What leads to mothers being primary decision-makers while in other cultures decisions are taken primarily by grandparents or fathers? How do parental and practitioner expectations differ with respect to the desirable outcome of clinical consultations? What are the determinants of self-medication in developing-country communities and what kinds of intervention make a difference to these perceptions or attitudes?

More radical social views of health

The examples given above offer mechanisms for a greater marriage between social and biomedical sciences. But they will not satisfy the potential of health transition research in improving world health. We do not believe it will be a matter of *either* biomedical *or* social

interventions making a difference but would hypothesize that well evaluated experiments which address both areas are likely to be multiplicative in their effects on health. Social scientists need to become properly embedded in the health system infrastructure around the world, but they also need to be catalysts for broad social change that extends beyond the health system.

A more adventurous commitment to health transition theory involves us in considerations of literacy, income supplementation, housing modification, initiatives to improve self esteem and empowerment, changes in attitudes to sex, marriage, violence, use of leisure time and communication between individuals. These attributes go to the heart of culture and social behaviour, and of course go well beyond the health care system as we know it. There is growing evidence that failure to address these broader social and cultural variables is simply tinkering at the edges of health and of human survival. Whatever the success of the biomedical model (and it is difficult to be confident how much of our change in mortality is attributable to it) future developments in health are clearly going to depend on us addressing these broad social determinants of inequality in health outcomes. To structurally address these problems takes us well outside the health portfolios of governments around the world, and inevitably involves an intersectoral approach to health and welfare.

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What Yugoslavia means: progress, nationalism, and health*



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Abstract

Theories of modernization have assumed that the creation of nation-states involved the breakdown of parochial ethnic boundaries and increasing secularism, all of which resulted in a demographic transition from high to low fertility and mortality. Recent experiences suggests, however, that in some circumstances nation-states may be highly unstable as ethnic minorities assert their rights to self-determination. Under such conditions, converging patterns of mortality may begin to diverge as growing inequalities appear between newly independent region of once unified states. The recent history of Yugoslavia is described to provide an example of how this process might occur and what the results might be.

Turning and turning in the widening gyre
The falcon cannot hear the falconer;
Things fall apart; the centre cannot hold;
Mere anarchy is loosed upon the world,
The blood-dimmed tide is loosed, and everywhere
The ceremony of innocence is drowned;
The best lack all conviction, while the worst
Are full of passionate intensity.
W.B. Yeats, The Second Coming

Theories of the demographic, epidemiologic, and health transitions are based upon assumptions about the nature of both modernization and nation-states inherited from the nineteenth century. Contemporary events, however, are calling into question the timelessness of those assumptions. In 1992 there were active self-determination movements to achieve full sovereignty or some lesser degree of minority rights in more than sixty countries — one third of the total roster of nations (Cutler 1992:xi). I use the recent history of Yugoslavia to suggest some of the reasons why this state of affairs has come about and what some of the implications are for morbidity and mortality patterns in particular and for the way we should think about epidemiologic and health transitions more generally.

*This paper is based upon a talk given at the John C. Caldwell Seminar, The Continuing Demographic Transition, Australian Academy of Science, Canberra, 14-17 August, 1995. I am grateful to Dr. Arpad Barath for making available survey data from Zagreb; to Dr. Goran Sevo for material from Belgrade; to Prof. K. Ruben Gabriel for statistical help; and to Edith Efron and Professors Donald Denoon, Stanley Engerman, and F.B. Smith for helpful comments.

Modernization and transitions

The two dominant post-war theories of development and modernization have been Marxism and functionalism. While there are important differences between them, they are agreed that the process of development leads to the blurring of ethnic and national boundaries (Jalali and Lipset 1992-93). According to the functionalists, the process of modernization resulted in the convergence of many diverse traditional societies towards modern industrial society that was broadly similar every place it was found. Modernization was said to be observable at both the institutional and individual levels. Inkeles and Smith (1974:16) summarized the institutional characteristics of modern societies as described by several scholars as follows:

Economic modernization included intense application of scientific technology and inanimate sources of energy, high specialization of labor and interdependence of impersonal markets, large-scale financing and concentration of economic decision making, and rising levels of material well-being.

They summarize the characteristics of political modernization as: the replacement of a large number of traditional, religious, familial, and ethnic political authorities by a single, secular, national political authority; the emergence of new political functions — legal, military, administrative, and scientific — which must be managed by new administrative hierarchies chosen on the basis of achievement rather than ascription; and increased participation in politics by social groups throughout the society, along with the development of new institutions such as political parties and interest groups to organize this participation. And accompanying economic and political modernization are characteristic changes in demographic and epidemiologic patterns: a decline in mortality followed at varying intervals by declining fertility; a change from infectious diseases afflicting mainly children to non-infectious diseases afflicting mainly adults; characteristic changes in the age structure, and so on (Moore 1963:100; Omran 1971).

At the individual level, too, common features were found by Inkeles and Smith to be significant in differentiating modern from traditional men. They wrote of the modern man, for instance:

As an informed participant citizen, the modern man identifies with the newer, larger entities of region and state, and takes an interest in public affairs, national and international as well as local, keeps himself informed about major events in the news, and votes or otherwise takes some part in the political process.... His independence of traditional sources of authority is manifested in public issues by his following the advice of public officials or trade-union leaders rather than priests and village elders (Inkeles and Smith 1974:290-291).

Indeed, Moore wrote that a 'High degree of national integration or, in short, *nationalism*' is crucial to modernization. He continued: 'Nationalism provides a kind of non-rational focus of identification and rationale for extensive disruption of the traditional order' (Moore 1963:94).

These ideas bear an uncanny resemblance to their nineteenth century ancestors (Nisbet 1969), as well they should, for it was in the nineteenth century that nation-states emerged along with the legitimating ideology of nationalism (loyalty to a secular state) in their present form. Writing of the nineteenth century, Hobsbawm has observed that a nation-state must be

capable of developing a viable economy, technology, state organization and military force.... It was to be, in fact, the 'natural' unit of the development of the modern, liberal, progressive and de facto bourgeois society. 'Unification' as much as 'independence' was its principle... [There is] a fundamental difference between the movement to found nation-states and 'nationalism.' The one was a programme to construct a political artifact claiming to be based on the other (Hobsbawm 1975:86, 88).

That is to say, the nation-state and nationalism were thought to be progressive precisely because they freed men from the parochial bonds of extended kin groups, from small communities and narrow ethnic loyalties, and from ignorance and prejudice. Such paired concepts as *Gemeinschaft* and *Gesellschaft*, status and contract, and traditional and legal-rational authority were our intellectual forebears' attempts to generalize the transition from traditional to modern that the nation state and its overseas extension, imperialism, represented (Anderson 1991).

In the name of progress nation-states absorbed small populations of 'backward' peoples, often denying their legitimacy as distinct peoples, relegating them to the status of 'provincial idiosyncrasy', or simply denying their existence (Hobsbawm 1975:86-87). The paradox of nationalism was thus 'that in forming its own nation it automatically created the counter-nationalism of those whom it now forced into the choice between assimilation and inferiority' (Hobsbawm 1975:97). That counter-nationalism was to emerge not only in the colonies overseas but among the 'backward' peoples of Europe itself: among the Basques, the Corsicans, the Irish, and among various groups of South Slavs who were to be joined together in what was to become Yugoslavia, and separated from each other in what has now become the former Yugoslavia.

It is in the context of the growth and integration of nation-states that much Western social science has grown, and with it thinking about modernization and the convergence of diverse societies towards similar economic, political, demographic and epidemiologic regimes. In recent years, however, as conflicts over ethnic self-determination have become increasingly obvious, various attempts have been made to account for them by modifying modernization theory (e.g. Newman 1991). In the population sciences, too, authors writing about the health transition have been careful to say that linear improvement is not inevitable. Indeed, in a recent volume several contributors write that 'counter-transitions' may occur and that inequalities in health may increase rather than decrease (Murray and Chen 1994; Frenk et al. 1994).

It is this change in our shared assumptions about the inevitability of progress, particularly progress in health, that I should like to consider in this paper. It is the counter-nationalisms that were provoked both in Europe and overseas which seem to be leading in our time not to convergence but to divergence in the health and well-being of peoples. It is the very emergence of global society that is provoking counter-national movements, in part by weakening nation-states. And these developments should encourage us to continue to re-think many of the assumptions upon which the social and population sciences are based.

Nation-states have been increasingly integrated into supra-national federations such as NAFTA and NATO, as well as linked by non-governmental and quasi-governmental ties: through the integration of national markets within regional and world trade networks; through television broadcasts visible round the world; by the Internet; by the movement of money across international boundaries with the speed of light; and by countless global organizations, the Red Cross, the World Bank, the United Nations, Amnesty International, and multinational corporations. Barber (1992:59) has written:

The Enlightenment dream of a universal rational society has to a remarkable degree been realized — but in a form that is... radically incomplete, for the movement toward McWorld is in competition with forces of global breakdown, national dissolution, and centrifugal corruption.

The centrifugal forces are not nations:

They are cultures, not countries; parts, not wholes; sects, not religions; rebellious factions and dissenting minorities at war not just with globalism but with the traditional nation-state... peoples without countries, inhabiting nations not their own, seeking smaller worlds

within borders that will seal them off from modernity... The mood is that of Jihad: war not as an instrument of policy but as an emblem of identity, an expression of community, an end in itself (Barber 1992:59-60).

It is this counter-nationalism, itself a reaction to the legacy of nineteenth and twentieth century imperialism and nation-state creation within Europe as well as overseas, which we are seeing explode in various parts of the world.

The consequences of this explosion ramify widely, affecting international relations, legal and political systems, national economies, education, language, and intimate relationships such as those between spouses of different ethnic or national origins. I shall take Yugoslavia as a case study and consider the health-related consequences of the explosion, not simply because health is what I am trained to talk about, not simply because the audience for this paper is made up of demographers and public health workers, and not because changing health status is necessarily the most significant consequence of these developments, but because the health of a population is a measure of well being every bit as important as the gross national product per capita. It is the expression of a broad array of forces and thus offers a unique vantage point from which to view both large and small social changes.

I have provided a good deal of detail on Yugoslavia's recent history, more than some readers may think useful. I have done so because I want to illustrate how modernization theory has failed to account for what has occurred there, and to suggest that in the future as we seek to explain the morbidity and mortality of populations we may need to look elsewhere for theoretical insights. Both the functionalist and the Marxist variants of modernization theory would have predicted continuing improvement in Yugoslavia, reflected not simply in generally increasing income and literacy but also in the improvement and convergence of mortality rates and other measures of health. I wish to argue that the collapse of Yugoslavia is likely to see the divergence of many of these measures, and that Yugoslavia is not unique in this regard. To the contrary, the break-up of federations and devolution within intact nations may have similar effects elsewhere. Just as the assumptions on which the social sciences of the twentieth century have rested derive largely from the nineteenth century experience of nationalism, progress, and Westernization, so might the social sciences of the twenty first century come to rest on assumptions derived from the late twentieth century experience, exemplified by Yugoslavia, of counter-nationalism and devolution.

The former Yugoslavia

A brief history

The country known as Yugoslavia was created by the Treaty of Versailles, the product, as Denitch (1994:22) has written, of 'long, although inconsistent, nationalist struggles against two multinational empires', the Ottoman and the Austro-Hungarian. Throughout the nineteenth century Croatia and Slovenia had been part of the Austro-Hungarian Empire. Serbia had gradually achieved independence from the Ottomans over the course of the nineteenth century. Bosnia, which had also been an Ottoman possession, was turned over to the Austro-Hungarian Empire as a result of the Treaty of Berlin in 1878.

The Ottoman Empire, widely known as the 'sick man of Europe', had by the end of the century largely withdrawn from the Balkan Peninsula and remained in control of only Thrace and Macedonia. In 1912 the Serbs, Bulgarians, Montenegrins, and Greeks joined to drive the Turks from those remaining lands; this was achieved in the First Balkan War in 1912. Shortly thereafter the victors fell to quarrelling among themselves, and in 1913 the Second Balkan War erupted, with the major fighting occurring between the Serbs and the Bulgarians, from

which the Serbs emerged as the victors. Observers at the time were appalled by the cruelty of the war, not simply at the neglect of civilians and prisoners but at the barbarity of the torture and destruction that was inflicted (Carnegie Endowment 1993).

The nationalist enthusiasms of which these two wars were a manifestation were rife throughout the Balkans, and a year later, in June 1914, led to the assassination of the Hapsburg Archduke Franz Ferdinand and his wife in Sarajevo by nationalist Bosnian Serbs seeking union of Bosnia with Serbia. The Austro-Hungarians held Serbia responsible and war erupted, which for the Serbs became a war to liberate all their South Slav brethren: Croats, Slovenes, and Serbs still under the domination of the Austro-Hungarian Empire (Tomasevich 1955:216-217). The result, after horrific bloodshed, was the creation by the victorious allies of the Kingdom of the Serbs, Croats, and Slovenes.

All the regions that made up the new nation were for the most part agricultural. What industrial and commercial development had occurred was mainly in Croatia and Slovenia, which had been part of the Austro-Hungarian Empire. When the new country was created by the Treaty of Versailles in 1918, the Croats and Slovenes went from being among the least developed parts of the empire to the most developed part of an undeveloped country. Rather than being able to trade in a large area without customs restrictions, they were now the commercial centres of a small, poor country whose political centre was located in Belgrade and dominated by Serbs (Trouton 1952; Bicanic 1973; Kunitz 1979; Denitch 1994). It is to the restriction of Croatian and Slovenian trading and commercial possibilities and to autarchic Serbian policies that much of the hostility between these republics right up to 1991 may be attributed.

The country remained largely undeveloped throughout the inter-war years. Seventy-seven per cent of the population were peasants. Illiteracy rates of those over ten ranged between 83.8 per cent in Macedonia and 8.8 in Slovenia, with the national figure being 51.5 per cent in 1921 (Tomasevich 1955:198). Mortality and fertility were both high, epidemics were common, and the government was ineffective in providing preventive and curative health services as well as needed infrastructure. High taxes and declining agricultural prices during the depression years of the 1930s may have contributed to the peasants' hostility to the government and to their support for the Partisans during World War II, which was as much a civil war as a war against the German invaders.

That the Yugoslavs had fought their own war of liberation and had had their own Communist revolution gave them a certain degree of independence in dealing with the Soviet Union and other Communist nations. In particular, the Yugoslav leadership wished to develop Yugoslav industry rather than be dependent entirely upon the Soviet Union for manufactured goods. Conflict with the Soviet Union over this and other issues resulted in expulsion from the Comintern in 1947 and increasing economic and political isolation (Johnson 1972).

As a result, Yugoslavs became increasingly critical first of Soviet foreign policy and then of domestic policy, what they called *etatism*; that is, centralized, bureaucratized government planning and control. In response to the threat of invasion by the Soviet Union, and in order to maintain the allegiance of the people, most of whom were non-Communists, a new form of socialism, called *self-management*, was developed, which involved increasing decentralization and greater integration of workers in decision-making in the enterprises in which they worked (Denitch 1976; Supek 1970). There was growing openness toward, and dependence upon, the West as trade with the Eastern bloc declined. This took several forms including foreign aid, foreign investment in Yugoslav enterprises, an increasingly market-oriented economy, and, increasingly through the 1970s, loans from commercial lenders.

For reasons suggested previously, the conflict between Serbia and Croatia was the most persistent and severe throughout the post-war years. Croats were thus among those most in

favour of the greater liberalization and decentralization pursued through the 1960s and early 1970s. But they were not alone:

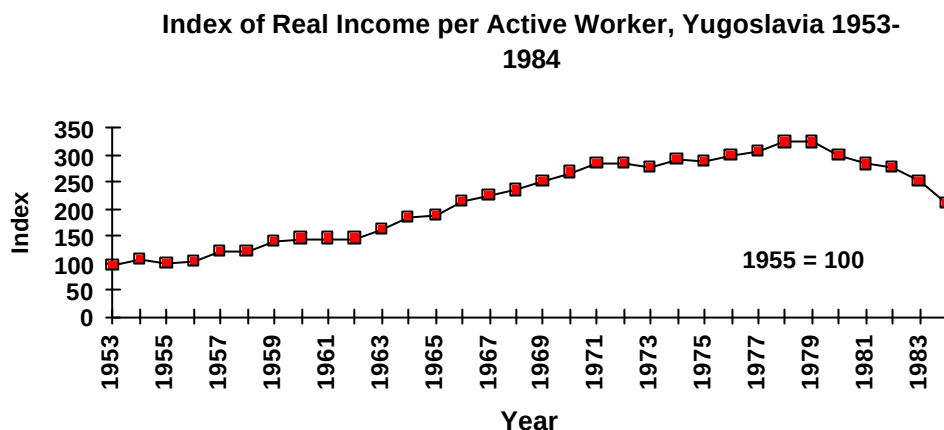
There were those managers, 'technocrats' and local political magnates with reasons to dislike central redistribution and those spokesmen for ethnic groups with anxieties about Serbian domination... There were... the Economic Chambers [of the federal and republican assemblies] as the chartered voices of socialist enterprises with an accumulation of grudges against the existing system. There was the Trade Union Federation defending what it claimed were the interests of all workers but were primarily the interests of workers (and managers) in profitable and potentially profitable enterprises. There were also republican political bureaucracies, exploiting paralytic dissensions at the Party to build their own empires....And there were the ideological liberals of Yugoslav communism (Rusinow 1977:159).

On the other side were the so-called party conservatives who believed in central planning, and representatives of underdeveloped republics and provinces who were afraid they would lose the benefits of the central redistribution of resources. They began to regain the ascendancy when, as a result of student strikes in Zagreb in November, 1971 and a coup by Tito against the Croatian leadership, a new constitution was passed in 1974. It signalled a return to more central control and an increasingly important role for the League of Communists of Yugoslavia, which had lost its place as a unifying and controlling force following the reforms of the early 1960s.

Despite attempts by the central government in Belgrade to redistribute wealth from the developed to the less developed regions of the country, disparities persisted right through the 1970s and into the 1980s. For example, school attendance and literacy increased all across the country, but by 1987 there were still major differences, from 0.8 per cent illiteracy in Slovenia to 17.6 per cent in Kosovo (Mastilica 1990). Similarly, there continued to be significant regional differences in income, in per capita expenditures on health and welfare, and in the distribution of physicians and hospital beds (Kunitz 1980).

On the other hand, unwise borrowing, growing international indebtedness, and increasing inflation during the same period led to a growing perception in the developed republics, notably Croatia and Slovenia, that at the very time the economy was worsening they were being taxed at unfairly high rates by Belgrade to pay for services and to support inefficient industrial development in the poorer republics and in the Autonomous Province of Kosovo. Figure 1 displays the index of real income per worker from 1953 to 1984. It shows that income did indeed begin to stagnate in the early 1970s (*Statistical Yearbook* 1980, 1984). There was a slight increase in the late 1970s and then a severe decline beginning in 1979 which persists to the present, although a continuous series of data was only accessible to me to 1984.

Figure 1



The economic decline which began in the late 1970s occurred elsewhere in Eastern Europe and the Balkans at the same time (Milanovic 1991) and was due to severe deficits in the balance of payments, the result of increases in the price of oil and other imported goods beginning in the early 1970s; declining competitiveness of Yugoslav exports in the world market; and increasing resort to short-term commercial loans at high interest rates. Owing to the massive current account deficit:

A stabilization program was instituted toward the end of 1979 consisting of tight monetary policy and direct controls on investment expenditures, particularly in the non-economic sector. This program was supported by a standby arrangement with the IMF, concluded in May 1980. In June 1980 the dinar was devalued by 30% against the U.S. dollar in gross terms. In addition imports were restricted to essential items.

These measures had a substantial effect on both growth and the balance of payments. Growth of material product in 1980 declined to 2.2%, a level lower than that of 1976. Imports were sharply cut while exports grew substantially. As a result the deficit on merchandise trade was reduced by \$1.2 billion. This, coupled with a modest increase in the surplus on services led to a substantial improvement in the current account deficit, to \$2.3 billion or 3.3% of GDP. The shift of resources to the external sector was made possible by a cut in fixed capital formation. In addition growth in consumption was sharply curbed primarily through a fall in real wages in the social sector. Despite this drastic slowdown inflation accelerated (World Bank 1983).

This assessment by the World Bank was made in the early 1980s. From 1970 to 1980 inflation had averaged 18.4 per cent per year. It accelerated through the 1980s, ranging between 85 and 105 per cent annually in the early 1980s, reaching 800-900 per cent by the end of the 1980s, and averaging 123 per cent annually from 1979 to 1989 (Kunitz, Simic, and Odoroff 1987; World Bank 1993; Ramet 1992:239).

It would have taken a nation built on exceedingly strong and deep foundations to withstand such rapid economic erosion. Yugoslavia was not such a nation. In addition to the legacy of inter-republic tension, it was a single party state. There was no organized opposition

party that crossed republic lines and that could unite people once the dominant party had been discredited. Moreover, in both Serbia and Croatia there were demagogic leaders whose appeal to their constituents was based on ethnic loyalties which, once unleashed, could not be controlled, even if anyone had wanted to (Denitch 1990, 1994; Glenny 1992). It is no accident that Croatia and Slovenia, the two wealthiest republics, each with a history of resentment of the central government, were the first to secede from the Yugoslav federation in 1991, thus precipitating the third Balkan war.

Mortality in the Post-World War II era

People at the extremes of the life cycle, the very young and the very old, are most vulnerable to deteriorating social and economic conditions. Evidence from Yugoslavia suggests this was true in the 1970s and 1980s before the present warfare began. Some evidence suggests that elderly non-combatants continue to be especially vulnerable outside the combat zone since the outbreak of fighting. Where fighting occurs, non-combatants of all ages seem to have been the victims.

Infant mortality

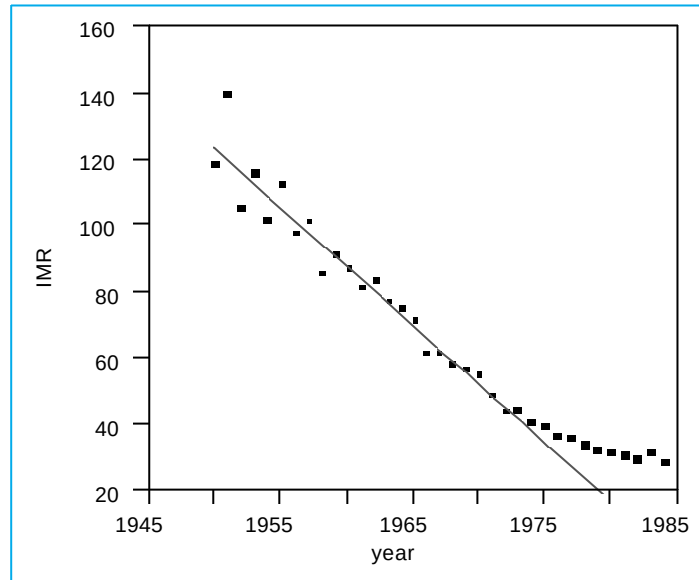
Figure 2 displays infant mortality rates from 1955 to 1984 for the entire Yugoslav population. There was a substantial drop over most of the period. Just as striking as the decline, however, is the stagnation which began some time in the early 1970s and became worse in the early 1980s.¹ The slowing rate of decline occurred at the same time as inflation was increasing and rates of improvement of real income were slowing and then reversing.

Figure 3 displays infant mortality rates for all the republics and both autonomous provinces (Kosovo and Vojvodina) between 1950 and 1984. Two points are noteworthy. First, regressions for each region (figures not shown) indicate that there was a generally similar pattern of slowing decline of infant mortality rate in each of them beginning in the 1970s, although both the decline and the slowing were earliest in Slovenia.

Second, there was a convergence of rates over the period, although the differences between the highest and lowest remained enormous. The ratios of the rates in Kosovo and Slovenia were 1.75 in 1950 and 4.0 in 1984. The absolute differences were 60.7 per 1,000 in 1950 and 47.4 in 1984. Thus, the rate of decline was greater in Slovenia than in Kosovo though the absolute difference between them did diminish. That Kosovo was increasingly Muslim and had very high fertility did nothing to diminish the resentment of people in the richer republics, who saw their money used to support a rapidly growing population that they thought would never be able to be self-supporting.

¹I do not have yearly infant mortality rates for subsequent years. There is some evidence that the rate did decline in subsequent years, from 28.9 in 1984 to 27.1 in 1986 and 21 in 1989. The 1986 figure is from Masticilica (1990:Table 2). The 1989 figure is from World Bank (1993:Table 28). I am sceptical of the validity of these later figures because after our article on infant mortality was published in 1987, cynical Yugoslav colleagues predicted that subsequent official reports would show dramatic declines. That seems to have been what happened (Kunitz et al. 1987).

Figure 2
Infant mortality rate by year, Yugoslavia 1950-82



Regression line is drawn for the years 1955-72

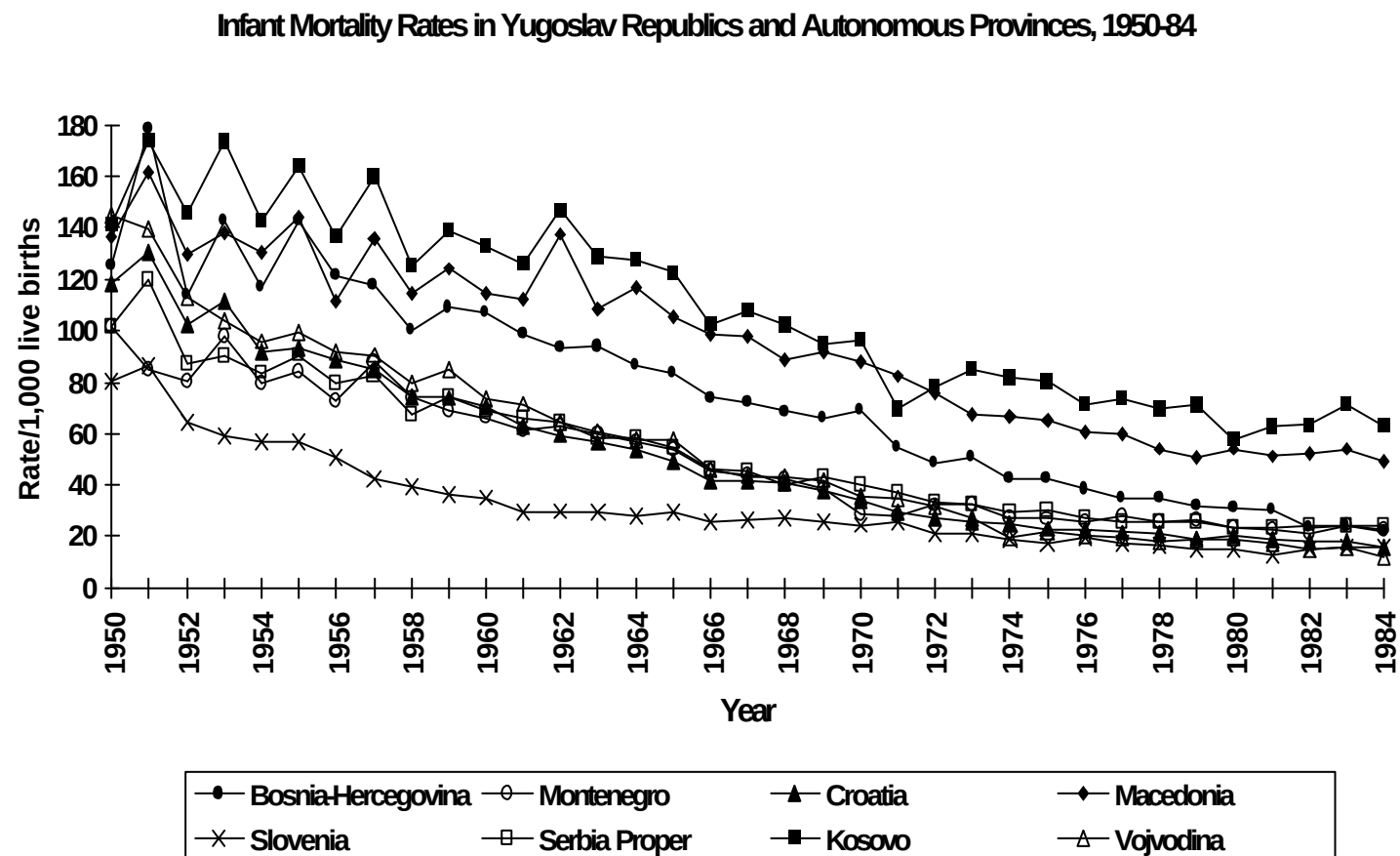
These observations suggest that while inequalities were persistent and severe, the Yugoslav principles of solidarity and reciprocity which required significant redistribution of wealth from rich to poor republics and provinces, and from rich to poor communes within republics, worked to buffer the impact of the economic crisis in the poorer populations, at least insofar as the impact of the economic crisis on infant mortality was concerned.² Redistribution of this sort, what has been called 'horizontal equalization', is an issue with which all federations must deal (Hunter 1977). In the case of Yugoslavia it caused problems that could not be overcome.

Mortality among the aged

The aged are the other age group that seems to be most susceptible to the ill effects of economic decline and environmental hazards. Mortality rates of women 80-84 increased from 129.1 per 1,000 in 1977 to 132.5 in 1981, and of men from 153.1 to 162.9. For women and men 85 and above the increases were from 191.8 to 229.1 and from 210.8 to 242.7 respectively (*Statistical Yearbook* 1984:120).

²The historic data concerning infant mortality in each republic and autonomous province are in Kunitz et al. (1987:Table 1). The same source contains data on inter- and intra-republic transfers of funds in the 1980s.

Figure 3



We may consider mortality among the aged more closely by examining data from a study of the health of the aged in several European countries which included a sample of the aged in Zagreb in 1979 (Heikkinen, Waters and Brzezinski 1983). Although the overall study was concerned with people aged 65 and above, the Zagreb investigators drew a random sample of people 45 years of age and above. In 1989, a little more than nine years later, a random sample of that original sample was drawn. Limited resources meant that a thorough search could not be made for each person in the sample. Nonetheless, the investigators achieved a success rate of 70 per cent; which is to say, they were able to either interview or ascertain the vital status of 70 per cent of the new sample they had drawn. Unfortunately, there seems to have been a selection bias at work inasmuch as the completed survey had an under-representation of men who had been 75 years and older in 1979.³

A good deal of sociological and health-related data were collected, but I am concerned with only the mortality experience of the sample. Details of the methods of analysis are presented in the Appendix. It suffices to say here that the observed mortality experience of the sample was compared with what would have been expected based upon age- and sex-specific mortality rates for the entire Yugoslav population in 1979. Unfortunately, comparable data for the city of Zagreb or for the republic of Croatia were not available. The results are shown in Figures 4 and 5. The plots show separately for each sex, and as a function of age, the actual survival proportion (+) of the survey and the corresponding probabilities (x) of surviving the 9.125 years according to the 1979 death rates (see Appendix).

Females of all ages survived the survey period slightly less frequently than expected from the 1979 death rates. The difference was largest at about age 70 when 65 per cent survived as compared with the 75 per cent expected. For males the situation was more complex. Men below the age of 65 survived considerably less frequently than expected, whereas older males (75 and above) survived more frequently. Thus, at age 60, 74 per cent of males survived as against 85 per cent expected. On the other hand, at age 80, 52 per cent survived as against 32 per cent expected. As noted previously, this observation is almost certainly the result of bias in the sampling, for the interviewers were less successful locating older male informants or their next of kin than they were locating any other age-sex group. Taking this potential bias into account, I believe these observations support the hypothesis that the economic crisis beginning in 1979 had a significantly deleterious effect on the health of adults, largely because pensioners living on fixed incomes suffer especially severely during inflationary periods.⁴

³In 1989 22.8 per cent of men who had been 75 and older in 1979 were located compared with 47.2 per cent of women.

⁴The expected survival curves are based upon age-specific mortality rates for all of Yugoslavia in 1979, not for Croatia or for the city of Zagreb. Because Croatia had lower mortality than most of the other republics, it is possible that the age specific rates at the oldest ages would have been lower had we been able to use figures from Croatia alone. If that were the case, the difference between the observed and expected survivals would have been greater than we have reported. That is to say, a higher proportion would have been expected to survive in Croatia than what we calculated from the rates of the entire Yugoslav population.

Figure 4
Male survival of survey period, by age

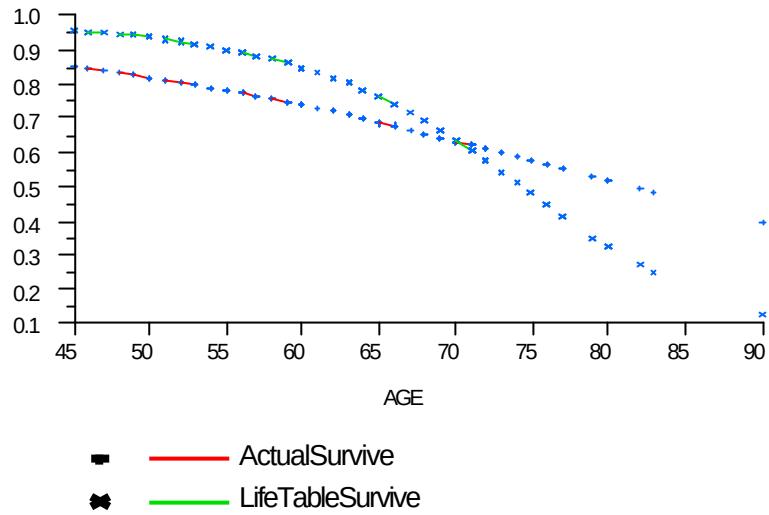
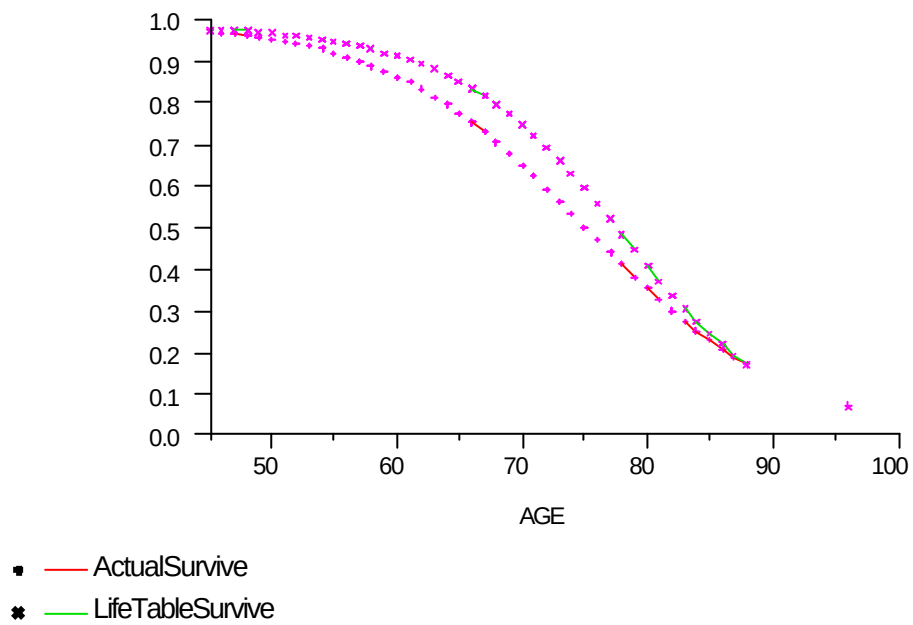


Figure 5
Female survival of survey period, by age



Mortality among the middle aged

I have so far described stagnating or worsening mortality at the extremes of the life span, but there is evidence that the situation worsened for those in the middle years as well. A study of mortality in Belgrade from 1975 to 1989 documented an increase in all cause mortality of 27 per cent among men 30-69, and of 19 per cent among women (Vlajinac et al. 1994). Inspection of the graphs of age standardized mortality rates show, however, that the increase occurred in the second half of the 1980s, having been constant during the previous decade.

Mortality increased in several categories of causes, endocrine, nutritional and metabolic, and cardiovascular most prominent among them. Vlajinac et al. write that the increase in cardiovascular diseases was due to 'rich' diet and heavy smoking, as had been observed in other countries of Eastern Europe during the same period of economic crisis.

The result of these analyses is to suggest that the period before 1991, when Croatia and Slovenia seceded from the Yugoslav federation, was one of deteriorating health. Unfortunately, the temporal associations between economic decline and increasing mortality are at the aggregate level. While declines in real incomes and pensions, increases in the proportion living in poverty (Milanovic 1991), and diminishing support for health and social services have been documented, I have been unable to find any data illuminating the precise mechanisms by which the economic crisis caused mortality to worsen. It does not appear to be coincidental, however, that the economic crisis in Yugoslavia was accompanied by worsening mortality, as it was elsewhere in Eastern Europe and the Balkans. Unhappily, no economic or political intervention was able to dampen the secessionist nationalist passions aroused by the crisis, which by the end of the 1980s had become so inflamed that war was inevitable.

The health consequences of the Third Balkan War

So far I have discussed the small but real health consequences of the political and economic changes that resulted in the secession of Croatia, Slovenia and shortly after Bosnia-Herzegovina from the Yugoslav federation. Those secessions resulted in a war which matches in brutality the two previous Balkan wars. What makes this and the previous Balkan wars so brutal is what made World War II so brutal as well: to a very large degree they have all been wars waged against civilians. The goal was not simply territory, natural resources, or access to markets, but obliteration of the enemy.

Clearly even civilians in the non-combat zones have suffered. In a series of studies, Serbian investigators in Belgrade have attempted to describe the health consequences of United Nations sanctions on the health of the population of Serbia, and particularly of Belgrade. Their data also measure the continuing collapse of the Yugoslav dinar, which has made imports of all sorts prohibitively expensive, as indeed they were even before the war. The hardships imposed by further economic collapse as well perhaps as sanctions has had an increased effect since the late 1980s, as the data in Table 1 illustrate (Vojvodic et al. 1993:39).

Panel A of the table shows that hospitalization rates have declined significantly, particularly for people 60 years of age and above. At the same time, mortality rates of hospitalized patients have increased, suggesting either that only the very sick are now being admitted, that health care has worsened as a result of the inability to import needed medications, or both. Panel B of the table shows that for the total population, and particularly for the elderly, mortality rates have increased substantially from the late 1980s to 1992. Again it is not obvious from the data what the precise reasons are: whether they are sanctions, the collapse of the dinar and the inability to purchase needed medications and vaccines, or a combination of both plus a variety of other factors (see also Legetic et al. 1996).

But the economic collapse of the rump state of Yugoslavia has had other health related effects, for as the economy has deteriorated criminal activity has increased. The result has been in the city of Belgrade a 100 per cent increase in homicides from the pre-war period (Chazan 1994:3) Thus even far from the combat zone the mortality of non-combatants has increased. But of course it is in the combat zone that the dangers are greatest, particularly when civilians have been specially targeted by the warring parties. The data are necessarily incomplete, but some are available.

Table 1
Hospital utilization and mortality, 1985-92

Panel A: Hospital utilization and hospitalized mortality in Belgrade					
	1985	1989	1990	1991	1992
Hospitalization rate per 1,000	111.9	104.0	103.5	107.3	96.9
Hospitalization rate per 1,000 ≥ 60	246.5	192.4	189.5	186.1	166.8
Mortality rate per 1,000 hospitalized patients	28.3	25.8	29.9	31.7	36.4
Mortality rate per 1,000 patients ≥ 60	74.0	71.5	78.9	86.3	96.6
Panel B.: Mortality from all causes, per 100,000 population					
	1988	1989	1990	1991	1992
Belgrade					
All ages	816.3	826.8	889.7	925.2	1026.9
≥ 65	5329.7	5349.3	5665.1	5828.3	6571.7
FR Yugoslavia					
All ages	953.8	963.2	942.9	975.8	1012.2
≥ 65	6162.8	6289.7	6187.2	6336.9	6621.6
Serbia					
All ages	972.9	984.2	961.9	996.7	1031.3
≥ 65	6247.2	6367.0	6264.2	6415.6	6695.7
Montenegro					
All ages	603.3	628.4	641.9	644.8	709.0
≥ 65	4558.5	4810.7	4706.7	4815.2	5180.2

Unlike contemporary civil wars in poorly developed nations, in which infectious diseases have been the leading cause of civilian death, in Bosnia war-related trauma has been the leading cause. Between April 1992 and March 1993 57 per cent of all mortality in Sarajevo was caused by war injuries, compared with 4-11 per cent in Somalia between April 1992 and January 1993 (CDC 1993). In Sarajevo in April 1993 the crude mortality rate was 2.9 per 1,000 compared with 0.8 per 1,000 per month in 1991. The incidence of infectious diseases has of course increased in Bosnia through inability to maintain water supply and sewerage systems. Perinatal mortality and spontaneous abortions have increased and average birthweight has decreased as a result of the inability to maintain prenatal services. Immunization levels have been declining among children, but as yet no epidemics or evidence of mass starvation has been observed. Despite the deterioration of public health, trauma rather than infectious diseases remains the major cause of death.

The massive increase in civilian deaths due to war related trauma has been the result of a clearly stated policy of ethnic cleansing, which refers to the killing of non-combatants and not simply to their forced transfer from one area to another. While all the warring parties have engaged in such behaviour, UN observers are agreed that Bosnian Serbs have caused the vast

majority of deaths, as well as most of the forced movement of populations, rapes, and destruction of homes and cultural monuments which characterize the policy (UN 1994).

What evidence exists from previous European wars indicates that as a proportion of all war-related deaths, civilian deaths (defined as caused by wounds resulting from military equipment) have increased dramatically since the beginning of the century. It is believed that such deaths were few in eighteenth and nineteenth century European wars. In World War I civilians accounted for 19 per cent of all deaths; in the Spanish Civil War 50 per cent; in World War II 48 per cent; in the Korean War 34 per cent; and in the Vietnam War 48 per cent (Garfield and Neugut 1991). It appears that in the Third Balkan War the contribution of civilian deaths to the total may be substantially more than 50 per cent, as the data from Sarajevo suggest. Indeed, in Croatia in 1991 and 1992 the proportion was 64 per cent (Kuzman et al. 1993). These high and increasing rates are associated both with the increasing lethality of weapons, and also with a change in the morality of warfare, which became especially obvious during World War II. Since the Spanish Civil War, often said to have been a dress rehearsal for World War II, civilians have increasingly been the targets of warfare in which Europeans and Americans have been engaged. The purpose was both to create terror and thus demoralization, as well as to obliterate the enemy, whether combatant or non-combatant, from the face of the earth.

Thus the available evidence indicates that the health of certain segments of the Yugoslav population had begun to deteriorate in the decade-and-a-half before the war as the economy deteriorated, and that deterioration of health has continued since the outbreak of war. These patterns are a manifestation of some of the untoward consequences of the only partly successful integration of Yugoslavia into the international economy, of the political and economic weakness of the federation itself, and of the explosions of ethnic hostility that were the result.

War and its Aftermath

... somewhere in sands of the desert
A shape with lion body and the head of a man,
A gaze blank and pitiless as the sun,
Is moving its slow thighs, while all about it
Reel shadows of the indignant desert birds.
The darkness drops again; but now I know
That twenty centuries of stony sleep
Were vexed to nightmare by a rocking cradle,
And what rough beast, its hour come round at last,
Slouches towards Bethlehem to be born?
W.B. Yeats, *The Second Coming*

Yeats's poem was written in the 1920s in Ireland during another bloody nationalist uprising of a 'backward' people whose status was at best one of 'provincial idiosyncrasy'. That it should strike a resonant chord in our own time is attested to by the fact that many authors before me have used it to invoke a sense of foreboding as they view the future, even if this represents, as Said (1993:235) has written, a misreading of Yeats. This foreboding is at odds with the optimistic assumptions that are the legacy of the nineteenth century ideas of nationalism, convergent modernization, and demographic and epidemiologic progress of which we are the inheritors.

In respect of mortality, since the late eighteenth century there clearly has been convergence between the less developed and more developed regions of the world, even

though in the 1970s and 1980s the rate of convergence diminished (Gwatkin 1980; Sell and Kunitz 1986-87; Kunitz and Engerman 1992). But is convergence to be the expected pattern in the future as it has been in the past? Is the association between economic and political modernization on the one hand and demographic and epidemiologic transitions on the other as close as we have generally assumed? Is it nothing more than *fin de siècle* foreboding, or is an alternative possibility likely? That not convergence but increasing divergence will characterize the morbidity and mortality experience of peoples around the world, even as they continue to manifest many of the attributes of modern men and women such as educational attainment, literacy, access to CNN and the Internet? That in some parts of the world integrative, centripetal forces will be overwhelmed by disintegrative, centrifugal forces?

I think such divergence is a real possibility and that the story of the former Yugoslavia illustrates some of the reasons. They have to do with the deteriorating situation that led up to secession and war and with some of the consequences of the kind of warfare that has erupted.

At the outset I said that we see in our own time both centripetal and centrifugal forces at work. The centripetal forces of political, economic and military integration are counterbalanced by the centrifugal forces of devolution, nationalism, ethnic self-determination, and *jihad*, even in the presence of both institutional and individual 'modernization'. I have argued further that the Yugoslav case exemplifies both sets of forces. As a federation Yugoslavia worked remarkably well for more than four decades. It worked largely because it was increasingly well integrated into the Western economy, so much so that shortly before the collapse of the country, membership in the European Community was under serious consideration. But that integration was also one of the sources of the collapse, for it was rising oil prices, unwise borrowing from commercial banks, and the failure of Yugoslav products to compete in the world markets that led to the balance of payments crisis. And it was the internal weaknesses of the federation, notably a single party system of government incapable of uniting republics with a legacy of ethnic and economic conflict, which made it unable to withstand and survive the crisis. Indeed, it was the crisis which made those weaknesses both obvious and fatal.

Moreover, although Yugoslavia was increasingly well integrated into the West, it was of interest to the West primarily because of its strategic location with regard to the Soviet Union and its allies. When the Soviet Union ceased to exist, Yugoslavia became less crucially significant as well. Thus there was no compelling reason to intervene to maintain Yugoslavia's integrity as a nation, or to stop the fighting once it had ceased to exist as a nation.

Broadly conceived, there are two consequences of the collapse of the country, one short, the other long-term. In the short term, it is war and its immediate aftermath that are of overwhelming concern. In the longer term, assuming that peace breaks out, there is the issue of how moderately large republics of the former Yugoslav federation will sustain themselves as rather small independent nations, and specifically for present purposes what the health implications are.

As to the character of the war, as well as to some of its consequences, it is important to note that warfare in Europe has changed significantly over the past several centuries. By the end of the nineteenth century international organizations and conventions had had some effect controlling the most barbaric acts against the enemy and civilians (Howard 1976:116-117).⁵

⁵Kennan has observed that at the very time of the First and Second Balkan Wars a significant peace movement had already emerged in Europe and the United States, which stimulated the two Hague Peace Conferences, in 1899 and 1907, 'resulting in a modernization and renewed codification of international law and in a significant elaboration, in particular, of the laws of war' (Kennan 1993:3).

But not for long. The contribution of civilian deaths to the total of all war-caused deaths more than doubled from World War I to World War II. This was not simply the result of more lethal weapons but of what has been called a 'redefinition of the morality' of war. The older morality was to avoid intentionally killing civilians. That is why General Marshall and several other high ranking American officers resisted the use of the atomic bomb. The Spanish Civil War and then World War II went a long way to destroying that code.

That redefinition of morality was a product of World War II, which included such barbarities as Germany's systematic murder of six million Jews and Japan's rape of Nanking. While the worst atrocities were perpetrated by the Axis, all the major nation-states sliced away at the moral code — often to the applause of their leaders and citizens alike. By 1945 there were few moral restraints left in what had become virtually a total war (Bernstein 1995:143).

One can only speculate why this change occurred. I believe the reasons were somewhat different for Germany and Japan. Both regarded their opponents as racially inferior, but Japan, long isolated from the European conventions of war, did not really share them (Anderson 1991:97). The Germans, however, were a model of what was to come later, for theirs was a policy which led them to disregard generally accepted European conventions of warfare.⁶ Whatever the causes, the result was to destroy the old morality of war and to make it permissible — even though a violation of international law — to terrorize and kill civilians.

The old morality of war was fragile at best and scarcely universal, as is suggested by the evidence from the first two Balkan Wars, the Turkish genocide of Armenians and Greeks, and numerous tribal wars (e.g. Krech 1994). It seems to have been most vulnerable to destruction during wars in which the goal was not simply new markets or access to resources, but in which identity — ethnic, religious, or national — was also at issue. Such wars appear to be most common in frontier situations and when different peoples share or are in conflict over the same territory. They are the kinds of wars we are likely to see more of in future as numerous peoples once thought to have been comfortably and permanently integrated into nation-states struggle for self determination and independence, that is to say, in wars of ethnic identity.

The long term health-related consequences of the break-up of Yugoslavia are of course difficult to predict. The fact that the newly independent nations will be relatively small is not by itself significant, as the low mortality rates of the Scandinavian countries and the Netherlands demonstrates. The more significant issue has to do with the great economic and health inequalities that characterized the republics when Yugoslavia was a federation, and that will characterize the four independent nations into which the federation has fragmented.

Federations are in part a response to the problems encountered by small, weak countries with common borders across which trade and populations move only with great difficulty, and to the problems of defence which can be more effectively provided in common than separately. Almost inevitably there is not perfect equality among the constituent members of any federation, and just as inevitably there will be some redistribution of resources among them, what has been termed horizontal equalization. Along with the problem of vertical equalization (the imbalance between expenditures and revenues at the state and federal levels), this is a major issue for all federations, and the rock upon which the Yugoslav

⁶'Ethnic cleansing' refers not simply to genocide but to the forced removal of people from one area to another. Thus the United States government engaged in ethnic cleansing when it removed the Cherokees from the southeastern United States to Indian Territory. The destruction of an entire people is also not something the Germans created *de novo*. 'It was only in the nineteenth century that the complete destruction of an ethnic group manifested itself as a goal of a state, when Turkey began directing cleansing efforts against Greeks and Armenians' (Bell-Fialkoff 1993:113).

federation foundered. Horizontal equalization poses enormous challenges. On the one hand federations generally are based on some sort of agreement about the minimum standards beneath which no province or state should fall, implying that some will be taxed more than is returned to them by the federal government, and that those in need will receive more than they pay in taxes. On the other hand, if the relatively well-to-do provinces or states believe they are being unfairly taxed, they will attempt to redress the balance, in the most extreme case by secession. These tensions are exacerbated if the states have very different ethnic compositions. This may solve the problem for the well-to-do, although there is no assurance of that. It is likely to prove catastrophic for the poor states or provinces which are now poor countries without a reasonably assured source of foreign aid equivalent to the domestic aid they received when they were part of a federation (Etzioni 1993:29). The result in respect of health and welfare may very well be worsening conditions for the poor new nations and increasing differences from the well-to-do where once there was increasing similarity.

And this brings me back to my starting point, for in this context what Yugoslavia means is that the forces of integration can sometimes promote disintegration. And disintegration, devolution, and divergence are at odds with the theories of modernization which have dominated thinking in the post-World War II period, and which underlie many of our explanations of social and economic development and transitions in the health of populations. It has generally been assumed that backward societies will be able to follow successfully in the steps of economically more advanced societies; that fundamentalism and tribal and ethnic feuding are the result only of backwardness; and that as backwardness is overcome, societies will experience economic, cultural, and demographic convergence (Enzenberger 1993:36-37). Indeed, the collapse of Yugoslavia and of the Soviet Union, along with the continuing deterioration of their peoples' health, not to mention the many other ethnic conflicts occurring round the world, would not have been predicted by either the functionalist or Marxist variants of modernization theory. These events suggest, first, that while much of the received wisdom having to do with convergent modernization may well have been valid in some places and at some periods, it does not comprise a body of universal truths on which a timeless science of society can safely rest; and secondly, that we will need to develop new ways to understand the growing differences in health conditions that are likely to emerge in the future as self-determination and secessionist movements undermine many nation-states.

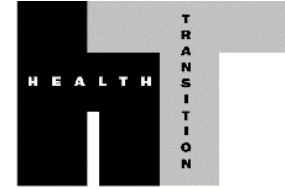
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Appendices to Kunitz on mortality calculations



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Observed survival

Survey data provided information on survival of the survey period for each case. The proportions surviving, for each sex and age, could be estimated from these data, but rates for individual ages, or even for five-year age groups, were very unreliable because of the small number of cases. A more reliable estimate of the age trend in the proportion of each sex surviving was therefore obtained by fitting logistic curves, i.e., for each sex, the probability of surviving from age **A** was modelled as

$$\text{Prob}(\text{surviving from age } A) = 1/[1+\exp(-a-bA)] \text{ for some } a \text{ and } b.$$

For each sex, logistic regression was used to estimate the parameters α and β , yielding estimated models

$$\text{Prob}(\text{surviving from age } A) = 1/[1+\exp(-3.931+.04831A)] \quad \text{for males,}$$

and

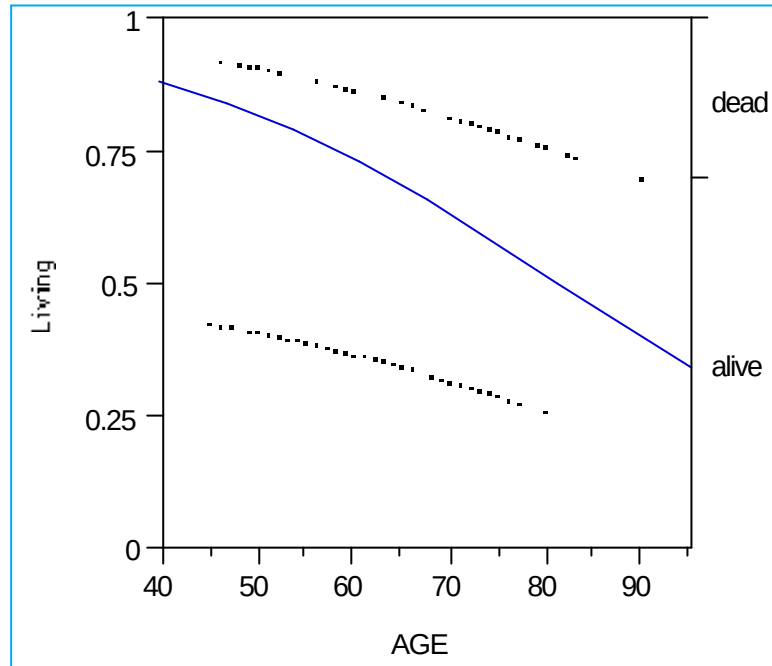
$$\text{Prob}(\text{surviving from age } A) = 1/[1+\exp(-9.243+.12310A)] \quad \text{for females.}$$

$$= 1/[1+\exp(1.38-5.3114S-.02647A+.07479SA)] .$$

Figures 1 and 2 show these logistic regression fits: the solid curve always is the modelled proportion of survival; the dots above and below it give an indication of where the individual observations were.

In summary, female proportions surviving decrease rapidly with age, as one would expect. Male proportions decrease much more slowly: Figure 3 shows that at ages up to 70 they are below those of females, as one would expect, but above age 70 male proportions surviving decrease very slowly and indeed exceed those of females, a most surprising result. It is difficult to know how to account for this result which does not seem to be due to a too small number of men above 70: about a third of those surveyed were in this age group. In any case it is obviously spurious as it suggests a probability of more than 40 per cent for males to survive to age 90. Clearly, therefore, the data for males at advanced ages must be discounted. Whether this casts doubt also on the data for earlier ages, and for females, is unclear.

Figure 1
Survival by age - males



Converged by Gradient

Whole-Model Test

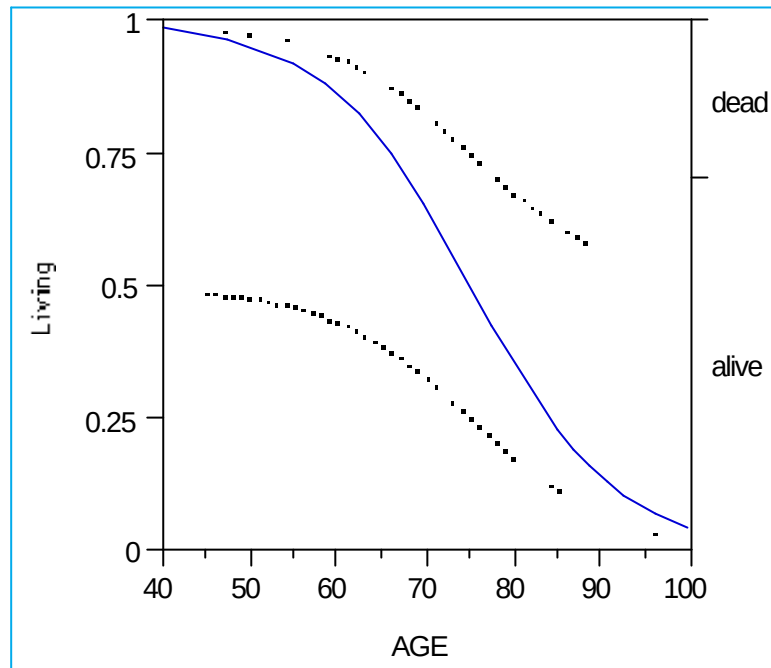
Source	DF	-LogLikelihood	ChiSquare	Prob>ChiSq
Model	1	3.036037	6.072075	0.013734
Error	137	82.126750		
C Total	138	85.162788		

RSquare (U)	0.0356
Observations (or Sum Wgts)	139

Parameter Estimates

Term	Estimate	Std Error	ChiSquare	Prob>ChiSq
Intercept	3.93132203	1.3163508	8.92	0.0028
AGE	-0.0483117	0.0200902	5.78	0.0162

Figure 2
Survival by age - females



Converged by Gradient

Whole-Model Test

Source	DF	-LogLikelihood	ChiSquare	Prob>ChiSq
Model		23.35248	46.70497	0.000000
Error	170	81.20280		
C Total	171	104.55529		

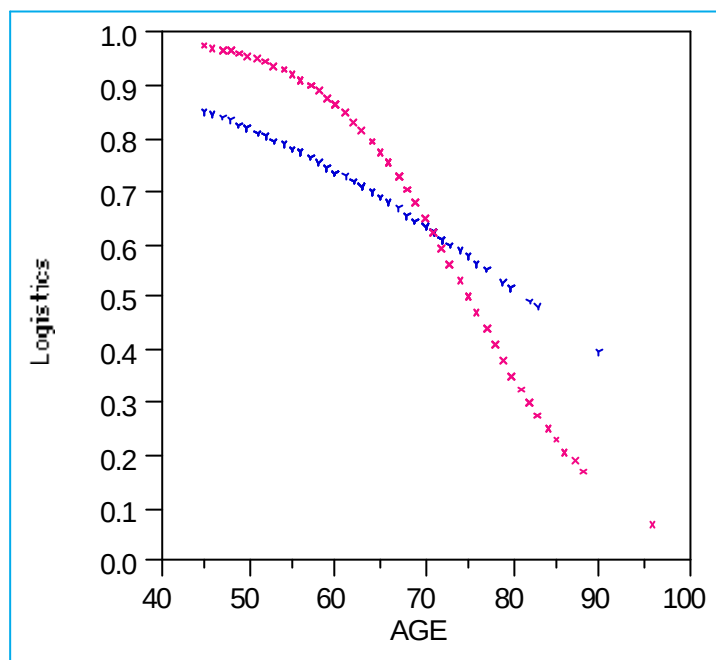
RSquare (U)	0.2234
Observations (or Sum Wgts)	172

Parameter Estimates

Term	Estimate	Std Error	ChiSquare	Prob>ChiSq
Intercept	9.24278023	1.5285463	36.56	0.0000
AGE	-0.1230984	0.0216793	32.24	0.0000

Figure 3
Survival by Age and Sex

$$1/(1+\exp[1.38-5.3114*\text{SEX}-0.02647*\text{AGE}+.07479*\text{AGE}*\text{SEX}])$$



Footnote Male - Y, SEX=1, Female - X, SEX=2

Survival probabilities: life table computations and interpolation

The 1979 mortality experience of Yugoslavia was used as a baseline for comparing the actual mortality experience of the surveyed group. The proportions surviving during the survey were compared to corresponding estimated probabilities of survival according to the 1979 experience.

For this purpose, the 1979 age and sex specific mortality rates were used to compute a life table for each sex, resulting in function l_A which shows the probability of surviving from birth to exact age A , computed at five-yearly intervals - see accompanying life tables. In order to be able to interpolate the function l_A for other ages, and be able to compute the probability of surviving the years of the survey, the logits of l_A for each sex and for ages 40 and above (ages of people in the survey) were fitted by a cubic in age - see Figures 4 and 6. The fitted cubics were then back transformed (inverse of logit) to yield fitted l_A 's

$$l_A \text{ fit} = 1/\{1+\exp[-(5.532-21.654 a+41.593 a^2-29.943 a^3)]\} \text{ for males,}$$

and

$$l_A \text{ fit} = 1/\{1+\exp[-(6.189-25.274 a+49.388 a^2-34.059 a^3)]\} \text{ for females,}$$

where $a=A/100$.

These back-transformed cubics were found to yield the function very closely for ages 40 and above - see **I** and **I Fit** functions in life tables and Figures 5 and 7. It was therefore felt that these functions could be used with confidence to gauge probabilities of survival after age 40.

Table 1
Male Life Table 1979, with interpolation

Initial Age	m	p	I	logit I	logit I Fit	I Fit
0	0.0092	0.99084213	1	•	5.532	0.99605754
1	0.035	0.86915888	0.99084213	4.68394118	5.31958936	0.99512908
5	0.0012	0.99401795	0.86119923	1.82528629	4.54953962	0.98953853
10	0.0005	0.99750312	0.85604749	1.78284241	3.752587	0.97708064
15	0.0004	0.998002	0.85391004	1.76560329	3.11868488	0.95765693
20	0.0009	0.9955101	0.85220393	1.75199244	2.625376	0.93247699
25	0.0014	0.99302441	0.84837762	1.72193277	2.25020313	0.90466805
30	0.0014	0.99302441	0.84245969	1.67664446	1.970709	0.87768725
35	0.0018	0.99104032	0.83658304	1.63302083	1.76443638	0.85376441
40	0.0027	0.98659051	0.82908752	1.57917414	1.608928	0.8332625
45	0.004	0.98019802	0.81796989	1.50265339	1.48172662	0.81483324
50	0.0066	0.96753566	0.80177246	1.39740931	1.360375	0.79582064
55	0.0101	0.95074372	0.77574345	1.24103115	1.22241588	0.77248842
60	0.0151	0.92724645	0.73753321	1.03318658	1.045392	0.73988906
65	0.0226	0.89304307	0.68387505	0.77163769	0.80684613	0.69143703
70	0.0358	0.83570445	0.61072987	0.45038124	0.484321	0.6187677
75	0.0571	0.75016408	0.51038967	0.04156468	0.05535938	0.51383631
80	0.0873	0.64169916	0.382876	-0.4773588	-0.502496	0.37695428
85	0.1622	0.42298115	0.24569121	-1.1217263	-1.2117024	0.22939997
90	0.2191	0.29219835	0.10392275	-2.1543788	-2.094717	0.10961136

a_i =age at beginning of interval/100,

m_i =death rate in interval,

$p_i=(1-int*m_i/2)/(1+int*m_i/2)$ =survival in interval

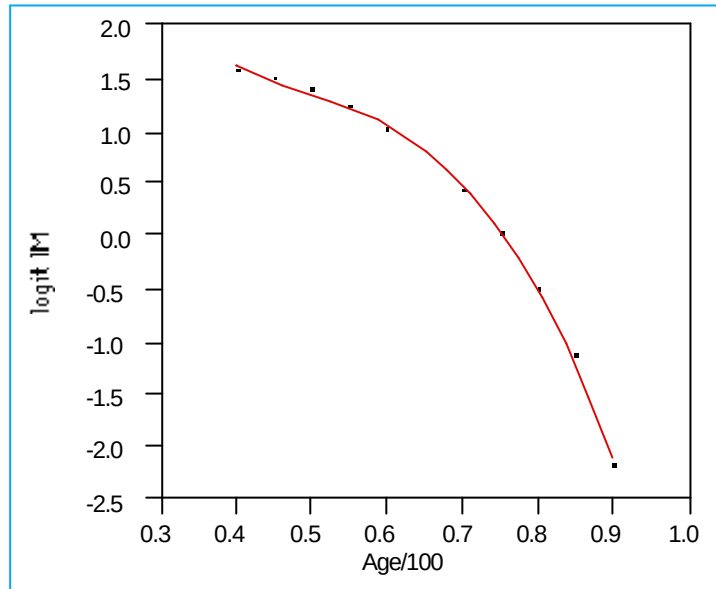
$I_i=\prod_{e=1}^{i-1} p_e$ = survival from birth to beginning of age interval

logit I_i=log[I_i/(1- I_i)]

logit I_i fit = 5.532-21.654 a_i +41.593 a_i^2 -29.943 a_i^3 ,

I_i Fit = 1/[1+exp(- **logit I_i fit**)] ,

Figure 4
Interpolation of survival probabilities by a logistic polynomial fit for l_M from age 40



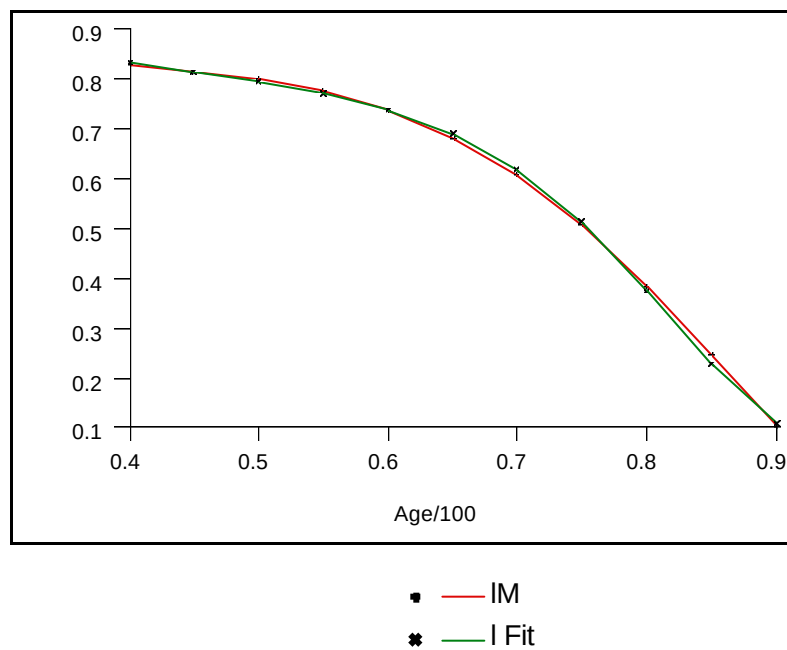
Polynomial Fit, degree=3

RSquare 0.998762

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	5.5322484	1.30126	4.25	0.0038
Age/100	-21.65365	6.38662	-3.39	0.0116
Age/100^2	41.593488	10.1038	4.12	0.0045
Age/100^3	-29.94314	5.16919	-5.79	0.0007

Figure 5
Male survival from birth

1979 life table (l_M) and logistic interpolation from age 40



Interpolation formula $l_M \text{ Fit} = 1/[1 + \exp(-\text{logit fit})]$, where

logit fit = $5.532 - 21.654a + 41.593a^2 - 29.943a^3$, with $a = \text{age}/100$.

Table 2
Female Life Table 1979, with interpolation

Initial Age	m	p	l	logit l	Fitted logit	l Fit
0	0.008	0.99203187	1	•	6.189	0.99795232
1	0.0318	0.88040617	0.99203187	4.82430572	5.94116474	0.99737793
5	0.0011	0.99451508	0.87339098	1.93127955	5.04451263	0.99359667
10	0.0004	0.998002	0.8686005	1.88864102	4.121421	0.98403749
15	0.0003	0.99850112	0.86686504	1.87351993	3.39418087	0.96752218
20	0.0005	0.99750312	0.86556571	1.8623078	2.837248	0.94465576
25	0.0005	0.99750312	0.8634045	1.8438593	2.42507812	0.91871975
30	0.0006	0.99700449	0.86124868	1.82570006	2.132127	0.89398676
35	0.0008	0.99600798	0.85866881	1.80427728	1.93285037	0.87356458
40	0.0013	0.99352106	0.85524099	1.77631292	1.801704	0.85835624
45	0.002	0.99004975	0.84969993	1.73224951	1.71314362	0.84724358
50	0.0031	0.9846192	0.84124521	1.66752234	1.641625	0.83775593
55	0.005	0.97530864	0.82830618	1.57367011	1.56160387	0.82658338
60	0.0077	0.96222713	0.80785418	1.43612699	1.447536	0.80961893
65	0.013	0.937046	0.7773392	1.2502273	1.27387713	0.78140573
70	0.0218	0.89663348	0.7284026	0.98653308	1.015083	0.73401372
75	0.0388	0.82315406	0.65311015	0.63273851	0.64560937	0.65602036
80	0.0638	0.72488141	0.53761027	0.15072579	0.139912	0.53492105
85	0.1355	0.49393091	0.38970369	-0.4485579	-0.5275534	0.37108771
90	0.2067	0.31860887	0.1924867	-1.4339325	-1.382331	0.20063489

a_i =age at beginning of interval/100,

m_i =death rate in interval,

$p_i=(1-int*m_i/2)/(1+int*m_i/2)$ = survival in interval

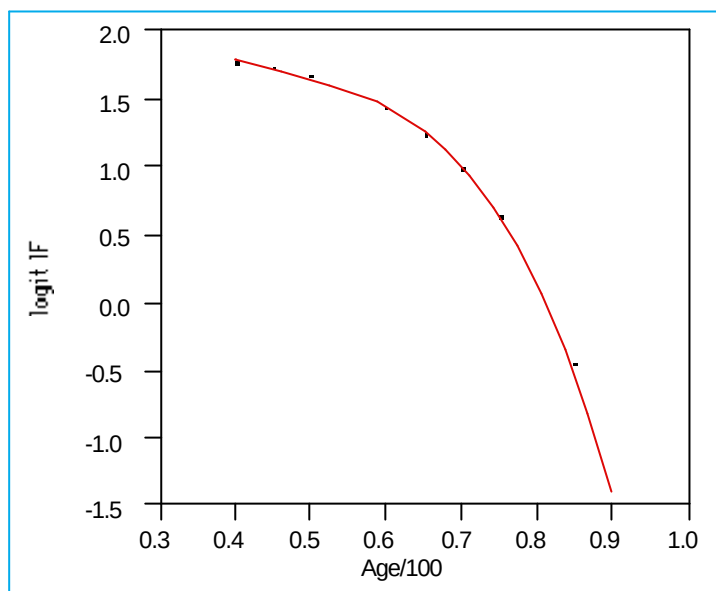
$l_i=\prod_{e=1}^{i-1} p_e$ = survival from birth to beginning of age interval

$\text{logit } l_i=\log[l_i/(1-l_i)]$

$\text{logit } l_i \text{ fit} = 6.189-25.274a_i+49.388a_i^2-34.059a_i^3,$

$l_i \text{ Fit} = 1/[1+\exp(-\text{logit } l_i \text{ fit})]$,

Figure 6
Interpolation of survival probabilities by a logistic polynomial fit for l_F from age 40



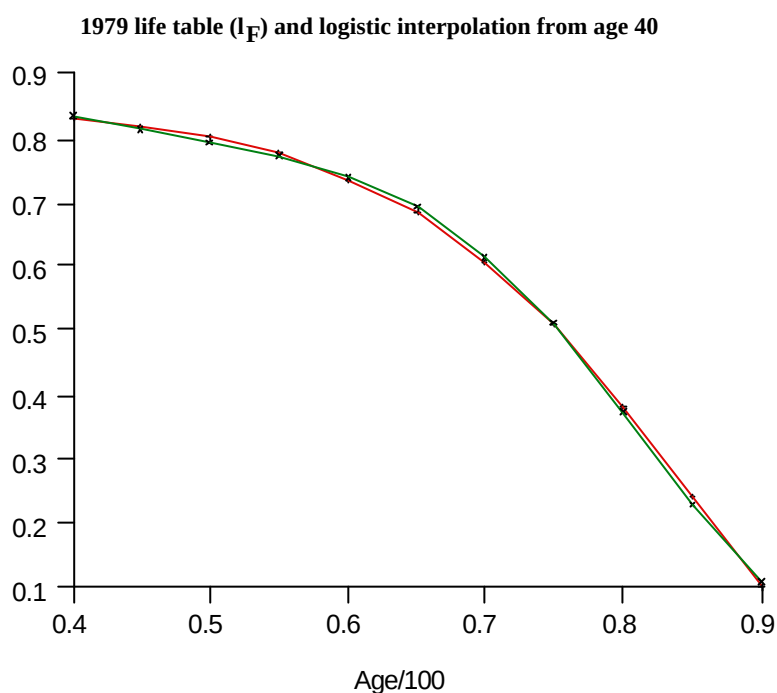
Polynomial Fit, degree=3

RSquare

0.99884

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	6.1885767	1.08327	5.71	0.0007
Age/100	-25.27399	5.31673	-4.75	0.0021
Age/100^2	49.387916	8.41117	5.87	0.0006
Age/100^3	-34.05944	4.30325	-7.91	0.0001

Figure 7
Female Survival from Birth,



Interpolation formula $l_F \text{ Fit} = 1/[1 + \exp(-\text{logit fit})]$, where

$\text{logit fit} = 6.189 - 25.274a + 49.388a^2 - 34.059a^3$, with $a = \text{age}/100$.

Comparison of observed and expected survival.

Survival of the period (9 1/8 years) of the survey was compared to expected survival based on the 1979 death rates by age and sex. The plots in the text show, separately for each sex and as a function of age, the actual survival proportions (+) of the survey and the corresponding probabilities (x) of surviving 9.125 years according to the 1979 death rates. Both the proportions and the probabilities are interpolated in the available observations. The former were fitted by logistic regression on age, as discussed in 'Observed Survival'. The latter were calculated as $(l_{A+9.125} \text{ fit})/(l_A \text{ fit})$ by interpolating in the survival function l_A , as discussed in 'Survival Probabilities'.

On the changing shape of the Australian mortality curve*



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Abstract

Over the course of the twentieth century, mortality rates in Australia have shown substantial improvements at all ages. The improvements which have taken place at different ages, however, have not occurred at a uniform pace, and as a result, the shapes of the national mortality curves have varied over time. The most noticeable change for males has been the development of an 'accident hump' in the late teens and early twenties mid-century, the growth of this 'hump' in the 1960s and 1970s, and its sudden disappearance, or transformation into a 'bulge', in the late 1980s. This paper examines the reasons for the disappearance of the male 'accident hump', and the changes in mortality by cause which have occurred over the decade to 1992 and influenced the level and shape of the whole mortality curve both for males and for females. Extrapolating the trends observed for the various cause-specific mortality rates obtains projected life tables for Australian males and females in the year 2002.

The Australian population has enjoyed remarkable improvements in mortality over the twentieth century. Expectation of life at birth for females rose from 59 years in the early years of the century to more than 80 years in 1992, and these improvements in longevity show no signs of abating. For males, the corresponding increase has been from 55 to 74. The improvements in mortality which have taken place have not occurred at a uniform pace in all age groups, and as a result, the mortality curve (q_x plotted against age x) has undergone several important changes in shape. The increasing prominence of the so-called 'accident hump' at the younger adult ages for males (Figure 1), has been remarkable. A similar but less spectacular pattern for females emerged rather later (Figure 2).

But even more remarkable, perhaps, than the development of the male accident hump has been its sudden disappearance in the late 1980s (Figure 3), and its transformation to an 'accident bulge' not unlike that observed for the females a few years earlier. Random breath testing of drivers for alcohol was introduced in 1983, and there would appear to be a change in attitude among young adults concerning drink-driving. At the same time, compulsory use of seat-belts has been legislated, and there has been greater use and awareness of radar

* There are several people and organizations I would like to thank for assistance in the preparation of this paper: Edward Fabrizio and Warren Gratton of the Cologne Life Reinsurance Company of Australia for providing deaths data by cause for 1992 in a format which could be readily rearranged for input to LIFETIME, the World Health Organization (Geneva) for supplying the Australian mortality data for 1982 in the standard LIFETIME format, and Jenny Wildgoose, who kindly re-arranged some of the large files into the format I required and prepared some of the figures.

Figure 1

Mortality $q(x)$ curves of Australian males according to Australian Life Tables (Males) A1932-34, A1953-55, A1970-72 and the 1982 data.

Figure 2

Mortality $q(x)$ curves of Australian females according to Australian Life Tables (Females) A1932-34, A1953-55, A1970-72 and the 1982 data.

speed checks. The substantial decline in motor accident fatalities has also been widely publicized. An initial hunch, therefore, for the disappearance of the 'accident hump' would be the marked decline in motor vehicle deaths (1,408 and 658 for males and females respectively in 1992 compared with 2,492 and 872 in 1982), a large proportion of these being at the early adult ages, and the appearance of AIDS-related deaths which occur predominantly in the age range 25-40. The decline in the motor vehicle death rates at the early adult ages would drastically reduce the 'accident hump' and the rise in mortality in the late twenties and early thirties due to AIDS would convert the remaining 'hump' into a 'bulge'. In broad terms, the data support this hypothesis (Table 1). There are however changes in other causes of death which cloud the picture a little, and among these, the disturbing increase in suicides of males of all ages, from 1,318 in 1982 (a little over half the number of male road deaths that year) to 1,811 in 1992 (about 30 per cent higher than the number of road deaths) is particularly noteworthy. The sizes of the changes which have taken place are evident from Table 1. This paper examines the changes which occurred in Australian mortality, by cause, over the decade 1982-1992, and the effects these changes have had on the shape of the national life tables.

Table 1
Australian males. Changes in cause-specific mortality rates per 100,000 between 1982 and 1992 and their effects on the all-causes mortality rate per 100,000 over that period^a.

	Ages 15-19	Ages 20-24	Ages 25-29	Ages 30-34
All cause rate in 1982	128	161	142	135
Motor accid. 1982	67	75	49	34
Motor accid. 1992	28	34	26	20
Change	-39	-41	-23	-14
Suicide 1982	12	27	28	21
Suicide 1992	19	34	32	28
Change	+7	+7	+4	+7
AIDS flagged 1982	0	0	0	0
AIDS flagged 1992	0	2	10	17
Change	+0	+2	+10	+17
All other causes 1982	49	59	65	80
All other causes 1992	36	50	60	71
Change	-13	-9	-5	-9
All cause rate in 1992	83	120	128	136

^a100,000 $\int m_x$

Figure 3
Mortality rates per 1000 for Australian males aged 18-38, according to the experiences of 1983, 1986, 1989 and 1992 (reproduced from Fabrizio, 1993)



The data

All the analyses for this article were performed using the World Health Organization mortality package LIFETIME, which requires deaths by cause in the age groups 0, 1, 2, 3, 4, 5-9, 10-14, 15-19, ..., 80-84, 85+. The same age groups are used for the mid-year population. The 1982 data in this format were kindly provided by WHO, although their original source was of course the Australian Bureau of Statistics (ABS). The 1992 deaths on the other hand were coded into the required form from the individual death records now made available by the Australian Bureau of Statistics, and the help of Mrs Jenny Wildgoose and the Cologne Life Reinsurance Company of Australia in this task is gratefully acknowledged. A major advantage of the individual deaths record is that AIDS deaths were flagged. AIDS deaths were virtually unknown in 1982, and were certainly not coded, and for the purpose of this paper, are assumed to be zero. Because of the age groupings used, there will be some minor differences between life table values produced by LIFETIME and those published annually by ABS, but these are of no consequence. The LIFETIME program in fact has a slight graduation effect, something which is absent from the annual tables produced by ABS. The cause-of-death codings used throughout have been the B codings under the Ninth Revision of the International Classification of Diseases. The Australian Life Tables, prepared by the Australian Government Actuary and published by ABS, are graduated tables based on deaths over three years around the time of a census. Three years of deaths are used to reduce the effects of statistical variation in the numbers of deaths and of other factors which are not believed to be annual events, such as influenza epidemics. The present analysis uses data from individual years and thus is subject to greater statistical variation. The higher mortality of females aged four in 1992 compared with males the same age, for example, is probably of this nature. The effect is reproduced in the abridged life tables which are reported later in this paper.

Table 2
Crude mortality rates per 100,000, by cause. Australian males and females, 1982 and 1992.

Cause group	Males 1982	Males 1992	Females 1982	Females 1992
1 Infect. dis. B1-B7	4	5	3	5
2 'Smoking' neopl. B8-B10	65	64	17	23
3 Breast cancer B11.3	0	0	26	28
4 All other neopl. B9 B11 -B17 excl. B11.3	124	146	100	109
5 Ischaemic heart dis. B27	250	196	177	164
6 Cerebrovascular dis. B29	74	56	110	81
7 Other circul. B25 B26 B28 and B30	68	59	82	72
8 Respiratory dis. B31-B32	77	68	41	47
9 Cirrhosis B34.7	12	9	5	3
10 Obstetrics B38-B41	0	0	0.33	0.10
11 Congen./perinatal B44- B45	15	11	12	8
12 Non-motor accid. B47-B53 excl. B47.1	25	19	12	11
13 Motor accid. B47.1	33	16	11	8
14 Suicide B54	17	21	6	5
15 Other violence B55-B56	3	4	1	2
16 AIDS flagged	0	7	0	0.25
17 All other causes ^a	68	77	74	91
All causes	835	759	677	656

^a B18-B24, B33-B37 excluding B34.7, B42-B43, B46

Table 3
Australian males and females. Changes in the crude mortality rates per 100,000 over the decade 1982 to 1992.

<i>Males:</i>	
CMR per 100,000 in 1982	835
Effect of changed mortality	-203
Effect of changed age structure	+127
CMR per 100,000 in 1992	759
<i>Females:</i>	
CMR per 100,000 in 1982	677
Effect of changed mortality	-124
Effect of changed age structure	+103
CMR per 100,000 in 1992	656

Crude mortality rates

Crude mortality rates per 100,000 for Australian males and females in 1982 and 1992 are exhibited in Table 2 for 17 selected causes of death (the causes are mutually exclusive and exhaustive) and for all causes combined. It is immediately apparent that over the decade a number of significant changes have taken place. Whilst ischaemic heart disease (IHD) remains the dominant killer for both sexes, its relative importance has continued to decline rapidly. So too has the importance of cerebrovascular disease, the second most important female killer and third most for males, and 'other circulatory diseases'. The changes which have taken place in motor vehicle mortality and suicide noted above are of course clearly reflected in the table. Changes in the contributions of other causes are also suggested by this table, but care must be exercised, since the effect of age structure changes can be significant, as is shown by the analyses in Table 3, based on the method of Kitagawa (1955). Male mortality from all causes, for example, has improved rather more than a direct comparison of crude rates in 1982 and 1992 would suggest: a proportionate fall of 203/835 or around 25 per cent (rather than 77/835) indicating an increase in life expectancy at the younger ages of almost three years. On the other hand the proportionate change in overall female mortality, based on the Kitagawa adjustment, is lower: a fall of 124/677 or around 18 per cent, indicating an improvement in life expectancy at the younger ages of around two years¹. At long last the gulf between male and female life expectancy which has continued to widen for so many years now appears to be narrowing.

Standardized mortality rates

To avoid the problems inherent in the study of crude mortality rates, caused by changing age structures, standardized mortality rates per 100,000 were computed for the same selected causes and for all causes combined. These are exhibited in Table 4. The standard population used was the Australian population of 1992, males and females combined. From this table, further interesting results emerge. Whereas males have enjoyed a substantial reduction in mortality from 'smoking' cancers and from respiratory diseases, female 'smoking' cancer mortality deteriorated over the decade and female respiratory disease mortality stagnated. Mortality from homicide and other violence, albeit a small proportion of total mortality, increased for females as well as for males. The ratios of the all-causes standardized mortality rates also reveal the sex differentials in life expectancy at the younger ages: about seven years in 1982 ($1,138/637=1.8$) and around six years in 1992 ($887/521=1.7$)².

¹Under the Gompertz 'law' of mortality, which provides a good approximate representation of mortality beyond age 30 (where nowadays most deaths in a developed population occur), the force of mortality increases by around eight or nine per cent from one age to the next. So if mortality at all ages decreased by 25 per cent, the effect would be equivalent to treating all lives as being almost three years younger than in the original life table.

² See the Gompertz 'law' explanation in Footnote 1.

Table 4
Standardized^a mortality rates per 100,000, by cause. Australian males and females, 1982 and 1992.

Cause group	Males 1982	Males 1992	Females 1982	Females 1992
1 Infect. dis. B1-B7	5	6	3	4
2 'Smoking' neopl. B8-B10	81	71	17	20
3 Breast cancer B11.3	0	0	26	25
4 All other neopl. B9 B11-B17 excl. B11.3	164	169	98	94
5 Ischaemic heart dis. B27	344	233	166	125
6 Cerebrovascular dis. B29	115	70	100	59
7 Other circul. B25 B26 B28 and B30	105	73	73	52
8 Respiratory dis. B31-B32	117	84	37	37
9 Cirrhosis B34.7	13	10	5	3
10 Obstetrics B38-B41	0	0	0.32	0.10
11 Congen./perinatal B44-B45	14	10	12	8
12 Non-motor accid. B47-B53 excl. B47.1	29	21	12	8
13 Motor accid. B47.1	33	17	11	8
14 Suicide B54	19	21	6	5
15 Other violence B55-B56	3	4	1	2
16 AIDS flagged	0	7	0	0.25
17 All other causes ^b	96	93	70	70
All causes	1138	887	637	521

^aThe Australian female population 1992 was used as standard. ^bB18-B24, B33-B37 excluding B34.7, B42-B43, B46

Australian life tables in 1982 and 1992

Abridged life tables for Australian males and females in 1982 and 1992 are presented in Tables 5 and 6. Full life tables were also computed using LIFETIME, but for the sake of conciseness are not reproduced here. As was noted above, the observed female mortality rate at age four in 1992 was higher than the corresponding male rate. The most likely explanation is statistical variation, particularly as the observed numbers of deaths are so small. The aberration is reflected in the life tables, which suggest slightly higher female mortality near age four in 1992. Fortunately, the effect of such statistical error on life expectancy and other important measures is insignificant. The abridged tables indicate that mortality rates at all ages under the 1992 table are lighter than those under the 1982 table, for both sexes. In the early thirties, for males, however, the differences between the 1992 rates and the 1982 rates are small. AIDS deaths in 1992, which were virtually non-existent in 1982, are probably a significant factor contributing to this feature. The full male life table for 1992 provided by LIFETIME gives mortality rates at ages 32 and 33 which are higher than the same rates in

1982. Table 5 reveals that life expectancy at birth for males improved 3.32 years over the decade, compared with 2.28 years for females (Table 6), resulting in a narrowing of the sex differential in life expectancy at birth from 7.03 to 5.99 years, results which I anticipated in my earlier examination of the Kitagawa-adjusted crude mortality rates and the standardized mortality rates.

Table 5
Abridged life tables for Australian males, 1982 and 1992 and projected for 2002

Age		1982 experience			1992 experience			2002 (projected)		
x	1_x	10^5q_x	oe_x	1_x	10^5q_x	oe_x	1_x	10^5q_x	oe_x	
0	100000	1159	71.16	100000	794	74.48	100000	622	76.83	
1	98841	107	70.99	99206	61	74.08	99378	54	76.30	
2	98736	69	70.07	99146	48	73.12	99324	37	75.34	
3	98668	54	69.12	99098	34	72.16	99287	26	74.37	
4	98614	45	68.15	99065	24	71.18	99261	20	73.39	
5	98570	40	67.18	99041	20	70.20	99242	17	72.41	
10	98387	37	62.30	98943	20	65.26	99164	15	67.46	
15	98167	78	57.44	98823	46	60.34	99069	37	62.52	
20	97542	170	52.79	98413	118	55.58	98742	98	57.72	
25	96760	148	48.19	97826	125	50.90	98243	108	53.00	
30	96076	134	43.52	97201	132	46.21	97693	117	48.28	
35	95430	146	38.80	96542	142	41.51	97106	126	43.56	
40	94654	205	34.09	95814	176	36.80	96454	155	38.84	
45	93466	351	29.49	94845	253	32.15	95606	219	34.16	
50	91396	606	25.10	93408	408	27.60	94359	348	29.58	
55	88006	1019	20.96	91048	693	23.25	92338	584	25.16	
60	82609	1659	17.16	87154	1199	19.17	89015	1000	21.00	
65	74641	2668	13.71	80792	2023	15.47	83594	1671	17.19	
70	63226	4263	10.71	71255	3257	12.18	75412	2663	13.77	
75	48534	6718	8.17	58166	5306	9.33	63971	4281	10.76	
80	31875	10232	6.12	48949	6761	8.27	48949	6761	8.27	
85	16743	15263	4.47	24432	12696	5.25	32192	10100	6.27	

The change in life expectancy at birth

The approximate sizes of the improvements in life expectancy at birth were evident from the changes in standardized mortality rates reported in the fourth section, where the major contributing causes were also identified in general terms. Precise details of the contributions of the selected causes within selected age ranges to these improvements in life expectancy are readily obtained using the decomposition method of Pollard (1982, 1988) included in the LIFETIME package. The results are shown as Tables 7 and 8 for males and females respectively. In the case of the males (Table 7), we see for example that improvement in ischaemic heart disease mortality contributed more than 40 per cent of the increase in life expectancy at birth (1.34 years out of 3.32) and that IHD mortality improvement between 50

Table 6
Abridged life tables for Australian females, 1982 and 1992 and projected for 2002

Age	1982 experience			1992 experience			2002 (projected)		
x	l_x	$10^5 q_x$	oe_x	l_x	$10^5 q_x$	oe_x	l_x	$10^5 q_x$	oe_x
0	100000	908	78.19	100000	601	80.47	100000	474	82.11
1	99092	91	77.90	99399	61	79.95	99526	48	81.50
2	99001	55	76.97	99339	35	79.00	99478	32	80.54
3	98946	35	76.01	99304	27	78.03	99446	24	79.57
4	98912	24	75.04	99277	25	77.05	99422	21	78.59
5	98888	21	74.06	99253	22	76.07	99401	19	77.60
10	98795	18	69.12	99167	14	71.13	99327	12	72.66
15	98694	30	64.19	99091	23	66.19	99261	20	67.70
20	98489	47	59.32	98924	43	61.29	99122	37	62.80
25	98258	50	54.45	98712	43	56.42	98940	37	57.91
30	98000	54	49.59	98494	50	51.54	98745	45	53.02
35	97721	70	44.72	98218	66	46.68	98495	59	48.14
40	97303	118	39.91	97850	95	41.84	98162	86	43.30
45	96582	202	35.18	97293	150	37.07	97650	138	38.51
50	95377	339	30.59	96398	250	32.39	96819	231	33.82
55	93417	530	26.18	94913	408	27.85	95446	374	29.27
60	90504	825	21.94	92592	642	23.48	93313	585	24.87
65	86049	1317	17.93	89039	1030	19.31	90054	928	20.68
70	79375	2104	14.22	83512	1728	15.41	85048	1523	16.74
75	69582	3558	10.85	74824	2990	11.89	77294	2564	13.15
80	55255	6213	7.97	61682	5246	8.86	65673	4364	10.01
85	36828	10474	5.68	43851	8864	6.41	49700	7218	7.39

and 70 years of age alone contributed almost 25 per cent (0.75 years). Circulatory disease mortality improvement as a whole contributed almost two-thirds of the total increase. A gain of more than a quarter of a year of life came as a result of motor accident mortality reduction in the age range 15-29 with almost as much again gained from motor accident mortality reduction at all other ages. The advent of AIDS on the other hand reduced life expectancy by a sixth of a year, predominantly as result of deaths in the age range 30-49. Decreased mortality from 'smoking' cancers added a seventh of a year of life. The female analysis is shown in Table 8. Improved IHD mortality produced a third of the increase in life expectancy (0.74 years out of 2.29). Reduced mortality from circulatory diseases as a whole produced two-thirds of the gain (1.51 years). Other causes had relatively minor effect. Increased 'smoking' cancers mortality at the older ages had the effect of reducing life expectancy by 0.05 years, whilst improved motor accident mortality increased life expectancy by a seventh of a year.

Table 7
Contributions of mortality changes by age and cause^a to the change in life expectancy at birth of Australian males between 1982 and 1992. The contributions shown are hundredths of a year of life^b.

Cause	Age group
-------	-----------

group	0	1-4	5-14	15-29	30-49	50-69	70+	All ages
1	1	0	0	0	0	0	-1	0
2	0	0	0	0	2	8	4	14
3	0	0	0	0	0	0	0	0
4	0	0	1	1	5	0	-4	4
5	0	0	0	0	15	75	43	134
6	0	0	0	1	2	16	22	41
7	0	0	0	1	3	9	15	28
8	0	1	1	1	2	10	16	32
9	0	0	0	0	2	3	1	6
10	0	0	0	0	0	0	0	0
11	17	1	0	0	0	0	0	18
12	0	2	2	4	4	3	1	18
13	0	2	5	27	7	4	1	47
14	0	0	0	-4	-3	0	0	-8
15	0	0	1	-1	-1	-1	0	-1
16	0	0	0	-3	-11	-2	0	-17
17	8	1	1	-2	0	6	0	15
All causes	27	8	12	26	28	132	99	332

^aFor a description of each cause group, see for example Table 2. ^bBecause of rounding, row and column sums may not tally exactly with the totals shown.

The differential in life expectancy at birth

The method used to study the change in life expectancy at birth of a population can also be used to analyse sex differentials in life expectancy, and in particular sex differentials in life expectancy at birth (Tables 9 and 10). From the first of these tables, we see that the major causes producing the sex differential in life expectancy at birth were, in descending order of magnitude: ischaemic heart disease contributing 2.38 years (almost three times the contribution of its next rival), 'smoking' neoplasms (0.85 years), respiratory diseases (0.80 years), all other neoplasms excluding breast cancer (0.77 years), and motor vehicle accidents (0.63 years). Whilst IHD maintained its number one position in 1992, its contribution fell dramatically to 1.69 years (Table 10). All other neoplasms (excluding breast cancer) moved up into second position with a much increased value of 1.04 years, whilst 'smoking' neoplasms, with a marginally lower contribution than in 1982 (0.81 years), dropped to third position. Like 'smoking' cancers, respiratory diseases suffered a fall in contribution as well as a step down in rank, to fourth position. The contribution of motor accident mortality to the sex differential fell to less than half of its 1982 value, with the result that this cause was ranked 7 in 1992, behind suicide and non-motor accidents. Breast cancer reduced the differential in life expectancy at birth by almost half a year of life in 1982 and in 1992. Whilst prostate cancer has not been separated out in this analysis, a calculation with the 1982 data using the same subroutine revealed that 0.27 years (virtually all in the 70+ age group) of the 0.77 years contributed to the sex differential by all other cancers other than breast cancer could be attributed to this particular male neoplasm.

Table 8

Contributions of mortality changes by age and cause^a to the change in life expectancy at birth of Australian females between 1982 and 1992. The contributions shown are hundredths of a year of life^b.

Cause group	Age group							All ages
	0	1-4	5-14	15-29	30-49	50-69	70+	
1	1	0	0	0	0	0	-1	1
2	0	0	0	0	1	-1	-5	-5
3	0	0	0	0	0	2	0	2
4	0	0	0	0	2	8	-2	10
5	0	0	0	0	5	33	36	74
6	0	0	0	0	3	16	46	65
7	0	0	0	0	2	5	26	32
8	1	0	0	0	2	0	-1	2
9	0	0	0	0	2	3	0	5
10	0	0	0	1	0	0	0	1
11	17	0	0	0	0	0	0	18
12	0	2	1	0	0	1	3	6
13	1	2	2	5	2	2	1	13
14	0	0	0	-1	1	2	0	2
15	0	0	0	-1	0	0	0	-2
16	0	0	0	0	0	0	0	-1
17	4	0	0	0	1	5	-5	6
All causes	25	5	2	6	20	75	97	229

^aFor a description of each cause group, see for example Table 2. ^bBecause of rounding, row and column totals may not tally exactly with the totals shown.

Australian life tables 2002

It is interesting to conjecture what the Australian life tables would look like in 2002 if the trends in cause of death which were observed over the decade to 1992 were to continue into the new millennium. Whilst this approach is essentially a form of extrapolation, such an approach to mortality projection has proved as successful as any and better than most other methods (Pollard 1987). From Table 4, it is immediately apparent that the standardized mortality rates for the three circulatory diseases groups fell substantially between 1982 and 1992 for both sexes, but particularly the males. For most cancers, on the other hand, mortality remained stagnant, with only minor changes in the standardized mortality rates.

Table 9

Contributions of mortality differentials by age and cause^a to the sex differential in life expectancy at birth in Australia in 1982. The contributions shown are hundredths of a year of life^b.

Cause group	Age group							All ages
	0	1-4	5-14	15-29	30-49	50-69	70+	
1	0	0	0	0	0	1	1	2
2	0	0	0	0	5	47	32	85
3	0	0	0	0	-12	-22	-8	-43
4	0	0	1	3	4	28	41	77
5	0	0	0	1	26	125	85	238
6	0	0	0	0	1	10	8	19
7	0	0	0	1	4	18	16	39
8	0	0	1	1	1	22	54	80
9	0	0	0	0	4	9	2	15
10	0	0	0	-1	0	0	0	-1
11	10	0	0	0	0	0	0	12
12	0	2	3	15	14	7	2	43
13	0	1	5	38	13	4	2	63
14	0	0	1	13	9	4	2	29
15	0	0	1	2	1	0	0	5
16	0	0	0	0	0	0	0	0
17	8	1	1	3	5	9	13	40
All causes	19	5	14	76	76	263	251	703

^aFor a description of each cause group, see for example Table 2. ^bBecause of rounding, row and column sums may not tally exactly with the totals shown.

Table 10

Contributions of mortality differentials by age and cause^a to the sex differential in life expectancy at birth in Australia in 1992. The contributions shown are hundredths of a year of life^b.

Cause group	Age group							All ages
	0	1-4	5-14	15-29	30-49	50-69	70+	
1	0	0	0	0	1	1	2	4
2	0	0	0	0	4	44	33	81
3	0	0	0	0	-13	-24	-11	-48
4	0	0	0	2	1	39	63	104
5	0	0	0	1	16	79	74	169
6	0	0	0	0	1	6	8	15
7	0	0	0	0	3	14	14	30
8	1	0	0	0	1	12	46	59
9	0	0	0	0	4	9	1	14
10	0	0	0	0	0	0	0	0
11	10	0	0	0	0	0	0	10
12	0	1	2	11	9	5	2	31
13	0	1	2	15	8	2	1	27
14	0	0	0	18	15	7	2	42
15	0	0	0	2	2	1	0	4
16	0	0	0	3	13	2	0	18
17	3	1	0	5	6	8	15	38
All causes	15	1	4	57	68	204	250	599

^aFor a description of each cause group, see for example Table 2. ^bBecause of rounding, row and column sums may not tally exactly with the totals shown.

‘Smoking’ cancers showed some evidence of change with an appreciable decline in male mortality and a substantial increase in female mortality. The ratio of the 1992 standardized rate to the 1982 standardized rate is shown in Table 11 for each of selected causes with the exception of AIDS. It was assumed that the 1992 mortality rates by age and cause should be adjusted with these ratios to project the 2002 mortality rates by age and cause. The ratios of

the standardized rates by cause in 2002 to those in 1992 would then replicate those shown in Table 11. Whilst it could be difficult to maintain the rates of improvement which have been sustained in the recent past, over the next decade, there is little evidence that the pace of change is slackening, and the temptation to make more conservative assumptions was resisted. AIDS-flagged deaths posed a problem. Development of the disease in the community has not been as devastating as originally feared, and its effect on the 1992 life table was relatively minor. For projection purposes, therefore, it was assumed that the age-specific mortality rates for AIDS-flagged deaths would remain unchanged. Life tables and multiple decrement tables under the adjusted mortality regime are readily computed using the Cause Elimination/Reduction/Modification routine of LIFETIME, and the projected abridged life tables for 2002 are shown in Tables 5 and 6 alongside those which pertain to 1982 and 1992. Graphs of the projected q_x curves based on the full projected 2002 life tables are included in Figures 4 and 5, with the corresponding 1982 and 1992 curves. In the case of the males (Figure 4), the 'accident hump', so clearly evident in 1982, and transformed to an 'accident bulge' in 1992, is still very evident as a 'bulge' in 2002. The 1992 and 2002 values shown for ages 18, 19, 20 and 21 need to be treated with some scepticism, due to the five-year data grouping in LIFETIME and the algorithm used over this particular age range, which is specifically designed not to graduate out an 'accident hump'. The true values over the age range 18-21 for 1992 and 2002 are probably a little lower than those depicted, and the graphed age 19 value in 1982 is probably exaggerated slightly. Despite these minor shortcomings, the overall picture is very clear. In the case of the females, the 'bulge' remaining in 2002 is still clearly evident, albeit on a much smaller scale than that of the males. The cautionary note in respect of ages 18-21, given in respect of the male curves, also applies. It would seem that the q_x curve projected for the year 2002 is almost completely flat from about 18 to 24. The probabilities of ultimately dying of the selected causes for the 1982, 1992 and projected 2002 life tables are listed in Table 12. Under the mortality projected for 2002, males are equally likely to die from IHD and 'all other neoplasms', and these two causes together account for almost 50 per cent of deaths. The proportions expected to die from the other major killers ('smoking' neoplasms, cerebrovascular disease, other circulatory disease, and respiratory diseases) are of much lower magnitude. Owing to the marked improvements in mortality projected for some of the major killers, the proportion of males likely to die from 'all other causes' will be much higher than in 1992 or 1982. If deaths from breast cancer are included with 'all other neoplasms', the picture for the females is not dissimilar. Fewer are expected to die from 'smoking' cancers, compared with the males, but rather more from cerebrovascular disease and 'other circulatory diseases'.

Table 11

Australian males and females. Ratio of standardized mortality rate in 1992 to that pertaining to 1982, by cause

Cause group	Males	Females
1 Infect. dis. B1-B7	1.21	1.14
2 'Smoking' neopl. B8-B10	.088	1.22
3 Breast cancer B11.3	1.00	0.97
4 All other neopl. B9 B11-B17 excl. B11.3	1.03	0.97
5 Ischaemic heart dis. B27	0.68	0.75
6 Cerebrovascular dis. B29	0.61	0.59
7 Other circul. B25 B26 B28 and B30	0.69	0.71
8 Respiratory dis. B31-B32	0.72	0.99
9 Cirrhosis B34.7	0.74	0.64
10 Obstetrics B38-B41	1.00	0.31
11 Congen./perinatal B44-B45	0.73	0.72
12 Non-motor accid. B47-B53 excl. B47.1	0.72	0.73
13 Motor accid. B47.1	0.50	0.65
14 Suicide B54	1.13	0.85
15 Other violence B55-B56	1.21	1.49
16 AIDS flagged ^a	-	-
17 All other causes ^b	0.96	1.00

^aRatio is infinite. See text. ^bB18-B24, B33-B37 excluding B34.7, B42-B43, B46

Table 12

Probability of ultimately dying from a particular cause. Australian males and females, 1982, 1992, and projected 2002.

Cause group	Males			Females		
	1982	1992	2002	1982	1992	2002
1	.004	.007	.011	.004	.009	.007
2	.073	.077	.077	.020	.038	.028
3	.000	.000	.000	.032	.036	.034
4	.146	.189	.236	.130	.160	.145
5	.309	.272	.233	.213	.247	.268
6	.103	.085	.069	.181	.103	.139
7	.094	.088	.080	.139	.110	.123
8	.105	.102	.095	.063	.086	.072
9	.011	.009	.007	.005	.003	.004
10 ^a	.000	.000	.000	.0 ³ 2	.0 ⁴ 2	.0 ⁴ 7
11	.010	.007	.005	.008	.004	.006
12	.022	.019	.016	.018	.014	.015
13	.023	.012	.006	.010	.004	.007
14	.014	.016	.019	.005	.004	.005
15	.002	.003	.004	.001	.003	.002
16 ^b	.000	.005	.005	.000	.0 ³ 2	.0 ³ 2
17 ^c	.084	.108	.136	.110	.177	.144
All causes	1.000	1.000	1.000	1.000	1.000	1.000

^aThe female entries are respectively .0002, .00007 and .00002 ^bThe female entries are respectively .000, .0002 and .0002. ^cB18-B24, B33-B37 excluding B34.7, B42-B43, B46.

Figure 4

Mortality $q(x)$ curves of Australian males according to Australian Life Tables (Males) A1932-34, A1953-55, A1970-72, the national experiences of 1982 and 1992, and the projected table for 2002.

Figure 5
Mortality $q(x)$ curves of Australian females according to Australian Life Tables (Females) A1932-34, A1953-55, A1970-72, the national experiences of 1982 and 1992, and the projected table for 2002.

The life expectancy of cohorts

National life tables are always cross-sectional in that they summarize the mortality of the population at a given epoch, by attained age; a single mortality rate is recorded from each cohort, the rate corresponding to the attained age of the cohort, and these rates from all the cohorts are combined in the cross-sectional life table. Since no life will ever be subject to the mortality of a cross-sectional table, such a table must be regarded as an artificial device, albeit useful. To a 70-year old's question: 'What is my life expectancy?', the most recent cross-

sectional table can at best provide an imprecise answer. In a situation of continually improving mortality, the cross-sectional table will provide a lower bound for his or her life expectancy, but that is all. Over the decade 1982 to 1992 and for some years earlier, Australian males and females at the higher ages (over 60, say) have experienced age-specific mortality rates which have improved on average about two per cent per annum (even slightly more for the males 60-80). A male aged 70 in 1992, therefore, would expect to live slightly longer than the 12.18 years quoted for 1992, but probably less than the projected 2002 life expectancy figure for a 70-year old (13.77). On the assumption that mortality at all relevant ages will continue to improve by two per cent per annum, it is possible to produce a special projected life table for the cohort of lives who were aged 70 in 1992, but this is a rather tedious procedure, and separate projected cohort life tables need to be constructed for each cohort. Approximate calculations, however, are readily performed to answer the above question, using a formula based on the Gompertz 'law' of mortality. The results, even for populations not strictly of the Gompertz type, are quite accurate. Where the Gompertz 'law' $\mu_x = B e^{kx}$ is applicable to the cross-sectional table, the cohort force of mortality at age x ($x \geq 70$) for a life aged 70 in the base cross-sectional table, having force of mortality μ_{70} at that time is given by $\mu_{70} = \exp[(k-0.02)(x-70)]$, on the assumption that the force of mortality at all ages will continue to decline continuously at two per cent per annum. The cohort mortality is also of the Gompertz form, but with exponential parameter $k' = k - 0.02$. The accurate approximate method for estimating the cohort expectation of life is based on the exact derivative formula $de^0_x/dk = [1 - (\mu_x + k) e^0_x]/k^2$ (1) which is easily derived using the approach of Pollard (1993). Various methods can be used to determine the Gompertz parameter k when the cross-sectional life table is not strictly of the Gompertz form. The simplest is to note that k is equal to the force of mortality μ_m at the mode of the curve of deaths (Pollard 1991). To select k in practice therefore, all one has to do is find the age y at which the deaths column d_y is a maximum, and set μ_m equal to $(\mu_y + \mu_{y+1})/2$. The expectation of life for a person who is aged x at the date of the cross-sectional table, but who will be subject to cohort mortality which is continuously improving at two per cent per annum is given by the accurate approximation $e^0_x(\text{cohort}) = e^0_x - 0.02 [1 - (\mu_x + \mu_m) e^0_x]/\mu_m^2$. (2) This formula, whilst based on the Gompertz 'law', only involves functions which are available in any life table. In situations where the rate of improvement is 100r per cent per annum, the number 0.02 is simply replaced by the fraction r . Cohort life expectancies for lives in the age range 60 to 90 are shown in Table 13, alongside the cross-sectional source data. As might be expected, the life expectancy of the cohorts around age 60 in 1992 are higher than the projected cross-sectional life expectancies for those ages in 2002, and the converse is true for the older 1992 cohorts.

Table 13
Cross-sectional force of mortality and life expectancy, and projected cohort life expectancy for lives aged x in 1992 ($x=60, \dots, 90$)

Age x	Males			Females		
	Cross-sectional	Cohort		Cross-sectional	Cohort	
	x	e^0_x	e^0_x	x	e^0_x	e^0_x
60	.01139	19.17	21.51	.00616	23.48	26.43
61	.01275	18.39	20.59	.00674	22.63	25.43
62	.01427	17.64	19.72	.00738	21.79	24.44

63	.01588	16.90	18.85	.00810	20.95	23.45
64	.01756	16.17	18.00	.00894	20.13	22.49
65	.01943	15.47	17.18	.00986	19.31	21.53
66	.02148	14.77	16.36	.01087	18.51	20.60
67	.02377	14.10	15.59	.01199	17.71	19.66
68	.02619	13.45	14.84	.01329	16.93	18.76
69	.02877	12.81	14.09	.01481	16.17	17.88
70	.03159	12.18	13.36	.01650	15.41	17.00
71	.03469	11.58	12.67	.01839	14.67	16.14
72	.03809	10.99	11.99	.02049	13.95	15.31
73	.04204	10.41	11.33	.02288	13.25	14.51
74	.04664	9.86	10.71	.02562	12.56	13.72
75	.05174	9.33	10.12	.02868	11.89	12.96
76	.05740	8.83	9.57	.03211	11.24	12.22
77	.06367	8.35	9.04	.03594	10.61	11.50
78	.07021	7.89	8.53	.04030	10.01	10.83
79	.07696	7.46	8.06	.04526	9.42	10.17
80	.08436	7.04	7.59	.05082	8.86	9.54
81	.09246	6.64	7.15	.05707	8.32	8.95
82	.10135	6.27	6.76	.06409	7.81	8.39
83	.11056	5.91	6.36	.07154	7.32	7.84
84	.12001	5.57	5.96	.07938	6.86	7.33
85	.13028	5.25	5.63	.08808	6.41	6.83
86	.14142	4.94	5.29	.09773	5.99	6.37
87	.15362	4.65	4.97	.10843	5.58	5.92
88	.16665	4.37	4.66	.12031	5.20	5.50
89	.18091	4.10	4.37	.13350	4.83	5.10
90	.19638	3.85	4.10	.14812	4.49	4.73

Note. For males, $\mu_m = 0.08841$; for females, $\mu_m = 0.10308$.

Conclusion

Over the century to 1992, expectation of life at birth for Australian males rose from 49.13 years (Moors and Day 1901) to 74.48, an average improvement of a quarter of a year per annum. For females, the corresponding change in life expectancy was from 52.13 years to 80.47, an improvement over the century of about 0.28 years of life per annum. Improvements in mortality have not taken place uniformly over the span of life nor over time. Over the first 60 to 70 years, much of the improvement in life expectancy at birth was the result of reduction in infant and child mortality. Mortality at these ages is now at such a low level that any further contribution to improvement in life expectancy at birth will be trivial. Most of the increase in expectation of life over recent decades has been the result of mortality reduction at the older ages, from 50 onwards (Pollard 1982), and the continuous annual increase has still been remarkable: about 0.23 years of life per annum for females and about 0.33 for males over the decade 1982-1992. Because improvements in mortality have not occurred at a uniform pace in all age groups, the Australian mortality curves have undergone important changes in shape, the most obvious one being the appearance of a distinct 'accident hump' near age 20 and its even more rapid disappearance. The same phenomenon has been observed in the United States of America (Kranzler 1995) and elsewhere, and the explanation appears to be the same: decreased accident mortality in the early twenties and increased mortality due to AIDS around

age 30. Any projection of future mortality is an extrapolation of that observed in the recent past, and a projection in which major causes of death are extrapolated separately appears to be less prone to error than those which simply extrapolate age-specific mortality in aggregate. With rapid improvements in mortality from certain major killers, there is always the temptation to adopt more conservative assumptions for the future. Those who have adopted such conservative assumptions in the past, however, have usually been proved too cautious by time. When mortality rates from major causes are projected separately, some will be proved to have been too low and some too high. To a certain extent therefore, projection errors for the separate causes will counteract each other. The mortality projected for Australia in 2002 envisages an expectation of life at birth of 76.83 for males and 82.11 for females. The 'accident hump', so prominent for the latter part of the twentieth century and which reduced to a 'bulge' around 1990, is expected to decline even further.

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Health transition research in Nigeria in the era of the Structural Adjustment Programme*



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Before the arrival of Europeans in Nigeria, traditional medicine was the only recognized form of indigenous medical practice. The practitioners generally known as traditional healers throughout Africa are of several different kinds: some are herbalists, some bone setters and manipulators, and some dealt with spirits. An important part of their work is diagnosis which is practised by divination rather than by the multiplicity of tests used in scientific medicine (Orley 1980).

In Nigeria, the practitioners of traditional medicine are referred to by indigenous names such as the *adahunse* or *onisehun* or *babalawo* of the Yoruba (Johnson and Johnson 1921), the *gozan* of the Nupe people (Nadel 1942), the *mallam* (religious scholar), *wanzami* (barber-surgeon), *mai magan* (herbalist), *boka* (magician-healer), *masu bori* (spirit possession cult), and *sarguwa* (midwife) of the Hausa (Stock 1983) and the *dibia* of the Igbo (Ecoma 1963).

The advent of the Church Missionary Society in Nigeria in 1850 marked the beginning of modern scientific medicine there (Schram 1970, 1980); and Western scientific medicine came as a further alternative to the several existing indigenous systems of medicine (Orley 1980). The establishment of colonial government, however, meant that the predominant proportion of modern health care was provided by the government, the Christian medical missions, and a small proportion of independent private medical practice (Lucas 1980).

The advent of the African syncretic churches which possibly now account for nearly one-half of all Christians in southern Nigeria, led to the emergence of faith-healing Christian churches. Thus there are three distinct kinds of health care providers: modern health care providers, traditional health care providers and faith-healers. Their services are often sought concurrently and sequentially depending on the nature of illness.

* Paper prepared for the Seminar on The Continuing Demographic Transition, held at Academy of Sciences, Canberra, 14-17 August 1995.

The Nigerian Health Transition research program was funded by the Rockefeller Foundation. It has drawn upon the resources of the Health Transition Centre, Australian National University; the Nigerian Institute of Social and Economic Research (NISER), Ibadan; and Ondo State University, Ado-Ekiti. Funding for the 1993/94 Ekiti Health Research was from the National Centre for Development Studies and the Health Transition Centre, both of the Australian National University, Canberra.

The distribution of medical care and curative health services during the colonial era, as well as at independence, was uneven with heavy concentrations in the capital and in large

urban centres to the detriment of the rural areas where the majority of the people live (Orubuloye and Caldwell 1975; Lucas 1980; Orubuloye and Oyeneye 1982).

During the colonial time and shortly after independence most government hospitals provided special facilities for civil servants, while the Christian medical missions provided hospital and community care for the most needy; and their programs were sometimes linked to their more vigorous activities in education (Lucas 1980).

Nevertheless, since 1946, health planning has featured prominently in all the National Development Plans in Nigeria. The major aims of the various pre- and post-independence plans were the provision of adequate pure water for everyone, progressive building of environmental hygiene, and the expansion of hospitals, maternity, and child welfare and dispensary services, coupled with rigorous campaigns of preventive medicine in the field (Nigeria 1940-56; 1962-68; 1970-74; 1975-80; 1981-85). In keeping with the philosophies adopted by the various pre- and post-independence plans, modern health facilities were expanded and treatment at public health facilities was until 1984 free for those under 18, all government workers and their families; and highly subsidized for the rest of the population.

The modern health system in rural Nigeria is largely a governmental one, with a health centre or small hospital in the Local Government Area Headquarters, staffed by at least one trained doctor as well as nurses and a compounder. In the nearest large town there is likely to be a larger government hospital as well as a number of private doctors and clinics (Orubuloye, Caldwell and Caldwell 1991:197). Nearly all the university towns have at least a specialist hospital or a teaching hospital supported by grants from the federal or state governments. The prosperous oil boom years which began shortly after the end of the Nigerian civil war in 1970 coincided with a rapid expansion in the health facilities, as well as in the educational and other social services. Every bed in government hospitals was filled, and there were long queues at the Out-patient departments. The period was one of rapid decline in infant and childhood mortality associated primarily with the provision of health facilities and expansion in female education (Orubuloye and Caldwell 1975; Caldwell 1979).

Social science health research in Nigeria in the 1970s and 1980s

Partly because of the existence of several systems of health care side by side, and the apparent uneven distribution of modern health facilities in Nigeria, much of the earlier social science health researchers in the 1970s and 1980s concentrated on health attitudes and treatment systems adopted: modern medicine, traditional healers, home remedies or faith-healing churches; or on the degree of access to health facilities (Caldwell 1994). One of the pioneering efforts was the research conducted in 1974 by Orubuloye under the supervision of J.C. Caldwell in southwest Nigeria on the effect of public health services on child mortality (Orubuloye 1974). The research showed that, when modern health facilities were available, most people used them; and there were significant differences by education of mothers and use of such services on the one hand, and child mortality on the other (Orubuloye and Caldwell 1975). The research also showed that modern medicines bought from chemists, patent medicine stores, and hawkers were also widely used. Several other subsequent studies such as that of Egunjobi (1983) in northern Oyo; Stock (1983) in Hadejia in northern Nigeria; Okafor (1984) in rural Bendel state; and Adedoyin and Watts (1989) in an indigenous area of the city of Ilorin confirmed the effects of accessibility and ability to pay in greater use of modern health facilities and improvement in health conditions. The cultural context of the decisions to use modern or traditional treatment also received a great deal of attention.

A 1974 study of the determinants of pattern and degree of use of health services in Western State, Nigeria, showed that in Okitipupa, 26 per cent of treatment took place in the traditional sector (herbalists, spiritualists, *mallam*), 57 per cent in the modern sector (hospital, health centre, dispensary clinic, maternity, chemist), 5 per cent either traditional or modern

(hawkers, herbal stores) and 12 per cent was self treatment (Ademuwagun 1977:899). The characteristics of patients in spiritual healing homes and of traditional doctors, and the factors which influenced their choice of health care providers, were examined as a response to their growing importance in the Nigerian health care system (Uyanga 1979).

The various stages involved in health-seeking were also studied (Igun 1979), while the response of parents to childhood diseases in a Nigerian Yoruba community has recently been studied by Adetunji (1991) who showed that mothers used alternative sources of health care rather than hospitals, clinics and maternity centres, in their treatment of diseases among children. The alternative sources were patent medicine stores where there were personal relationships between the customers and the owners of the medical stores, free consultancy and flexible pricing.

Adetunji (1991) also showed that parents' location, access to good advisers, the perceived seriousness of the sickness and religious beliefs of mothers were important determinants of their responses, while avoidance of blame was a major motivating force in parents' search for potential sources of health care. The study was undertaken in late 1988 and early 1989, when the structural adjustment program (SAP) had been in place for about three years, and the effect on health treatment was gradually becoming apparent.

The destabilization of the health care system

Nigerian society has changed from what it was during the oil boom years of the 1970s; the greatest changes have occurred in the area of health care. The charging for health services from 1984 is a major departure from the welfare philosophies of the pre- and post-independence eras. The collapse of high export prices for petroleum, which accounts for 95 per cent of the nation's gross national product, and the introduction of SAP, the economic structural adjustment adopted to meet the difficulties created by the end of the oil boom, are important changes in recent times. The Nigerian currency unit, the Naira, was worth US\$1 before the 1987 float, but has now sunk to an all-time low value of US 25 cents. The floating of the Naira compounded the economic problem and made treatment compete with other personal and family costs as the cost of medicine rose sharply with other prices. In the first five years of the structural adjustment program, 1986-1990, government allocation of resources to the health sector ranged from just US 42 cents to US 62 cents per capita, an amount which was grossly inadequate to treat an attack of malaria (Popoola 1993), or a mere 1.6 to 1.9 per cent of the total federal government expenditure during 1980-90. The rising cost of health services and the imposition of user charges and fees where none previously existed have received the attention of other scholars in the health field (see Dennis 1992; Ogbu and Gallagher 1992).

Most government hospitals were almost deserted, as the number of people attending them dwindled rapidly, partly because of the expense of treatment caused by imposition of charges for government health services and a move towards selling prescribed medicines at market prices, and partly because most government hospitals have been reduced to mere consulting clinics for lack of equipment and drugs. Many patients were attempting home cures or had turned to the traditional medical system or to the faith-healing churches (Orubuloye, Caldwell and Caldwell 1991).

Although infant and childhood mortality has declined over the years, the current economic difficulties and the progressive deterioration of the health care system may have put a stop to the continuing decline in the levels of infant and childhood mortality. A comparison of child survival estimates from the 1986 Ondo State DHS and the southwest component of the 1990 Nigerian DHS suggests a significant rise in mortality (Orubuloye 1994). Similarly, a comparison of the 1992 and 1994 UNICEF reports on the *State of the World's Children* showed that infant mortality in Nigeria rose from 104 per thousand in 1988 (two years after

the introduction of SAP) to 114 per thousand in 1992, while childhood mortality rose from 174 per thousand to 191 per thousand during the same period (UNICEF 1992, 1994).

The collapse of the government health care system has increased the proliferation of private medical practice and the establishment of private hospitals and clinics. Most of the private hospitals and clinics charge exorbitant prices, while some adopt a flexible pricing system that enables low income earners to benefit from the services they provide. One such private hospital is the Lifeline Children's Hospital in Surulere (which means 'patient pays'), Lagos, established in January 1994. According to the Associated Press report of 21 November 1994, the events that led to the establishment of the Lifeline Children's Hospital are as follows:

when it became too painful to watch youngsters dying in government hospitals for lack of medicine and equipment, four women doctors from Lagos University Teaching Hospital (LUTH) bucked the system and opened Nigeria's first private hospital for children. Their achievement is one of the few bright spots in a nation suffering from the greatest economic and political crisis in decades

The report continued:

a stream of patients flowed through the 20-bed hospital and consulting rooms during a recent evening and a mother remarked: 'although treatment was expensive ... taking the kids to the government hospitals is like giving them the death sentence'. When one of the consultants was talking to the press, a nurse came in to report that a mother had no money for medicine. The consultant replied 'Heavens the child needs it, give it (the medicine) to the mother and tell her to bring the money next week'.

According to the report, a bed at Lifeline Children's Hospital costs 400 Naira or US\$18 per night, about one-third of the monthly salary of the lowest-paid government worker. The above is an example of the frustration for most poor people since the introduction of the 'user pays' principle to the health care sector and the collapse of the exchange rate in 1987.

In realization of the collapse of the health care systems, the federal government recently proposed a National Health Insurance Scheme as a complementary source of financing the health services. In a recent public statement by the government, it was emphasized that 'it has become obvious that there was a great advantage in making the public to pay a little premium against the rainy days to ensure that the health services were readily available and acceptable' (*West Africa* 1994:874).

The study of who makes treatment decisions and bears the cost was of particular importance both for the understanding of the influences on morbidity and mortality, and for suggesting interventions that would ease the most acute difficulties at a time when the cost of treatment had become more difficult for many families to meet than had been the case for a generation (Orubuloye, Caldwell and Caldwell 1991).

The Nigerian Health Transition research program

Consequent upon the establishment of an exploratory program by the Rockefeller Foundation in 1987 to examine the state of knowledge on the cultural, social and behavioural determinants of health, and the subsequent International Workshop held in Canberra in May 1989, the Nigerian Health Transition research program was initiated in 1990. The objectives of the program include the understanding of the cultural, social and behavioural determinants of health, and the part played by these factors in the achievement of lower levels of mortality and improved conditions of health. The outcome of the research program is to assist in policy formulation and the development of intervention programs that will lead the health seekers

and the community toward appropriate health-seeking behaviour that will promote good health for all by the end of the 1990s.

The initial program was conceived by senior officers of the Health Services Division of the Rockefeller Foundation, while the Nigerian program was developed and co-ordinated by I.O. Orubuloye. John Caldwell acted as adviser and technical support was received from the Health Transition Centre, National Centre for Epidemiology and Population Health, Australian National University. Funding of the Nigerian program was provided by the Rockefeller Foundation. Although the research program is based at the Nigerian Institute of Social and Economic Research (NISER), Ibadan, it is being executed by 20 researchers drawn from 11 universities and research institutions across Nigeria.

As a prelude to the larger program funded by the Rockefeller Foundation, a pilot study funded by the Australian National University was undertaken in late 1990 in a single village in Ekiti district of southwest Nigeria. The research was conceived as a pilot study to guide the major program, by developing appropriate research methodology and instruments for the main research program. The research showed that most child health treatment was paid for by one person only, usually a parent, and that the treatment chosen was decided by the person meeting the cost. The research also demonstrated that mothers were likely to pay for minor illness, either for themselves or their children, but the father's role became more important as the cost rose (see Orubuloye, Caldwell and Caldwell 1991). A number of intervention strategies that are likely to ease the problem of delay in seeking treatment were suggested.

The larger survey was planned to take place in three stages. The first stage undertaken in September–October 1992 consisted of a household survey and a retrospective survey of all women 15–59 years old with at least one surviving child under 15 years of age in each household. The second and third stages designed as follow-up to the first one were scheduled for March–April 1993 and September–October 1993. The first stage was successfully executed in ten out of the 21 states existing in Nigeria as at 1991. The political crisis following the annulment of the 1993 elections made it difficult and dangerous for the continuation of the field survey in all the states. The research described here is therefore, the first stage of the Ondo State segment of the Nigerian program. A similar survey on Family Structure and Treatment of Child Illness in Ekiti District, Nigeria was also conducted between April 1993 and February 1994. The result is presented separately in this paper.

The 1992 Ondo State health transition research

Ondo State was carved out of the former Western State of Nigeria in 1976. The state is located in the southwestern part of Nigeria. It has a land area of about 20,595 square kilometres and a population of 3,884,485 (1991 census); it comprises 26 local government areas. The area consists of lowlands in the south and rugged hills in the northernmost part. It lies within the tropics with two distinct seasons, rainy and dry.

Ondo State is predominantly Yoruba and resembles the rest of the Yoruba region. Although there are various distinct dialect groups in the state, the people have basically the same way of life. The dominant religion is Christianity with strong and visible African syncretic churches. Most women devote much of their time to trading, while farming is the dominant traditional occupation of the men.

Although there are few industrial establishments in the state, Ondo State is proud of its educational achievements and the importance its people attach to education. Nearly all children have access to primary and secondary education, and the establishment of two universities in the state, in recent years, has increased the opportunities for university education. However, the measures instituted from the beginning of 1984 and the charging of fees recently introduced in the secondary schools have led to a rapid decline in school enrolments. There are 729 health institutions owned by the government, religious and private

organizations: four specialist hospitals, 72 general hospitals, 144 health centres, 261 maternity centres, and 242 dispensaries. Each of the 26 administrative areas has at least one general hospital and a number of health centres, maternity centres and dispensaries. Medical services were free at all government health facilities for children under 18 until 1983. Since 1984 charges for health services have been established in all government health institutions. The huge change in the exchange rate since 1987 increased the burden of health care services on many families.

The sample for the Ondo State study was taken from Ondo Town and from six of its satellite villages. Ondo Town is one of the major urban centres in Ondo State, with a population of about a quarter of a million. It is a nodal point of main roads, a commercial centre, a place of small industries, many related to the timber and cocoa industries, and an important educational centre (Orubuloye, Caldwell and Caldwell 1992). Ondo Town has a specialist hospital, about a dozen private hospitals and clinics, and a high density of chemist and patent medicine stores. For the rural component of the study six villages were selected; they are inhabited by Ondo people who had migrated there as cocoa farmers and timber producers. Although the people reside permanently in the villages, they maintain a close relationship with Ondo Town, visiting it regularly and on major festival occasions. Each of the villages has a health centre or dispensary staffed by at least a trained nurse or midwife and a compounder. In addition, the villages are visited by hawkers of modern pharmaceuticals. Traditional practitioners also abound. A survey of household facilities showed a general poor condition of water supply and toilet facilities even in Ondo Town where only six per cent had piped water connected to their houses while another five per cent fetched piped water from public taps; the majority depended on well water which was hardly treated.

Ondo Town was divided into five clusters, and in each cluster an interviewing path was determined that passed every house. Houses along the route were chosen on alternate sides with a fixed sampling fraction of 50 houses in each cluster. In each house, all households with women 15-59 years of age with at least one surviving child under 15 years of age were interviewed. The sampling strategy yielded 255 interviews from 210 households in Ondo Town. In the rural areas, all the houses were visited, and 286 women 15-59 years of age with at least one surviving child under 15 years of age were interviewed from 242 households. The survey was limited to Yoruba women, in keeping with the basic objective of showing the differences or similarities in illness behaviour and the treatment of illness among the various ethnic and cultural groups in Nigeria. Most of the interviews in Ondo Town and the villages were carried out late in the afternoon when most of the women had returned from trading or farming. However, women traders who sell their wares in and around their houses were interviewed in mid-morning or mid-afternoon.

Co-operation was enhanced first by making sure that most of our interviewers and supervisors were from Ondo and spoke the Ondo dialect fluently, and had worked with us in an earlier survey in Ondo Town (Orubuloye et al. 1992). Co-operation was reinforced by seeking permission from the quarter High Chiefs in Ondo Town and the village heads.

The survey findings

The population

The characteristics of the population are summarized in Table 1. The age structures of both the urban and the rural population were similar; slightly more than one-half were under 35 years of age. In Ondo Town only three per cent reported that they were 50 years old and above, and no respondent in the rural areas was found in this group. Given the age structure of the population, the proportion of women under 35 years of age suggests that the level of

fertility was high, and that reproduction started early, and tended to extend for a considerable length of the women's reproductive life-span. Christianity was the dominant religion, with African syncretic churches accounting for 54 per cent of the Christian population in Ondo Town and 49 per cent in the rural areas. There was also a strong Muslim community in the rural areas, and a small proportion of adherents to traditional religion as well. It was a well educated community by Ondo State standards. About two-thirds of Ondo Town respondents and about one-half of the rural ones had some formal education. Of the urban respondents 39 per cent had at least some secondary education, as did 20 per cent of the rural respondents. Farming and trading were the dominant occupations in the rural areas, most of it related to the cocoa and timber industries. The majority of the urban respondents were traders in imported and locally produced goods. Those in white-collar occupations worked mainly in government and private offices in the town.

Marriage was still largely universal and stable, and tended to be polygynous. The majority of women were still in their first marriages, while 70 per cent of urban and 77 per cent rural women were first wives of their husbands. There was no evidence that polygyny is on the decline; what appears to be on the decline is its intensity, with only a few polygynists now having more than two wives.

There was evidence that an increasing number of women were pooling their resources with their husbands. This appears to be a recent phenomenon, as confirmed by a more recent study in the Ekiti District (Oni 1994). However, there was no significant difference between the urban and the rural areas on one hand, and between the young and educated, and the old and uneducated on the other. This is a major change. In West Africa, and indeed among the Yoruba, most women have their own budgets, control resources and make decisions based on these resources (Orubuloye et al. 1991). The change is probably a product of the collapse of high export prices for petroleum and the economic program adopted to meet the difficulties created by the end of the oil boom.

The charging for health treatments from 1984 affected the whole population and made treatment compete with other personal and family costs. The floating of the Naira in 1987 compounded the economic problem and the cost of medicine rose sharply with other prices. It has therefore become inevitable for families to pool their resources to meet their basic needs.

TABLE 1
Characteristics of population (percentage distribution)

Characteristics	Subgroup	Urban (N=255)	Rural (N=286)
Age	15-34	51	54
	35-49	46	46
	50-59	3	0
	Median age	34	33
Education	No formal schooling	28	49
	Primary only	31	30
	Secondary only	39	20
	Above secondary	3	a
Occupation	Farming	8	47
	Trading	71	47
	Artisan	9	1
	Teaching	3	1

	White collar	8	1
	Other (at school, unemployed)	3	a
Religion	Christianity:		
	- Catholic	18	20
	- Protestant	24	25
	- Other Christians	49	43
	Islam	8	11
	Traditional	1	1
	None	a	0
Marital Status	Currently married	93	96
	Divorced /separated	6	3
	Widowed	2	1
Type of union	Monogamy	64	66
	Polygyny	36	34
Position among husband's wives	First	90	96
	Second	7	4
	Third and above	3	-
Pooling of resources with husband	Yes	35	44
	No	66	56

^a less than one per cent

In Ondo Town, 92 per cent of all currently married women were living in the same house or compound with their husbands, and the proportion for the rural areas was 96 per cent. This is important for understanding how treatment decisions were made and costs of treatment met. The data on fertility indicate that fertility was high. Although there was the evidence of an onset of fertility decline in the region (Caldwell, Orubuloye and Caldwell 1992; Orubuloye 1994), there was virtually no restriction of births by contraception. Child mortality was high, at about the same level recorded in another survey in the region by Orubuloye, Caldwell and Caldwell (1991). There was evidence here and from other studies (Orubuloye 1994), that mortality may be rising because of the current economic difficulties.

Child fostering was typical of the Yoruba pattern. In Ondo Town, about the same proportions of children were fostered in and fostered out, while the rural areas sent out more than they received. The majority of children were fostered by relatives for the purpose of education or for learning a trade, and because it conformed with traditional custom and practice.

Individual women's most recent illness

Respondents were asked to indicate the type of illnesses which they had suffered during the month preceding the survey, the duration of the illness, the person who decided on treatment, where treatment was received, the cost of treatment and the person or persons who paid for the treatment. Ninety-five per cent of Ondo Town women and 94 per cent of the rural women

reported some type of illness. There were also close similarities in the types of illnesses reported. Fever (malaria) accounted for slightly more than one-half of all illnesses reported, while body pains accounted for another one-third of all cases. Dysentery was reported by about five per cent while skin diseases accounted for another four per cent. Sixty-six per cent of the Ondo Town women reported that the illnesses lasted up to three days; the corresponding proportion for the rural areas was 69 per cent. Only nine per cent of the women in both the urban and the rural areas reported that the illnesses lasted for more than one week.

The existence of several distinct therapeutic systems in a single cultural setting has been viewed as an important feature of medical care in the developing world (Leslie 1978). Generally, care is sought from several types of providers concurrently or sequentially, and the various types of care are often seen as complementary rather than conflicting (Christakis, Ware and Kleinman 1994). In Nigeria, there are several types of health care providers: traditional practitioners, mostly commonly herbalists and *mallam*; practitioners of modern medicine; and faith-healing Christian churches. In addition, medicines are procured from chemists and modern pharmaceutical stores, and hawkers.

In order to assess the extent to which respondents shifted from one type of health care provided to another, we asked them to indicate the various choices made during the illness which occurred during the month preceding the survey. The responses are shown in Table 2.

Certainly, there was an understatement of faith-healing, probably because of the tendency for people to seek care from one or two health care providers concurrently. Two points are clear from Table 2: a tendency for health seekers to shift from one type of health care provider to another as the illness progressed; and distinct patterns of health-seeking behaviour differing between the urban and the rural women. The proportion of urban women using modern health care providers increased as the illness progressed. The situation was not consistent among the rural women, where a major shift occurred between the various choices. Although more rural women than urban women patronized chemist or patent medicine stores, the proportion for both urban and rural women also increased as the illness progressed. However, most rural women probably bought their medicines from hawkers.

TABLE 2
Choice of health care provider for respondents during the month preceding investigation
(percentage distribution)

Health care provider	Urban			Rural		
	1st (N=241)	2nd (N=138)	3rd (N=108)	1st (N=268)	2nd (N=131)	3rd (N=95)
	%	%	%	%	%	%
Home - traditional	20	8	3	13	8	6
Home - modern	27	28	9	14	18	10
Private hospital/clinic	11	14	18	10	15	17
Government hospital / health centre	38	33	53	55	28	34
Faith healing	1	1	1	2	2	1
Chemist/medical stores	4	16	16	6	30	33
% using modern health care providers	49	47	72	65	33	51
% of all home or self treatments ^a	48	37	13	29	38	17
% using chemist/medical stores	4	16	16	6	30	33

^a including faith-healing

The pattern observed among the rural population is not unrelated to the cost of treatment. As illness progresses the cost becomes prohibitive for much of the rural population primarily because the services are usually not available nearby. Nevertheless, the pattern conforms with what was believed to be a general pattern of Yoruba treatment decisions. According to Maclean (1976) there are always choices to be made between treatment and non-treatment, between treatment now and waiting to see what happens, between self-treatment and treatment by one or another medical expert.

Now that the costs of treatment are prohibitive, the person who decided on where treatment was received is important for the understanding of how treatment costs are met. Table 3 shows a comparison between the person who decided where treatment was received and who paid the cost. For the urban population, there was a close relationship between decision-making on treatment choice and meeting the cost. Although there was a minor shift among the rural women, there was a distinct pattern between the rural and the urban women. The association between paying for women's treatment and deciding upon it showed that there was a close relationship between making the treatment decision and paying for it. However, more relatives assisted the women in Ondo Town when treatment decisions were taken by the women, whereas in the rural areas, more relatives assisted the husbands when treatment decisions were taken by the husbands.

The average cost of treatment was about 60 Naira (US\$3.33 at the time of survey). The cost was substantial, given the low wages and the sharply rising costs of housing, food, transport, education and other basic needs. Although husbands met a substantial part of treatment cost, more urban women than rural women paid for their treatment. When the cost was high, support was sought from relatives as well.

TABLE 3
Decision on where treatment was received and payment for treatment costs (percentage distribution)

Person who decided on or paid for treatment	Urban		Rural	
	Person who decided (N=241)	Person who paid (N=241)	Person who decided (N=268)	Person who paid (N=260)
	%	%	%	%
Husband	52	52	72	66
Woman	25	22	13	10
Jointly	20	22	14	22
Others ^a	3	4	1	2

^a including husband's parents and own parents and older siblings

The findings emerging from this study differ from the exploratory survey conducted in Ekiti village two years earlier (see Orubuloye, Caldwell and Caldwell 1991). The cost of health treatment has risen greatly since the exploratory survey was undertaken. Many women are finding it increasingly difficult to meet the cost of their treatment. The situation is worse in the rural areas where real income has depreciated because of the rapid decline in the value of the Naira.

Child's illness during the month preceding the investigation

The purpose of the study was to examine whether there would be substantial differences between reports on the respondents' own illnesses and those of their children. Hence, the same questions posed about the respondents' own illnesses were asked about their children's illnesses. Of respondents in Ondo Town 91 per cent reported one type of illness or another in respect of their children during the month preceding the survey, compared with 85 per cent in the rural areas. The patterns of illness in the urban and rural areas were similar but differed slightly from the pattern reported for the respondent's own illness. Fever (malaria) reported by about three-quarters led the list, while dysentery reported by about one-tenth was next. The incidence of measles, chickenpox and whooping cough was astonishingly low probably because of the nationwide immunization program that was successfully carried out in Ondo State shortly before the introduction of SAP. As in the case of the respondents' own illness, the majority of the children's illnesses lasted for a few days. Less than ten per cent persisted beyond one week; and five per cent in Ondo Town and seven per cent in the rural areas reported that the child was currently ill.

The distribution of where treatment was received was closer between the experience of the mothers and that of their children on one hand, and between the rural and urban areas on the other. As indicated in Table 4 the shift was also between home or self treatment and hospital treatment or buying medicine from the chemist or hawkers.

The association between paying for child's treatment and deciding upon it showed that there were no differences between the person deciding on and meeting the cost for the mothers' treatment and the treatment of their children. When the husband decided upon treatment he met the cost. Similarly, when the mother decided, she paid for it.

TABLE 4
Choice of health care provided for child's illness during month preceding survey

Health care provider	Urban			Rural		
	1st (N=448)	2nd (N=287)	3rd (N=233)	1st (N=496)	2nd (N=271)	3rd (N=204)
	%	%	%	%	%	%
Home-traditional	27	5	1	19	4	4
Home-modern	21	31	8	12	25	7
Private-hospital	12	13	20	12	14	21
Government hospital / health centre	38	42	60	54	31	46
Faith-healing	a	a	2	a	1	1
Chemist/medical stores	1	10	9	3	25	21
% using modern health care providers	50	55	80	66	45	67
% of all home or self treatment ^b	49	37	11	32	30	12
% using chemist or medical stores	1	10	9	3	25	21

a less than one per cent

b including faith-healing

However, the association between cost of child's treatment and the person meeting the cost was statistically highly significant for both Ondo Town and the rural areas. Nevertheless, in Ondo Town more women paid fully for their child's treatment than in the rural areas, where

more women made joint contribution with their spouses in meeting their children's treatment costs. The current economic difficulties and the rising cost of health treatment appear to have placed more of the health care burden on the husbands than had been the case in the past. The help which was traditionally received from relatives is apparently on the decline.

Experience with health care providers

The inadequacy and unreliability of the modern health services are some of the major constraints to their use in many developing countries. Patients are usually not given enough time to present their case to the health care provider. A typical encounter between patient and health professional may last less than two minutes (Reid 1984), while descriptions of symptoms may be limited to a single sentence, and physical or laboratory examinations may be cursory or even non-existent (Christakis et al. 1994).

Educational attainment has been found to be positively related to more frequent use of Western-type health care givers (Okafor 1984). Similarly, educated mothers have been found to experience lower child mortality partly because of their ability to negotiate better health treatment conditions with the health professionals (Orubuloye and Caldwell 1975; Caldwell 1979).

Previous experience of persons seeking treatment from the care-givers may influence the decision to delay treatment or use a particular health professional at the onset of another illness. Respondents were therefore asked to recall a typical experience with health care providers in a recent time when they sought treatment for themselves or their own children and other children from a government hospital or a health centre. They were asked to indicate the length of time they stayed with the doctors or nurses, whether they were given medicine, whether they understood the instructions, whether the medicine worked, and whether they went back to tell the staff the outcome of the treatment. The responses are analysed here.

Respondent's treatment

Ninety-six per cent of the respondents in the urban area, and 88 per cent of those in the rural areas were able to recall a typical encounter between themselves and health professionals relating to their own treatment. The duration of the encounter according to the educational status of the respondents showed that there were significant differences between the responses of the respondents in the rural areas and the urban area. Of the respondents in the urban area, 53 per cent spent less than ten minutes with health care providers, while 41 per cent spent more than ten minutes. The corresponding figures for the rural areas are 47 and 60 per cent. However, there were no significant differences between the various educational groups in the rural areas, while there were significant differences between those of the urban area.

Contrary to expectation, it appears that, on the whole, the less educated respondents spent more time with the health care providers than the educated ones. Two factors could be responsible for the pattern observed here. The educated women are far more likely to be precise and to give an accurate description of the symptoms of their illnesses, while more time may be needed by the health care providers to elicit information from the less educated women. It is also possible that the less educated women were not precise about the duration of the encounter thus leading to an overestimation on their part. In addition, the dwindling number of patients in government hospitals may have made it possible for the health care providers to devote more time to their patients than had been the case in the past when there were long queues.

Ninety per cent of the respondents in the rural areas reported that they were given medicine compared to 72 per cent in the urban areas. The difference was statistically significant. Surprisingly, 98 per cent of the rural respondents compared to 83 per cent of the

urban ones reported that they understood the instructions. The difference was also statistically significant. However, there were no significant differences in understanding the instructions among the various educational groups in both the urban and the rural areas. Nearly all the respondents reported that the medicine worked: 99 per cent in the urban areas and 96 per cent in the rural areas. However, 36 per cent of the urban respondents and 45 per cent of the rural ones went back to report the outcome of the treatment to the health care providers. The majority of the respondents who did not go back to see the health professionals acted so because they had fully recovered from the illness or because the health care providers did not advise them to come back. However, there were significant differences between the responses of the respondents in the urban area and those of the rural areas. Many of the respondents in the urban area did not go back to see the health care providers because they had fully recovered from the illness, while the majority of those in the rural areas did not go back because they were not advised to come back.

Own child's treatment

The distribution of the duration of the mothers' encounter with health care providers for their children's treatment was similar to that of the mother's treatment. While the differences between the education groups in the urban area were statistically significant, no significant differences were observed between the education groups in the rural areas.

Of the mothers in the urban area 73 per cent were given medicine for their children's illnesses compared to 90 per cent of the mothers in the rural areas. Although the percentage of educated mothers who were given medicine was slightly higher in the urban areas, the difference was not statistically significant. As in the case of mothers' treatment, the majority of the respondents in both the urban and the rural areas reported that they understood the instructions, and there were no differences between the various educational groups. Nearly all the respondents reported that the medicine given to their children worked. However, 48 per cent of mothers in the rural areas, and 35 per cent of those in the urban area went back to report the outcome of the treatment to the health professionals. Again, for the majority of mothers who did not go back it was because their children had fully recovered from the illness or because they had not been advised to come back. The reason for the majority of the mothers in the urban area not returning to the health care providers was that their children had fully recovered; the reason in the rural areas was that the health care providers did not advise them to return. The difference between the urban and the rural mothers was statistically significant.

Other children's treatment

A total of 33 respondents (22 urban and 11 rural) reported that they encountered health professionals in relation to other children's treatment. Fourteen out of the 22 respondents in the urban area compared to four out of the eleven respondents in the rural areas reported that they stayed with the doctor or nurse for less than ten minutes. The remainder stayed for ten or more minutes. There were no differences between the various educational groups. As in the case of the respondents' own children, the majority of the other children were also given medicine by the health care providers. Again, nearly all the respondents reported that they understood the instructions. Twenty-one out of the 22 respondents in the urban area compared to 9 out of 11 in the rural areas reported that the medicine worked for the other children. However, only two respondents in the rural areas and nine in the urban area went back to report the outcome of the treatment, mostly because the children had fully recovered or because they had not been advised to return. Only two out of the respondents in the urban area who did not report back sought treatment elsewhere.

The number of foster-children involved in the 1992 Ondo study is too small to establish a case for any preferential treatment between the biological offspring of mothers and foster children. This has been reported in the 1993/94 Health Research in the Ekiti District.

The 1993/94 health research in the Ekiti District

The data used in this section of the paper were collected in six communities (two semi-urban and four rural) in the Ekiti District of Ondo State, between April 1993 and February 1994. A total sample of 1538 Yoruba households were covered in the quantitative survey which generated information on household responses to various child illnesses. In each of the six communities, four clusters were randomly selected, from which dwelling units were selected on a systematic basis until a quota for each cluster was reached. One household with one currently married woman of child-bearing age 15-49 years with at least one surviving child under 15 years of age was selected for interview. The survey was limited to one household in each dwelling unit so as to cover a large number of families in the communities.

The first section of the questionnaire was on household listing. Questions were also asked of the respondents on the most recent illness that occurred to all children living in their households. The questions covered type of illness, the symptoms noticed, the person who first noticed the symptom, the duration between awareness of child illness and seeking treatment, the person who decided on where to seek medical help, and the person or persons who paid for the treatment. Questions were also asked on how respondent shifted from one type of health care providers to another in the course of illness.

In addition to the quantitative survey, seven focus-group discussions were held: six for all mothers with at least one surviving child, and one for the fathers. Data generated from the focus-group discussions and the in-depth interviews were used to support the findings from the quantitative data. The focus-group discussions were on the perception of illnesses, the understanding of the causes of illnesses and health behaviour associated with treatment within the households. The results of the quantitative survey are presented here.

Table 5
The characteristics of the population

Characteristics	Subgroups	Semi-Urban		Rural	
		N=727	%	N=811	%
Age	15-34 years	40		56	
	35 + years	60		44	
Education	No schooling	9		13	
	Primary	16		31	
	Secondary	39		38	
	Above secondary	36		19	
Occupation	Trading	38		51	
	Farming	12		12	
	Civil Servant	31		18	
	Artisan	7		12	
	Housewife only	6		3	
	Students	6		4	
	Currently in union	88		89	
Marital status	Divorced /separated	7		8	
	Widowed	4		3	
	Christianity:				

	-Protestants	29	34
	- Catholics	18	23
	-African churches	43	32
	Islam	7	10
	Traditional	2	0
	None	1	1
Type of union	Monogamous	78	62
	Polygynous	22	38
Position among husband's wives	First	36	73
	Second	22	38
	Third and above	3	8
Pooling of resources	Yes	27	25
Husband and wife living together	Yes	79	76
Child fostering	In	7	9
	Out	13	24

The population

Table 5 presents a summary of the characteristics of the respondents. A majority of the semi-urban women were in their late thirties, while those in the rural areas were considerably younger. The educational distribution is typical of the general pattern in Ondo State and that of the Ekiti District in particular. Most women under 50 years now have some schooling, and most of the younger women some secondary schooling. Christianity was the dominant religion, with the African Christian churches now accounting for almost one-half of all Christians. This is a major change, and the result of a major conversion in recent years.

As in the rest of Ondo, farming and trading were the major occupations. A significant proportion were reported as civil servants, mostly teachers, administrators, clerks and nurses who worked in the local government headquarters. Marriage was nearly universal, stable with between one-fifth and two-fifths currently in polygynous unions. Between three-quarters and four-fifths were currently living with their spouses, while about one-quarter were pooling resources with their husbands. Pooling of resources with husbands on the scale reported in the Ekiti study, as in the Ondo survey, is new and not unrelated to the current economic difficulties. The fertility and child survival patterns were similar to those reported for the Ondo survey. The mean number of children ever-born was 3.9 for the semi-urban and 3.7 for the rural areas. These figures are comparable to that of 3.7 reported for Ondo Town and 4.0 reported for the rural areas in the Ondo survey. The mean number of children reported dead was 0.4 for the semi-urban areas and 0.5 for the rural areas. Again, the figures are comparable to 0.4 reported for Ondo Town and 0.5 reported for rural Ondo.

The pattern of child fostering is typical of the district in particular and of the Yoruba in general, with more children fostered out than fostered in. Approximately 11 per cent of the semi-urban women and 14 per cent of the rural ones were reported as heads of their households. Although the majority of the women in this group were currently married and their husbands living elsewhere, the mere reporting themselves as the heads of their households is significant. It is a manifestation of the increasing role of women in the management of the household economy.

Case studies of children's most recent illness

In all, 2,279 cases of child illnesses were reported from 1,538 households. The number of children reported ill was almost equally divided between the two locations where the study

was conducted: 50.1 per cent in the semi-urban areas compared to 49.9 per cent in the rural areas. The average number of children reported ill by each household was 1.4 for the semi-urban population and 1.6 for the rural areas. The distribution of the various types of illness reported is shown in Table 6. The patterns of illness by the major categories used above were similar to those reported in the Ondo survey.

Fever, mostly malaria, was dominant, while convulsions, cough-related illness and measles were significant. The sudden appearance of measles on the scale reported in the Ekiti survey is a major concern, and may well be a direct result of the failure of the immunization program. The recent withdrawal of financial support to the Expanded Immunization Programme (EPI) by USAID may well compound the situation. The majority of mothers responded quickly to their children's illnesses. In less than seven per cent of the cases did the illness last more than one week before treatment was sought.

Table 7 shows the distribution of the choice of health care providers in respect of child illness. Of the women in the semi-urban areas, 32 per cent sought treatment at the onset of their children's illness from government hospitals or health centres compared to 24 per cent who did so in the rural areas. Home treatment with herbs or medicine bought from stores or hawkers was reported by 45 per cent of semi-urban women and 62 per cent of the rural ones. Partly because of the general lack of private health care providers in the areas, and mostly because of the cost, only three per cent and two per cent in the semi-urban and the rural areas respectively used their services. Traditional health care providers or faith-healing were employed by 21 per cent in the semi-urban areas and 13 per cent in the rural areas.

Table 6
Distribution of the types of illnesses reported

Type of illnesses	Semi-urban		Rural	
	(N=1142)	%	(N=1137)	%
Fever (malaria)	46		70	
Convulsions	11		6	
Measles	9		6	
Stomach-related illness ^a	9		7	
Skin-related illness ^b	5		2	
Cough-related illness ^c	10		3	
General body pains ^d	3		2	
Others ^e	2		2	
Don't know	5		2	

^a Stomach-related illnesses include dysentery, diarrhoea, stomach ache and frequent bowel motions

^b Skin-related illnesses include chickenpox and smallpox, body sores (*inarun*), scabies and boils

^c Cough-related illnesses include tuberculosis, pneumonia, asthma, cold and catarrh

^d General body pains include chest, back, ear, eye pains; rheumatism (*lakuregbe* / *arunmoleegun*).

^e Others include 'did not reach seven days' (*makije* / *bomodije*), fontanelle (*oka-ori*), epilepsy (*warapa*), mumps (*segede*), anaemia, kwashiorkor, accident, bleeding, uvulectomy (*belubelu*), polio, appendicitis and matted hair (*dada*)

In the semi-urban areas, 78 per cent of the women compared with 86 per cent in the rural areas reported that their children fully recovered from their illnesses after the first treatment; while one per cent from each of the two locations had died, 22 per cent of the children in the semi-urban areas and 13 per cent of the rural ones were still ill.

Table 7
Choice of health care providers for child's illness during the month preceding the survey: 1st, 2nd and 3rd treatment (percentage distribution)

	Semi-urban			Rural		
	1st (N=1142)	2nd (N=248)	3rd (N=215)	1st (N=1137)	2nd (N=145)	3rd (N=93)
Hospital	32	12	2	24	27	3
Treated at home by parents	45	83	96	62	63	96
Family or private doctor	3	1	1	2	0	0
Traditional / faith-healing	21	11	1	13	10	1

There was a major shift during the second choice of treatment from hospital treatment in favour of home treatment by respondents in the semi-urban areas, while there was some consistency among the rural respondents. Nearly all the women in the two locations shifted to home treatment as the third choice of treatment as the illness progressed. This is a major departure from the findings from the Ondo survey: in Ondo Town, the proportion of women who used hospital treatment increased as the illness progressed. The pattern observed in the Ekiti study is not unrelated to the prevailing economic situation and the rising cost of health treatment. Between 1992 and 1994, the cost of treatment has more than doubled. Those who could not afford the cost simply resorted to home treatments by using herbs and medicine bought from medicine stores or hawkers. These are now major alternative sources of health care. However, they provide less efficient treatment because most of the medicines bought from hawkers are of little value, while patients hardly take enough dosage before they abandon treatment completely.

Table 8 shows a comparison between the person who decided upon treatment and who paid for it. A significant proportion of the semi-urban women were paying for their children's health treatment compared with the rural women, while the proportion of older siblings and relatives contributing to treatment cost has declined rapidly in the semi-urban areas. The pattern is comparable to that of the Ondo survey.

Table 8
Association between paying for child's treatment and making treatment decision (per cent distribution)

Person who paid for treatment	N	Person who decided upon treatment			
		Husband	Woman	Jointly	Others
Semi-urban		%	%	%	%
Husband	808	53	44	1	2
Woman	278	19	75	9	5
Jointly	14	43	36	21	0
Others	38	11	74	3	13
Rural					
Husband	701	75	21	2	2
Woman	302	13	84	a	3
Jointly	47	66	19	11	4
Others	57	19	14	5	61

^a less than one per cent

The association between paying for the child's treatment and the cost is presented in Table 9. The cost of a single health treatment has risen greatly compared to the situation when the Ondo study was conducted in 1992. The average cost of treatment of fever (malaria) was about 100 Naira or US\$5 in 1994 when the survey was conducted compared to 60 Naira or US\$3.33 when the Ondo survey was undertaken in 1992. There was a further drop in the official exchange rate from 18 Naira to 22 Naira to one US dollar between 1992 and 1994. During the same period there was also an increase in the price of petroleum from 70 kobo or about one US cent to 3.25 Naira or 15 US cents per litre since October 1994. The increase in cost of fuel has made the health situation worse.

As in the case of Ondo study, husbands met a substantial part of treatment cost, and the association between the person meeting the cost and the cost of treatment was statistically highly significant. The contribution of older siblings or relatives became significant for the rural respondents as the cost of treatment rose.

One of the main aims of the 1993/94 Ekiti study was to examine whether the status of a child within the household affects the kind of health treatment given to it. The survey therefore attempted a distinction between the biological children of the family and foster-children. Because of the small number of foster-children reported in the survey, the data are combined in this analysis for both the semi-urban area and the rural areas. A total of 168 foster-children were reported ill during the month preceding the investigation. The figure represents 7.4 per cent of all children reported ill during the period. The analysis is made in respect of the person who first noticed the child's illness, the duration of illness before treatment was received, where treatment was received, the person who decided on treatment, and the person who paid for treatment.

Table 9
Association between paying for child's treatment and cost of treatment (percentage distribution)

Person meeting cost	Cost in Naira and US dollars ^a					
	Semi-urban			Rural		
	Under Naira 100	Naira 100-200	Naira 201+	Under Naira 100	Naira 100-200	Naira 201+
	under US\$4.5 (N=878)	US\$4.5-9 (N=117)	US\$9+ (N=144)	under US\$4.5 (N=911)	US\$4.5-9 (N=116)	US\$9+ (N=84)
Husband	72	68	70	65	56	57
Woman	26	19	21	28	25	19
Joint	b	4	2	3	12	7
Others	2	9	7	4	7	17

a based on exchange rate of US\$1.0 to 22 Naira

b less than one per cent

Table 10 shows the relationships between the status of the child and the person who first noticed the child's illness. Clearly there were significant differences in the persons who first noticed the child's illness and the status of the child in the family. The fostered children were at a disadvantage.

Table 10
Relationship between the status of the child and the person who first noticed the child illness (percentage distribution)

Person who first noticed child's illness	Child's status	
	fostered (N=168)	non-fostered (N=2111)
Mother (foster-mother)	42	89
Father (foster-father)	4	5
Foster-child's parent	5	-
Child complained	29	4
Others ^a	21	2

^a Others include relatives and neighbours

Table 11
Duration of illness before treatment was received according to child's status (percentage distribution)

Duration of illness (in days)	Child's status	
	Fostered (N=168)	Non-fostered (N=2111)
1	35	58
2	12	19
3	10	12
4	8	4
5	13	3
6	6	1
7	9	2
8	8	2

On the duration of illness before treatment was received, the biological children of the family were at an advantage with more than one-half receiving medical attention on the first day compared with about one-third of foster-children. The distribution is shown in Table 11. Again, the differences were statistically highly significant.

There was also an apparent differential between the status of the child and where treatment was received. The relevant data are presented in Table 12. Although the difference is small, the foster-children were at a disadvantage in terms of hospital care.

Table 12
Treatment place according to child's status (percentage distribution)

Treatment place	Child's status	
	Fostered (N=168)	Non-fostered (N=2111)
Hospital or health centre	24	28
Home treatment	57	53
Family / Private doctor	1	2
Traditional /faith healing	18	17

The association between the status of the child and the persons who decided on treatment, and the person who paid for it is presented in Table 13. The differences were statistically highly significant and reflect the true status of the children.

Although there were close similarities in the pattern of child's illness and health seeking behaviour observed from the 1992 Ondo survey and the 1993/94 Ekiti study, one major change has been the apparent increase in the use of home treatment probably as a result of the rise in cost of treatment. Another is the sudden appearance of measles and other diseases that were virtually eradicated before the introduction of the structural adjustment program in 1986.

The Ekiti study also revealed some degree of discrimination against foster-children in responses to health treatment. The rising cost of treatment may well aggravate the health condition of this disadvantaged group.

Table 13
Association between the status of the child and the person who decided/paid for the treatment
(percentage distribution)

	Child's status			
	Fostered Who decided (N=168)	Who paid (N=168)	Non-fostered Who decided (N=2111)	Who paid (N=2111)
Father (foster-father)	30	47	50	67
Mother (foster-mother)	53	23	45	26
Jointly	4	6	1	3
Others ^a	13	24	4	3

^a mostly foster-child's parents and relatives

Summary and discussion

The studies reported in this paper show that the majority of mothers and their children suffered from a wide range of minor and often ill-defined complaints. Generally, health care was sought from several types of health care providers concurrently and sequentially and the various types of health care providers were seen as complementary rather than conflicting. Although a large proportion of women sought treatment from modern health care providers at the onset of illness, the proportion of those who employed home or self treatment was also significant. Faith-healing and traditional health care were under-reported primarily because of the tendency for people to use more than one health care provider concurrently at the onset of illness. However, studies elsewhere in southern Nigeria have shown an increase in the use of traditional health care providers by less educated women, and of faith-healing by both adult literate males and females (Uyanga 1979).

Generally, there was a tendency for respondents in the Ondo study to shift from one type of health care to another in the course of illness. Nevertheless, there was a distinct difference in health-seeking behaviour between urban and rural respondents. Most respondents in the urban area moved from home or self-treatment to hospital treatment as their illnesses progressed, while rural respondents tended to use a combination of hospital treatment, and modern medicines purchased from patent medicine stores or hawkers. In the Ekiti study, only a few respondents took their children back for treatment at the government hospital or private clinics after the first round of treatment. The majority did not return primarily because of the additional cost of treatment, so they resorted to home treatment with herbal preparations or medicine bought from chemists or hawkers.

Perhaps the central findings of the studies reported in this paper are the association between making decisions about treatment and paying for it, and the association between paying for treatment and the cost. When decisions were made by the women about their own treatment or that of their children, the women invariably paid for such treatment. However, when the cost was high, the husband paid a substantial part of it. The differences between the responses in the studies reported here were not significant.

A detailed analysis of females' contribution to the household expenditure from the Ondo study showed that 16 per cent of the women in the urban area and seven per cent of those in the rural areas met all their treatment costs, while the corresponding proportions for children's illness were ten per cent for the urban area and five per cent for the rural areas. Nevertheless, 63 per cent of the respondents in the urban area and 61 per cent of those in the rural areas

contributed to their own health treatment, while 55 per cent in the urban area and 56 per cent in the rural areas also contributed to their children's treatment. Apart from housing, women's contribution to other household expenditure had increased greatly since the advent of the current economic difficulties. The burdens had become a matter for a great deal of discussion and complaint among all women, irrespective of where they lived and their socio-economic status.

For the majority of mothers who did not return to report the outcome of their own treatment or that of their children to the health care providers, this was primarily because they were not told to report back. This has been a major source of complaint among the health care providers. Even when patients are given specific instructions to report back to the health care providers after a treatment regime, they hardly ever do so because of the additional costs that may be involved.

Contrary to expectation and the existing body of knowledge on health-seeking behaviour in many developing countries, education of mothers appeared to have had little influence on the health-seeking behaviour of mothers in the Ondo study. Nearly all the analyses carried out on treatment behaviour and costs showed no significant differences between women with no formal schooling and those with some schooling. The present difficulties arising from the measures instituted to redress the economic situation have probably had more effect on the educated mothers, who depended mainly on salaries or earnings from trading, and on their husbands' salaries and wages which were frequently in arrears for several months. Trading was at a low ebb, while farmers found it difficult to transport and sell their farm products. In addition, the real value of the earnings had declined, and was at variance with the costs of goods and services. The imposition of charges for government health services, and a move toward selling prescribed medicines at market prices, had created an extra burden on the educated mothers who were already accustomed to using modern health care providers.

These studies were carried out at a time when the Structural Adjustment Program was firmly in place and its impact had become evident in all aspects of life. Since the introduction of the program in 1986, the cost of treatment had risen excessively, and had become more difficult for many families to meet than had been the case for many decades. Certainly, the findings of the researches have several implications for health improvement through the adoption of appropriate intervention strategies. We now know that an increasing number of health-seekers are shifting to less efficient systems of health care, while more families than before are carrying the burden of health care. The poor are increasingly finding it difficult to meet health costs because of the high cost of treatment. The present state of the health care system and the poor responses to illness may have temporarily put a stop to the achievements in reducing morbidity and mortality before the introduction of SAP.

There are now apprehensions of a general rise in the level of morbidity, infant and childhood mortality. This is a major concern for many families and health care providers. Intervention strategies aimed at establishing flexible payment schemes and political will that can ease the burden created by the current economic difficulties are most urgently needed: the continuous extension of the 'user-pays' principle to the health care sector will make the goal of good health for all almost impossible, at least in the foreseeable future.

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The African population growth and development conundrum



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Socio-economic decadence and degradation

Africans with ages spanning two generations have seen it all happen. They are living witnesses to the prosperity that has presently eluded Africa. They saw the good old days of the 1960s and 1970s vanish, yielding place to the current crisis of growth and development and its attendant deprivation and pauperization of the population. As for those younger Africans born after political independence and therefore into the relative prosperity of the 1960s and 1970s, it has been their unfortunate lot to struggle endlessly to contain the deterioration in their own standards of living. Better equipped with education, knowledge and skills than their parents, they are finding no enabling environment for their progressive participation in meaningful development. They are the victims of unfulfilled expectations.

The acute economic problems and the ever-expanding population create pessimism about the future despite continued internal and external support. And yet for the continent which is rapidly and increasingly sinking into more deprivation and poverty, the urgent arrest of the situation is critical. The world no doubt is getting richer. Life in the affluent societies contrasts sharply with that in the pauperized developing world, particularly in sub-Saharan Africa. Such glaring disparity calls for critical appraisal and redress.

In the light of contemporary developments, it is no longer reasonable to attribute the state of affairs in Africa to either overpopulation or underdevelopment. The unaccomplished or delayed demographic transition and the growing penury in the continent call for a new strategy that will hasten the demographic transformation, satisfy the aspirations of the poor and help mitigate the pressures on the deteriorating environment. At stake is the achievement of sustainable human development which improves living conditions and gradually replenishes resources for the future. This type of development which involves complex interconnected processes of expanding education, health, employment and other basic needs provides the chief ingredient for lasting demographic transition with markedly reduced fertility and mortality (Speth 1994).

Recently, speaking on the importance of social development, the United Nations Secretary-General maintained that there was need to create an economic environment that was favourable to the attainment of social justice. He argued that poverty could not be overcome and greater social integration could not be attained in conditions of economic stagnation or recession (UN 1993a).

Further reinforcing the relevance of links between population and economic development, it was recently reported in UNFPA's *State of the World Population 1992* that in the 1980s, the 41 countries where population was growing more slowly experienced an average income growth of 1.23 per cent per annum while in the other 41 countries with faster population growth, incomes fell by an average of 1.25 per cent per annum, the difference between the two groups being a significant 2.5 per cent per annum. The report recognizes that

the observed relationship may be due to a combination of factors, a major one of which is education which surely aids economic growth, helps to reduce female fertility (Harrison 1994), lowers infant mortality, improves employment prospects of females and generally enhances their status, and raises the earning capacity of family households.

This presentation recognizes the presence all over sub-Saharan Africa of profound social problems — poverty, illiteracy, joblessness, disease, hunger — all connected with the lack of sustainable and integrated demographic, economic and social development. On these are predicated the occurrence of social change and development for population welfare and prosperity. The rate of population growth influences socio-economic development which in turn affects the process of demographic growth.

However, there is no inevitable Malthusian barrier to economic progress (Kelly and McGreevey 1994), as some high-fertility countries such as China and India have been experiencing high rates of per capita income growth. Nevertheless, the African crisis is very much a function of the structure of the African economy and its demographic configuration. Economic considerations apart, 'Africa remains transfixed in a high fertility/high mortality syndrome that scars its society generally' (Kelly and McGreevey 1994). Economically, it is a structure of dependency rather than self-reliance as the continent depends on external agents for the production of what its people need and for its industrial inputs such as capital, technology, skill, and spare parts. There is the dominance of subsistence production and a dependence on undeveloped and unscientific methods leading to low productivity. A catalogue of related causes has been compiled by the United Nations Economic Commission for Africa (ECA) under the distinguished leadership of its former Executive Secretary, Adebayo Adedeji.

The Commission also emphasizes the existence of a large informal sector, the degraded environment, an urban bias in development that permanently impoverishes the rural areas and the presence of weak institutional capacities (ECA 1991). The restrictions imposed by the prevailing social, political and demographic structures are also highlighted. The absence or non-observance of basic human rights and democratic participation has tended to engender dissatisfaction and civil conflict which discourage overseas investment and stifle domestic productivity. The socio-political environment has also nurtured a lack of probity and accountability. The rampant bankruptcy and breakdown of institutions and closing of unprofitable factories are related to the dearth of management and entrepreneurial skills. This occurs in situations where political, social, linguistic and ethnic considerations have led to frequent changes of ego-centred managers and consequently to a lack of the continuity of service and application of experience which are needed for greater efficiency and productivity.

Africa has always been prone to disasters. As well as the devastation caused by violent internecine conflicts, natural disasters have also occurred. Since cultivation technology is old-fashioned and exclusively dependent on rain, food supply has tended to be insufficient for the large family households common in the continent. When there are no rains, drought further reduces the food supply for an already deprived population. On the other hand, excessive rainfall from time to time brings floods which by destroying crops and livestock also aggravate the precarious food situation.

According to the Director-General of the United Nations Food and Agricultural Organization (FAO), sub-Saharan Africa was one place in the developing world where food production in 1993 increased by 3.4 per cent, but it was seriously affected by famine and food insufficiency (FAO 1993). With the decline in food production during the last 20 years, the region has progressively become a net importer of food (Massou 1995). At the 1994 FAO Regional Conference in Botswana, the Director of the Organization in his address pointed out that Africa was the only region in the world where food production per capita decreased

during the last quarter of the century. While 20 per cent of the population of the developing countries suffered from chronic undernutrition, the proportion in sub-Saharan Africa was 37 per cent. Thus while certain regions had access to 3,600 calories daily per capita, in sub-Saharan Africa the figure was no more than 2,100 (*Le Sahel*, 10 November 1994:4).

There are numerous manifestations of Africa's population and development crisis. Many vital issues, such as the crushing and destabilizing debt burden, exacerbate the short-supply of resources to satisfy the development needs of the population. The immensity of the debt problems was recently highlighted in an economic review showing that out of 32 countries in the world which are classified in a recent World Bank publication as severely indebted, 25 are in Africa (Ejimofor 1995).

In the foregoing review, Africa's crisis of development in relation to other major regions of the world was not considered. Table 1 presents some aspects of the relative deprivation in the continent. With the exception of South Asia, the gross national product (GNP) per capita of US\$504 is the lowest, amounting to 19 per cent of that of Latin America and the Caribbean and a mere 2.6 per cent of that of the industrialized countries. As Table 1 further shows, Africa, south of the Sahara, ranks the lowest of all regions in terms of the percentage

Table 1
Relative socio-economic indicators of Africa's well being and survival

Socio-economic indicators	Africa South of the Sahara	Middle East and North Africa	South Asia	East Asia and Pacific	Latin America and Caribbean	Industrialized countries
1. Gross National Product (GNP) per capita (US\$)	504	1,977	313	800	2,648	19,521
2. Primary school enrolment (%)	67	96	86	-	-	-
3. Adult literacy rate (%)	50	57	46	80	85	96
4. GNP per capita Rate of Growth						
(a) 1965-80 (%)	3.0	3.2	1.5	4.8	4.1	2.9
(b) 1980-92 (%)	-0.4	-0.7	3.0	6.5	0.0	2.2
5. Rural population below absolute poverty threshold (%)	62	-	39	17	49	-
6. Population with access to:						
(a) Potable water (%)	42	77	77	66	80	-
(b) Sanitation (%)	36	70	29	27	66	-
(c) Health services (%)	56	82	77	87	74	-

Source: UNICEF 1995:84-85.

of primary school enrolment, adult literacy, rural population below the absolute poverty threshold, and population with access to potable water, sanitation and health services.

Health and sanitary conditions have deteriorated so much that Primary Health Care (PHC) objectives are now not being fully realized. The achievement of health for all by the year 2000 is now unlikely mainly because of the weakness of health infrastructures and inadequate health and sanitation education, as well as weak management of health services delivery. The United Nations appraisal of the World Population Plan of Action made it clear that in attaining the goals related to morbidity and mortality, other regions than Africa have made progress (UN 1989).

The sterility of the demographic transition in Africa

Africa arguably has more population issues and problems to contend with than any other continent or major region of the world. While it is recognized that there are issues stemming from population distribution, internal and international migration, and urbanization, attention is mainly focused here on those which are more directly connected with the retardation of the demographic transition in Africa compared with other major world regions. The delayed transition has implications for the prevailing levels of fertility and mortality, rate of population growth, the emergent population structure and its effect on the provision of basic needs such as education, health, employment, and housing.

The prevailing rapid rate of population growth in Africa continues to be mortality-induced as well as fertility-driven (UN 1993b:8-9). The important question is when Africa will catch up with the developed countries where the demographic transition has advanced significantly. After a brief period of stagnation, the developed countries attained a very low level of population growth of 0.6 per cent per annum during 1980-1993 as shown in Table 1. East Asia as opposed to South Asia has reached the stage of transition to the low levels of growth prevalent in industrialized countries. Indeed, Japan had done so in this century.

Instead of declining, the rate of population growth in sub-Saharan Africa (Table 2) rose from 2.8 per cent per annum in 1965-80 to 3.0 in 1980-93. The latter rate is only marginally higher, by 3.4 per cent, than the rate for North Africa and the Middle East. It is, however, markedly higher by 36.4, 76.5, 42.9 and 500 per cent than the rates for South Asia, East Asia and the Pacific, Latin America and the Caribbean, and the industrialized countries respectively.

There are however indications that population growth rates began to decline in Northern Africa and Southern Africa during 1970-1975. Although relatively still high the recorded growth rate for these two regions was about 2.5 per cent per annum during 1985-1990 (UN 1993b:14-15).

Table 2
Relative demographic indicators of Africa's well-being and survival

Demographic and Socio-economic indicators	Africa South of the Sahara	Middle East and North Africa	South Asia	East Asia and Pacific	Latin America and Caribbean	Industrialized Countries
1. Annual population growth rate						
1965-80(%)	2.8	2.8	2.3	2.2	2.5	0.8
1980-93(%)	3.0	2.9	2.2	1.7	2.1	0.6
2. CBR decline						
1960-1993 (%)	8	26	27	41	38	35
3. CDR decline						
1960-1993 (%)	38	62	48	63	46	0
4. Synthetic Index of Fertility	6.4	4.9	4.2	2.5	3.0	1.8
5. Under 5 mortality decline						
1960-1993 (%)	30	71	47	76	69	77
6. Infant mortality decline						
1960-1993 (%)	28	66	40	68	64	75
7. % Urban population	31	55	26	31	73	76
8. Expectation of life at birth (1993)	51	64	59	68	68	76
9. Increase of expectation of life at birth						
1960-1993 (%)	28	36	28	45	21	10
10. Rate of use of contraceptives (%)	12	44	39	74	59	72
11. Annual rate of decline of synthetic fertility						
1960-1980 (%)	0.0	0.9	0.8	3.0	1.8	2.0
1980-1993 (%)	0.3	1.4	1.7	1.8	2.5	0.1

Source: UNICEF 1995.

As already indicated, the prevailing high rate of population growth derives from additions to the population due to high fertility as well as declining mortality. Globally, both variables have been changing. The total fertility rate (TFR) for the world declined from 5.0 during 1950-1955 to 3.3 during 1990-1995. However, the rate in sub-Saharan Africa in 1993 at 6.4 remains the highest in the world. Women in sub-Saharan Africa had 6.4 children during their reproductive lives, while those in industrialized countries had 1.8 children. Women in North Africa and the Middle East had 4.9 children which was still 26.4 per cent less than the rate for women in sub-Saharan Africa.

With total fertility rates of 4.2, 3.0 and 2.5 births per woman, fertility was much lower in South Asia, Latin America and the Caribbean, and East Asia and the Pacific than in sub-Saharan Africa. As shown in Table 2 the annual rates of decline in Africa during 1960-1980 and 1980-1993 were the lowest in all major regions. The rate did not decline during the first period and did so by only 0.3 per cent per annum during the second period 1980-1993 when the annual rates of decline were 1.4 per cent for North Africa, 1.7 for the Middle East, 1.8 for South Asia and the Pacific, and 2.5 for Latin America and the Caribbean. The TFR in the industrialized countries had fallen very low and had long been stabilized at below replacement level. No significant measurable decline occurred during the period. The very small fertility drop in sub-Saharan Africa can also be evaluated from the fact that during 1960-1993 the crude birth rate (CBR), also in Table 2, fell by a mere eight per cent in contrast to declines ranging from 26 to 41 per cent for the other major regions.

This pattern of fertility variation is supported by the fact that sub-Saharan Africa also had the lowest rate of use of contraceptives. This was only 12 per cent as against 39 per cent for South Asia and 59 per cent for Latin America and the Caribbean. The rate of use was remarkably 74 per cent for East Asia and the Pacific, and 72 per cent for the industrialized countries.

For Africa in general, two distinct fertility trends are emerging. One is the declining trend in some of the countries of Northern Africa (Algeria, Egypt, Morocco, and Tunisia) to which should be added the declining trend in Southern Africa (Botswana and South Africa). The second trend is the continuity of the high and constant rate of above six births per woman prevailing in sub-Saharan Africa.

Like fertility, relatively high mortality, even if declining, also distinguishes sub-Saharan Africa from the rest of the major areas of the world. Generally, from a level of 19.7 deaths per 1000 during 1950-1955, the crude death rate (CDR) for the whole world rapidly declined to 9.7 during 1985-1990. Apparently, CDR over the period declined faster than CBR. This is indicated in Table 2 for all major regions, including sub-Saharan Africa where CBR declined by only eight per cent during 1960-1993 while CDR in the same period declined by 38 per cent. In North Africa and the Middle East CBR fell by 26 per cent while CDR fell by 62 per cent. In South Asia CBR declined by 27 per cent and CDR by 48 per cent. This pattern of variation applies to East Asia and the Pacific, and Latin America and the Caribbean. For the industrialized countries, it is even more dramatic because although CBR continued to decline by 35 per cent, CDR had, even by 1960, fallen to the lowest level possible, which led to no further decline at the same level in 1993.

Life expectancy at birth in industrialized countries was 76 years in 1993 and 68 years in both East Asia and the Pacific as well as Latin America and the Caribbean. The lowest level of life expectancy at birth of 51 years was for sub-Saharan Africa. It was 64 for North Africa and the Middle East and 59 years for South Asia. During the period under consideration, 1960-1993, East Asia and the Pacific experienced the most rapid increase of 45 per cent in life expectancy at birth, followed by North Africa and the Middle East with a rise of 36 per cent. In sub-Saharan Africa, the increase was by 28 per cent and for Latin America and the Caribbean, 21 per cent. Since the industrialized countries had already attained a high level of augmentation of life expectancy at birth in 1960, their observed increase of 10 per cent in 1993 could only at that level represent a trimming-off of rough edges.

These regional variations mask the levels of attainment in individual countries. For instance, those with spectacular levels of life expectancy at birth of more than 75 years were in (a) Asia: Japan with the highest level of 78 years; Cyprus, Israel and Hong Kong; (b) Europe: Norway, Italy, France, Spain, Switzerland, Sweden, the Netherlands, Greece and Iceland; (c) North America: Canada and the USA; and (d) Oceania: Australia (UN 1993b:40).

As expected, the improvement in life expectancy at birth has been accomplished by a dramatic decline in the level of infant as well as childhood mortality in the world. The infant mortality rate in 1950-1955 was 155 per 1000 births and this was more than twice as high as the rate in 1985-1990. The rate during this same period (1985-1990) was 15 per 1000 births in the developed region. In the less developed countries, it was 76 per 1000 births. In Africa, it was 103 per 1000, 69 in Asia and 53 in Latin America. Europe recorded 12 per 1000 and North America the lowest, 10 per 1000 births (UN 1993b:42).

Table 2 further illustrates the regional variations in the spectacular decline in infant mortality. During 1960-1993, it declined by 28 per cent in sub-Saharan Africa, 66 per cent in North Africa and the Middle East, 40 per cent in South Asia, 68 per cent in East Asia and the Pacific, and 64 per cent in Latin America and the Caribbean. The highest decline of 75 was recorded in the industrialized countries.

The decline of child mortality followed a similar pattern to the one for infant mortality. During 1960-1993 (see Table 2), the under-five mortality level fell by only 30 per cent in sub-Saharan Africa and 47 per cent in South Asia. The decline of 77 per cent was highest in the industrialized countries followed closely by East Asia and the Pacific region with 76 per cent, North Africa and the Middle East 71 per cent, and Latin America and the Caribbean 69 per cent.

Further illustration of the regional variation in the level of decline in both infant and child mortality in the 30 years, 1960-1993, is given in Table 3. About two-thirds of the countries in sub-Saharan Africa had experienced less than 50 per cent declines in childhood mortality. This was made up of 27 per cent of countries with less than 30 per cent declines

Table 3
Extent of decline of under five mortality and infant mortality rates in the world's major regions, 1960 - 1993

Rate of Decline (%)	Africa		Number of Countries in				Developed Areas		Total	
	N	%	Asia	Latin America & Caribbean			N	%	N	%
(a) Under Five Mortality										
0 - 29	12	27	5	15	0	0	0	0	17	13
30 - 49	16	36	2	6	0	0	0	0	18	14
50 - 69	12	27	9	26	11	50	7	26	39	21
70 - 89	5	11	15	44	11	50	19	70	50	39
90 +	0	0	3	9	0	0	1	4	4	3
Total	45	100	34	100	22	100	27	100	128 ^a	100
(b) Infant Mortality										
0 - 29	14	31	2	6	0	0	0	0	16	13
30 - 49	18	40	8	24	1	5	0	0	27	21
50 - 69	11	25	6	18	13	59	11	41	41	32
70 - 89	2	4	17	50	8	36	16	59	43	34
90 +	0	0	1	3	0	0	0	0	1	1
Total	45	100	34	100	22	100	27	100	128 ^a	100

Source: UNICEF 1995. Note: ^a Excludes the 17 new states of Eastern Europe for which there were no data to facilitate the comparison.

and 36 per cent with 30-49 per cent declines. In this respect, Asia had 15 per cent of the countries with less than 30 per cent decline, and six per cent with 30-49 per cent decline. As can be seen from Table 3, the Latin American and Caribbean countries, as well as the developed ones, fell outside these categories. Fifty per cent of the Latin American and Caribbean countries experienced 50-69 per cent and 70-89 per cent declines respectively. For the developed areas, 26 per cent of the countries experienced 50-69 per cent declines while 70 per cent experienced 70-89 per cent declines in under-five child mortality.

Sub-Saharan countries performed worse with respect to infant mortality than under-five mortality, 71 per cent experiencing less than 50 per cent decline in infant mortality. Of this, 31 per cent experienced 30-49 per cent decline. More than 50 per cent decline was experienced in 29 per cent of sub-Saharan countries. For Asia, the proportion with more than 50 per cent decline was 71 per cent; for Latin America and the Caribbean countries and for the developed countries, it was 95 per cent. Thus Africa south of the Sahara has a long way to go to attain the levels of decline in the other areas of the developing world and even more so to reach the level in the developed region. It still has to take greater advantage of the low-cost techniques for promoting infant and child survival through better health education, basic sanitation, immunization and general strengthening of the health infrastructure.

Future control of mortality in the continent will be complicated by the emergence of the HIV/AIDS epidemic which has been, particularly in some countries, obstructing resource development and utilization. Not only are the victims relatively young adults in the economically active age group but governments have been compelled to divert general development and health resources to the care of AIDS patients. The World Health Organization maintains that over five million children from now up to the year 2000 will become orphans as a result of losing their mothers or both parents to AIDS. Children are increasingly being forced to pay the price of the AIDS epidemic not only because they lose their parents but also because they generally end up being victims of the disease. In 1993, about 700,000 children were born to seropositive mothers in Africa. The majority of these children who were born with the virus infection risk dying early while those who were not infected will survive as orphans or be condemned to live on their own without family care (Agence France Press 1994).

The reported levels, patterns and variations in the natural dynamics of population growth have also produced variation in population structure with implications for the socio-economic development of the major regions. Two trends have been apparent. The first, occurring in Africa and the rest of the developing world, has been a general 'juvenation' of the population, to borrow an expression from the United Nations. According to this, the proportion of children aged less than 15 years increases while that of the aged generally declines. The second trend, peculiar to the developed countries, has been one of aging, in which the proportion of those aged 65 years and above increases while that of children decreases. With juvenation, the median age of the population tends to decrease while with aging, it tends to increase.

Estimates of median age published by the United Nations show that for Africa the median age in 1960 was a low 18.1 years. It declined to 17.4 years in 1990 and was projected according to the medium variant projection to be 17.5 years in 1995. The median age for Asia was given as 20.9 years in 1960, rising to 23.3 in 1990 and 24.4 in 1995. In East Asia where fertility has been declining, it rose from 22.2 years in 1960 to 26.2 years in 1990 and 28.1 in 1995. In Europe where the transition had already reached an advanced stage, the mean age in 1960 was a relatively high one of 31.6 years rising to 34.9 years in 1990 and 36.0 years in 1995. Thus, the population of sub-Saharan Africa has been the only one with a declining median age as the share of children and youth increased through high fertility and declining mortality.

In order to determine the economic implications of the emergent age structure, whether juvenating or aging, account should be taken of the third component of persons aged 15-64 years who make up the working-age group on which the two other components, the children and the aged, depend for sustenance. This is measured by the dependency ratio.

The dependency ratios associated with the age structure of the major world regions are given in Table 4 for 1960 and 1995. As already demonstrated, the demographic transition has barely started in sub-Saharan Africa. Thus it is, of all the regions, developed and developing, the only place where the total dependency rate increased significantly from 87.9 per 100 active persons to 91.8 per 100 active persons aged 15-64 years. Only a very slight increase was observed for the aged in Africa.

Table 4
Dependency ratios by major regions, 1960-1995

Dependency ratio per 100 active population	Africa	Asia	Europe	Latin America & Caribbean	North America	Oceania	USSR (Former)	World Total
Age Groups								
1960								
0-14	82.3	70.1	39.9	79.0	52.4	55.2	49.4	64.1
65+	5.6	7.3	15.0	6.9	15.2	12.4	10.7	9.2
Total	87.9	77.4	54.9	85.9	67.6	67.6	60.1	73.3
1995								
0-14	85.9	51.8	28.4	55.3	33.2	40.4	39.2	51.8
65+	5.9	8.7	21.1	8.4	19.1	14.7	16.9	10.6
Total	91.8	60.5	49.5	63.7	52.3	55.1	56.1	62.4

Source: United Nations 1993a:258-281.

For the other major regions including Asia and Latin America, significant declines in the dependency burden occurred: in Asia from 77.4 in 1960 to 60.5 in 1995; in Latin America from 85.9 in 1960 to 63.7 in 1995; and in Europe from 54.9 in 1960 to 49.5 in 1995. Similar significant declines can be seen in Table 4 for North America, Oceania and the former USSR. In the developed regions (Europe, North America, Oceania and the USSR), the trend towards aging of the population can be seen from a rise in the dependency ratio of the population aged 65 years or more. For instance, their ratio rose in Europe from 15.0 in 1960 to 21.1 in 1995. That in Africa was 5.6 per 100 in 1960 and 5.9 in 1995.

Progress in population and development policies in sub-Saharan Africa

Ostensibly, policies have been implemented to regulate the relationship between population and development in order to attain improved living conditions. The concern has been that the development has been somehow irregular and perhaps of limited effect. By 1974 only three sub-Saharan countries (Ghana in 1969, Kenya in 1967, and Mauritius in 1958) had adopted an explicit population policy. The number, despite the claim of growing awareness of the importance of population factors in development planning, rose only to six to include Liberia (1987), Niger (1988), and Senegal (1988).

However, in 1988 several countries, Rwanda, Sudan, Togo, Zaire and Zambia, were assessed to be drafting national population policies for national and parliamentary

consideration and adoption.¹ Another 12 countries, Benin, Botswana, Burkina Faso, Cameroon, Chad, Madagascar, Niger, Sierra Leone, Swaziland, Tanzania, Uganda and Zimbabwe, proposed the drafting of population policies (Mosley and Branick 1989).

Nevertheless, the critical question is why no progress has been made in spite of the efforts, even if limited, and indeed in spite of governmental participation and declarations at world population conferences and other politically focused meetings. For example, 44 African governments meeting in Arusha, Tanzania in 1984, preparatory to the Mexico World Population Conference in the same year, recognized the importance of population in development and adopted the Kilimanjaro Programme of Action (ECA 1992). Subsequently in 1992 and preparatory to the Cairo population conference in 1994, they also adopted the Ngor Declaration in Dakar, Senegal (ECA 1992). The follow-up to the decisions of these meetings has not been as effective as expected. They do not appear to have created a real depth of awareness among the masses of ordinary people, only among government officials who may provide political support but do so mainly in a social sphere where the desired innovations cannot reach the consciousness of the masses. A growing awareness among governmental agents is not the same as that among the people (family and social groups as well as individuals) directly affected by the application of various policy options.

Plans are supposed to spell out the details of population and development policies. There have been indications that African governments are increasingly recognizing that population growth has implications for national development (Mosley and Branick 1989). However, in African development plans the methods adopted varied a great deal from the very rudimentary to the most complex. Of the more complex, the highly recommended integrated approach which takes into account the interrelationship between population and development has not been commonly implemented.

Complex projections and models have not been easy to apply in Africa because of the prevailing weak data base and dearth of trained personnel. Some countries have barely described their demographic profile and trends, others have more seriously undertaken some macro and sector analysis, while a few have focused on demonstrating the relationship between population and selected socio-economic factors such as income distribution, education, savings, food and nutrition.

Because of these problems, African countries have been implementing policy measures which are implicit and indirect rather than explicit and direct. These measures sometimes obliquely influence population variables while explicit and direct measures have a direct bearing through well defined goals and strategies (Ohadike 1992).

Scrutiny suggests that in Africa, family planning policies designed to regulate population increase and economic growth have been given greater attention than non-family planning aspects of policy. This may be justified because the contribution of high fertility to population growth is the most critical factor affecting the pace of development. Besides, and specifically in terms of the demographic transition, fertility, by its very nature and resilience and for cultural reasons, has been more resistant than mortality to change and innovation. Births are normally welcome events but deaths though inevitable are occasions for sorrow.

The cultural drag is partly related to the very low use of contraceptives, which already has been shown to be the lowest in the world. This also has to be assessed against the apparent contradiction that 27 sub-Saharan African countries provide support for family planning services mainly for the combined reasons of promoting maternal and child health (MCH) and family health and reducing the levels of fertility and population growth, while some 15 other countries support family planning services for health reasons alone. The overall volume of

¹ In Zambia, the National Commission for Development Planning prepared in 1989 the first National Population Policy which now provides the blueprint for action by NGOs.

support agrees with the survey findings of the United Nations that between 1976 and 1989 more and more governments in Africa were beginning to perceive their fertility and population growth rates as too high (Ohadike 1992). But the successful practice of family planning is a different matter.

The policy on the control of mortality has always had the universal support of African governments and efforts in this direction, even if relatively limited, have been more successful than those in respect of fertility. Primary Health Care programs following the Alma Ata declaration in 1978 have been pursued, although with limited success. Because there have been no major improvements in the ten years after the declaration, WHO launched the Bamako Initiative. This was aimed at strengthening and decentralizing community health service delivery, and taking it, along with financial support and the element of participation, directly to where people live. The success or failure of Primary Health Care was affected by the unanticipated global economic recession which reduced the level of funding; and by the added health complications created by the sudden emergence of HIV/AIDS, the treatment of which has led to the diversion of funds from other areas of health care.

Nevertheless, PHC has led to some achievements in the promotion of health in the region. Indications are that immunization coverage increased from less than 50, to 70 per cent or more in most countries, and MCH services have improved and become more accessible. Also the program on safe motherhood initiatives has gained momentum and the services of Traditional Birth Attendants and Community Health Workers have gained some recognition (WHO 1991). The adoption of the Expanded Programme on Immunization helped to reduce maternal and child deaths while improved sanitation and environmental programs have helped to control the spread of communicable and diarrhoeal diseases. The measures have led to the fall in the level of mortality which has been augmenting the size of the African population.

Since this analysis is focused on the delayed demographic transition in Africa, attention will not be given to population and development policies affecting population movements, distribution and urbanization. However, it is necessary to re-emphasize that an explicit, integrated and multidisciplinary population and development policy should certainly deal with all facets of socio-economic and demographic interrelationships.

The effectiveness of population policies adopted in Africa was hampered by the questionable methods of implementation. This was very much related to the failure by governments to institutionalize the operation of policies to support their sustainability. Implementation involves the translation of policy ideas into action through predetermined strategies and instrumentalities for the satisfaction of basic needs, including the provision of family planning. Essentially, implementation calls for carefully co-ordinated programs of research, which were lacking in many countries.

In many instances, implementation, more than formulation, was neglected or at best poorly executed. Most policies when formulated did not allow for any detailed and serious implementation program including co-ordination. The reasons for this include inadequate infrastructure and information, as well as lack of finance and trained and devoted staff. Implementation in Africa, therefore, relied heavily on external multilateral and bilateral funding and very limited internal financial resources. Political will and commitment to the policies were also lacking as was government funding to reinforce political commitment. This partly explains why policies dating back to the 1960s such as in Kenya and Ghana have had very little effect after so many years of existence.

Co-ordination between the formulating and implementing agencies including NGOs and the private sector was weak or totally lacking as has been shown for Ghana (Omaboe 1991). The involvement of the private sector through the use of more NGO services and through social marketing by the Futures Group was long in coming and the public sector could not afford all the funding and infrastructure requirements. Also implementation of programs did

not reach all segments of the population. Rural areas and males were neglected. The people, as recipients of services, were not adequately involved or informed about the services being provided.

An aspect of the lack of procedures for implementing policies has been the absence of appropriate ways to ensure the inclusion of population variables in the planning process. For the long-term survival, effect and sustainability of programs, adequate instrumentalities are needed in many countries to ensure that program activities continue even when external support has ended. The required mechanism should be created from the start to ensure that projects are implemented as part of the overall normal development programs.

Apart from infrastructure and funding requirements, most African governments have yet to develop the professionals for integration, institutionalization and co-ordination activities. Staff for data collection and analysis have been trained in a number of institutions in and outside the continent but not enough in these vital areas, especially effective integration. Population Planning Units have been created in many countries. It is not clear how effective these are, especially when they appear to be accorded lower priority than other departments concerned with planning. Besides, the units have not usually been located in the ministries with the core responsibility for planning and co-ordinating national development programs. At this time the location and distribution of duties of units have not been equitably organized. Some countries have established population commissions; others have created units, sections or centres. The effect of these bodies has yet to be assessed.

Agenda for renewed action

Economic-demographic interrelationships are the basis of Africa's problem of underdevelopment and the retardation of the demographic transition. Buttressing the demographic and economic forces and ensuring their persistence have been the adventitious results of socio-cultural and traditional factors. The interaction of economic-demographic and socio-cultural forces has been the major correlate of deteriorating general conditions of living and worsening poverty and marginalization, despite the efforts of the national and international communities.

The analysis so far undertaken seems to support the view that Africa with its plethora of economic-demographic problems unequalled anywhere else in the world, requires quick and concerted remedies. Unless the current situation is redressed, the continent will plunge deeper into penury and so take much longer to stabilize its population and go through the demographic transition. The former Director of the WHO Regional Office for Africa, Dr Monekosso, after reciting a list of Africa's woes, concluded that Africa has the image of a continent cursed and condemned to despair (Monekosso 1994).

The situation calls for a total refocusing of demographic and socio-economic development to take sufficient account of the social aspects of development relating to the provision of basic needs including family planning. This will be a difficult task requiring some fundamental re-assessment of priorities and careful control and interpretation of the transformations associated with demographic, economic, and social innovations.

Demographic innovations, especially those affecting fertility, do not operate in isolation. The required transformation is bound by cultural, social and economic imperatives of African life. These imperatives are relevant to the ease of acceptance of change in view of the time it will take for the new behaviour patterns to be accepted and practised. This calls for prudence in introducing change or we will run the risk of either passive acceptance or total rejection. People are concerned more with satisfying immediate mundane needs than with working for long-term advantages which in the end may be more rewarding. Long-term advantages are not easy to comprehend, especially if people are badly deprived. So Africa needs greater

sensitizing to improve the well-being of its people. An agenda for revived action is called for in the demographic, economic and socio-cultural areas.

Demographic revitalization

Other things being equal, the persistent African economic-demographic crisis has been the consequence of declining mortality and high and constant (sometimes rising) fertility. The demographic transition in Africa has barely begun. The decline in mortality has been due to the health technology developed in the West; this especially has led to a slight reduction of infant deaths resulting from better hygiene and sanitation among the better informed and more enlightened mothers. There is, however, room for further significant mortality decline and governments should strive for this as well as for the commencement of fertility decline.

Mortality

Efforts to attain further significant declines in mortality in the region should be made for two main reasons. First, health improvement should continue to be used to improve well-being and survival which will in turn develop human resources and enhance productivity at all levels. Second, available evidence is that in all known transitions that attained the advanced stage, the fall in fertility was accompanied (presumably preceded) by a decline in mortality, especially infant and child mortality. This is illustrated in Table 5 for all the major regions of the world including Africa. The table shows that mortality decline during 1960-1993 was negatively correlated with the level of synthetic fertility in 1993.

Table 5
Results of regression analysis of childhood mortality decline (1960-93) and levels of fertility (1993) in countries by major regions ^a

Region	Infant Mortality			Under-five Mortality		
	B	Beta	P-value	B	Beta	P-value
Gobal	-0.067	-0.725	0.0000	-0.064	-0.690	0.0000
Africa	-0.035	-0.563	0.0001	-0.034	-0.594	0.0275
Asia	-0.037	-0.438	0.0096	-0.032	-0.378	0.0275
Latin America & Caribbean	-0.044	-0.3461	0.0307	-0.045	-0.378	0.0238
Developed countries	-0.038	-0.676	0.0001	-0.032	-0.582	0.0015

^a See Annexe for list of countries

The Latin American and Caribbean region exhibits the weakest association between decline in fertility and decline in child mortality. However, it experienced greater proportionate reduction in fertility per unit decline in either infant (4.4%) or under-five (4.8%) mortality than any other region. In the industrialized countries, there is a fairly strong association between decline in infant mortality and decline in fertility. The association between decline in under-five mortality and decline in fertility is moderate. But the proportionate decline in fertility per unit decline in either infant (3.8%) or under-five (3.2%) mortality is similar to that observed for the Asian region.

Continued reduction of mortality will also mean that the rate of population growth will be accelerated and so precipitate additional problems of socio-economic dependency and human resources development, especially in the areas of education, employment and health. But mortality reduction programs should also be accompanied by a co-ordinated fertility reduction

scheme. In this way, governments can improve health and lower mortality as well as lower fertility and attain lower rates of population growth.

Just as mortality remains relatively high in the region, so also are the majority of countries still in the early phase of the transition to good health. Epidemiological conditions indicate the prevalence of parasitic and communicable diseases as the main killers, especially when they afflict the population in epidemic proportions. Development and strengthening of preventive PHC focused on better living conditions and environmental sanitation, and especially on a clean potable water supply, should be given greater attention than hospital-based chemotherapeutic care. Experience so far with the implementation of the Alma Ata declaration and subsequently the Bamako Initiative underlines the importance of strengthening community-based action and decentralizing PHC to the village and district levels. This provides more cost-effective services and promotes general awareness that good hygiene and sanitation, food and nutrition, water supply, prenatal and MCH care including immunization and rehydration therapy, contribute greatly to reducing sickness, disabilities and death.

The enlightenment and involvement of women in particular, their education, improved status, and legal and economic independence are important factors in heightening awareness and acceptance of PHC services. Governments should continue to strengthen these programs. The role of women in the promotion of good health, especially that of children, is already recognized (Caldwell 1980, 1986). Although some progress is being made to improve the status of women in Africa, more needs to be done to articulate and strengthen women's rights and autonomy.

Two other aspects of decentralization of health services should be stressed. The first is the involvement of traditional birth attendants and community health workers whose services should be integrated into the national health delivery system. The second is promotion of a system of community financial support for health programs and for the delivery of services which will help sustain them. This has been found to be beneficial in rural areas where fees have been imposed for services rendered. While fostering a sense of belonging, responsibility and dignity in community members, it has helped to reduce over-dependence on the central government and external resources. It has also encouraged the continuity of programs and even more importantly it has helped to focus health priorities on the actual needs of the people and not just on preconceived notions and unverified hypotheses.

To move further through the epidemiological transition, African countries should strengthen PHC strategies for all by intensifying social and political action. They should empower the people, particularly women, by providing information, education and communication (IEC) on PHC matters. Health personnel should be better educated and trained to cope with decentralization of services to the villages and districts and the cultural adaptations required. Finally the decentralization and creation of local health centres means reducing the work load imposed on hospitals which should no longer provide PHC but should serve more as referral points to handle complicated cases that local community-based centres may be ill-equipped to handle (Ebin 1994).

Fertility and family planning

The analysis so far has underlined the fact that population places a burden on the resources for the provision of services. It has also shown that to avoid growth due to mortality decline placing a burden on the provision of services, mortality control programs should include fertility regulation. The way to this is through family planning, the practice of which is very low in Africa, indeed the lowest of all the major world regions. The relative absence of family planning has been associated with a high incidence of abortion and unnecessary childbirth

especially among adolescents. Experience in other parts of the world shows that the incidence of abortion is lowest in populations where family planning is widely and effectively practised (UN 1989:26). African countries can take advantage of this and promote greater use of family planning.

A major move in this direction will be to democratize the provision of family planning as a basic need of the population. It should be available to all sections of society especially the largely marginalized groups in the rural areas. Other groups such as males, adolescents and young people who were neglected in the past should be included. The point is not only to increase access but also to improve the quality of family planning services and to offer a wide range of methods so that users have freedom of choice.

To continue to create and strengthen awareness and knowledge of family planning, information through IEC programs should be available to all segments of the population, especially those in rural areas where most of Africa's population lives. Family planning services and information reinforce each other and should be provided together and given equal attention.

Government support, financial, human and material, should be total and make it possible to provide services, essentially from local resources, to all sections of the country. External funding and support are vital and should be pursued but only if it is accepted that such external support supplements the internal support generated by African governments.

As in the case for lowering mortality, the empowerment of women through an all-round support of development programs which enhance their status and reduce the gender gap should be addressed by all governments to promote family planning and lower fertility. Special efforts should be made to facilitate the education and employment of women as well as enabling them to have legal rights to their bodies, land and family property.

The environment in which people live has implications for the promotion of family planning. Socio-cultural forces are as important as socio-economic factors in determining behaviour. In particular, in controlling fertility through family planning consideration needs to be given to ways of dealing with those social and cultural forces which support high fertility in African societies.

Governments should support policy-oriented information gathering, social research, and anthropological studies on the cultural and traditional determinants of fertility behaviour and response to innovations. The results of such investigations should be widely disseminated among relevant users. In addition, support is needed for research into the delivery of family planning services. This would include collection and analysis of data on acceptance and continuation rates, characteristics of participants and methods used. Evaluation of programs, their management and effectiveness would also be necessary.

Existing family planning programs have been poorly managed and this partly accounts for their limited expansion and effect. There is, therefore, the need to install an innovative and effective system of program management in general. Better management will be reflected in the quality of vital routine activities and the development of all forms of available resources. Good management depends very much on the establishment right from the start of sound institutional machinery for a plan of implementation, including monitoring and evaluation. The feedback and results of monitoring and evaluation would be used to redesign the existing program and to carry out further evaluation which should be continuous. Innovative IEC methods for public information campaigns should also be used.

The successful execution of all these activities is contingent on maintaining systematic record-keeping that permits periodic analysis of information to assess the evolution of the program and correct any errors to ensure its continuity. As argued elsewhere, it is vital to install a strategic management system with checks and balances to deal with daily family

planning implementation and to anticipate and handle future contingencies (Ohadike and Adansi 1989).

A viable co-ordination system is an important part of good management of family planning programs. Such co-ordination will be useful in promoting judicious and economical use of resources, and in fostering greater harmony and understanding among donor agencies and operators. To enhance program effectiveness, there should be a clear-cut delineation of areas of responsibility among concerned ministries, organizations and agents to eliminate wasteful competition, duplication and waste of resources. The gap between the formulation of family planning programs and their implementation should be bridged as part of the required process of co-ordination which should again be backed by cultivated professionals not only in family planning but also in general population and development policies.

The creation and strengthening of machinery for overall population policy development, of which family planning is a major factor, can speed up the demographic transition. Such an institutional mechanism should be created from the start and made to work, backed by adequate political will and commitment, and by provision of human, financial and material resources from the national budget. External support by donors should only supplement or complement national effort and should be properly used and accounted for. The machinery should be part of the larger system for total national development of all sectors, and should be sited in or within reach of the national agency or ministry responsible for national development planning.

Socio-economic renewal

The sluggishness of the demographic transition and the associated population and development problems have to be addressed and possibly resolved also through socio-economic changes.

Despite the persistence of a hostile economic environment, African governments should rededicate themselves to sustainable and self-reliant development with less dependence on external aid. If they receive aid, it should be genuine and disinterested, and should be such as to help the country to become more self-reliant. In this respect, all governments should exclude luxuries and work for the social survival of their people through sustainability and self-reliance in the provision of essential basic needs such as education, health, housing, employment and transport. As Speth (1994) notes, 'enduring declines in fertility can only be achieved in the context of high levels of sustainable human development'.

To achieve auto-centred development and sustainability, the level of production of wealth and income has to increase internally to reduce dependence on external sources, donor agencies and benevolent countries. This is the only avenue to self-sufficiency especially in the provision of basic needs.

Reiterating the view espoused in the 1974 Bucharest Conference World Population Plan of Action, the Mexico Conference recommendations in 1984 urged all governments to adopt the integrated planning approach in the formulation of development strategies. This approach, though complex, is still valid and should be used. Government should institutionalize integration through creating units for the formulation of policies. Such units should help with preparing data and information for use in planning. Staff should be instructed on the meaning and implications of integration and should be armed with the appropriate methods to achieve it.

Of all the basic needs, none gives a more sombre image of a dying Africa than the shortage of adequate food. Newspaper stories of Africans dying from drought-induced famine in particular, are common. The occurrence has been cyclical since 1974. Although concerned humanity has admirably rallied to salvage the desperate situation, food insecurity is basically an African problem. The main solution lies in augmenting productivity and production of

staple foods, not cash crops. Rainfed agriculture should be complemented with cultivation based on irrigation and small dams. Wars have hampered agricultural production. Hence countries at war should intensify efforts to restore peace and undertake relief and rehabilitation measures. Immediate danger from starvation in times of scarcity can be arrested by governments installing food security and storage systems. The ultimate goal of international assistance should be to help African countries to achieve self-sufficiency in food production.

Investment in human resources through education invariably enhances economic productivity and hastens the demographic transition by reducing fertility in particular. African governments should therefore invest in the education of their people, male and female alike. In fact, in terms of the demographic transition, greater educational opportunities should be created for girls and women who should also be accorded greater access to jobs and property ownership especially in the traditional setting. Additionally, investment in education for all contributes to reducing preference for large families and for sons over daughters. Education enhances child survival which in the long run contributes to lower fertility in that families forgo having extra children to compensate for possible child deaths. Also providing more education to women helps to raise the age of marriage and the average age of first childbirth, both of which can lower fertility.

For the above and other reasons women's education and participation in the labour force should be vigorously promoted. This should be accompanied by actual elimination of measures in law, tradition and practice which discriminate against women. Countries that have yet to accede to the Convention on the Elimination of All Forms of Discrimination against Women should do so.

The prevalent heavy debt burden which unfortunately is a hindrance to economic development is an affront to the debtors as well as the creditors. Apart from the dead weight imposed by the volume of debt, the interest payments, representing a significant drain of resources from Africa to the rich countries, amounts to over one-third of the already meagre total export earnings of the debtor African countries. Even so, this high proportion does nothing to reduce the total volume of debts which, over the years, has been increasing. African countries should however continue to acknowledge their responsibilities to creditors. They should make efforts to manage their economies more prudently for enhanced productivity in a climate of stability, rule of law, democracy, and respect for both majority and minority rights. In return, the international community should show greater understanding and co-operation to achieve a speedy resolution of the debt burden in general.

In dealing with population, resources and environment, it is important to bear in mind that patterns of consumption of natural and man-made resources affect the environment. African governments are urged to take cognizance of this especially as their large population size leads to depletion of resources, notable deforestation and loss of biodiversity in tropical forests. Sustainable and environmentally sound development is particularly relevant in the large capital cities, which as a result of overcrowding and the breakdown of municipal support services have problems of inadequate sanitation. In some streets there are mountains of domestic household wastes which no one removes.

There is now a deep-seated yearning all over Africa for peace and political stability without which development will be dead as it is in Angola, Rwanda, Burundi, Liberia, Sierra Leone, and Somalia. The need for peace was recently underscored when the African Regional Conference on Women and Development meeting of over 5000 delegates in Dakar from 13 to 23 November 1994 adopted a resolution calling for security and peace to reign and for all warring army factions, OAU, UN, and African governments to work for peace and protection for refugees, women and children.

The position taken by the women at the meeting stresses the need for peace and security in the continent. It is incumbent on African leaders to solve problems arising out of political, social, religious or ethnic differences by dialogue rather than confrontation. Leaders should practise good governance, tolerance and accommodation. They should be accountable and transparent and should eschew all forms of discrimination against any group. A peaceful environment for development will exist if these conditions prevail.

Conclusion

Africa today has great untapped resources but a large proportion of its population suffers from despondency, poverty and deprivation. For the last 35 years or so, despite the volume of assistance from the international community, African countries have not been successful in curing the malaise. This paralysis constitutes the major conundrum of African development. There has been a total evaporation of the development successes of the 1960s and 1970s and a marked decline thereafter, in a world that has been increasingly experiencing unprecedented expansion of wealth. The growing contrast between prosperity in the rich world and misery in Africa south of the Sahara and other developing areas is unhealthy for global survival.

Given that most favourable conditions in the continent are in a state of flux, another riddle is to ascertain if and when Africa in contrast to other developing countries, can possibly attain an advanced stage in the demographic transition. In this respect, it is highly desirable to have a better understanding of why previous population and development policy efforts have yielded no more encouraging results than recorded so far. The continent, through national activities, has participated in the global efforts through conferences, training, funding, IEC activities, planning and development, and yet the transition, both demographic and epidemiological, has been delayed.

Still another riddle is founded on a rather simplistic expectation of the elimination of poverty and inequality in international economic relations through the rich solving the problems of the poor. It is an ethical view, but benevolence is not part of the rationalism of economics. It will take acceptance of the seriousness of these problems for there to be a realization that humanity must sink or swim together. It is now really a matter of altruism and discernment, for the laws of economics appear to have been dead long ago in Africa.

To implement UNDP views on international responsibility and co-operation, Africa will still have to find funds in order to co-operate as required, for example, by the 20:20 proposal for cost sharing in promoting human development. The implementation of the proposal belongs to the future and requires a lot of goodwill, understanding and sacrifice on the part of donors. So far only a handful of rich countries have been able to answer the international call to make available 0.7 per cent of their gross domestic product for overseas development assistance. It is therefore obvious that African development is an extremely difficult problem. For the moment it is a conundrum.

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Annexe

Synthetic Index of Fertility Levels of Countries by Major Regions

Synthetic Index of Fertility	Countries by Major Regions
(a) AFRICAN COUNTRIES	
1 - 4	Mauritius, Tunis
4 - 5	Lesotho, Algeria, Egypt, Morocco, South Africa
5 - 6	Botswana, Cameroon, Gabon, Ghana, Guinea Bissau, Eritrea, Chad, Zimbabwe
6+	Niger, Angola, Sierra Leone, Mozambique, Guinea, Malawi, Liberia, Mali, Somalia, Ethiopia, Zambia, Mauritania, Nigeria, Zaire, Uganda, Burundi, Central African Republic, Burkina Faso, Tanzania, Madagascar, Benin, Rwanda, Togo, Sudan, Ivory Coast, Congo, Libya, Kenya, Namibia
(b) ASIAN COUNTRIES	
1 - 3	China, Thailand, North Korea, Sri Lanka, South Korea, Israel, Hong Kong, Japan, Singapore
3 - 4	India, Indonesia, Philippines, Vietnam, Malaysia, Lebanon, Kuwait
4 - 5	Cambodia, Bangladesh, Myanmar, Mongolia, Papua New Guinea, United Arab Emirate
5 - 6	Bhutan, Iran, Irak, Jordan
6+	Afghanistan, Laos, Pakistan, Nepal, Yemen, Oman, Syria, Saudi Arabia
(c) LATIN AMERICAN AND CARIBBEAN COUNTRIES	
1 - 4	Brazil, Peru, Equador, Dominican Republic, Mexico, Argentina, Venezuela, Trinidad and Tobago, Uruguay, Panama, Colombia, Chile, Costa Rica, Jamaica, Cuba
4 - 5	El Salvador, Honduras, Paraguay, Haiti, Bolivia
5 - 6	Guatemala, Nigaragua
(d) DEVELOPED COUNTRIES	
1 - 2	Ex-Yugoslavia, Bulgaria, Hungary, Portugal, Greece, Belgium, Spain, France, Australia, Canada, Switzerland, United Kingdom, Austria, Netherlands, Germany, Denmark, Finland, Italy
2 - 3	Albania, Rumania, Poland, U.S.A., New Zealand, Ireland, Sweden
3 - 4	Turkey

Source: UNICEF 1995:74-75

Demographic transition: the predicament of sub-Saharan Africa



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Sub-Saharan Africa consists of countries regarded as underdeveloped or developing and is part of the so-called Third World. Third World countries share many characteristics but at the continental level they are not the same. For instance, sub-Saharan Africa is sparsely populated, in contrast to South and East Asia, and it is much less urbanized than Latin America. It stands out among the other major regions of the Third World as having the slowest rate of economic growth in recent years: an average annual growth rate of gross domestic product of 2.4 per cent between 1980 and 1990 compared to 3.0 per cent in South Asia, 4.3 in Middle East and North Africa and 3.1 per cent in Latin America during the same period; its population growth is outstripping that of food production and also it is politically Balkanized, consisting of a large number of countries most of which are small and at an early stage of development. There are 50 of them, including South Africa and British Indian Ocean Territory. The latter is excluded from the discussion for lack of demographic information while the former will not figure much for a number of reasons. We know more about the demographic profiles of the other countries of the region than we do about South Africa. Reports on the methodology of studies conducted in South Africa are not published and major questions on coverage, sampling methods, response rates and other factors remain unanswered (Caldwell and Caldwell 1993).

Sub-Saharan Africa emerged from the second World War with a total estimated population of 181 million in 1950, and an annual growth rate of 2.2 per cent. The population doubled within the following 27 years (1950-1977) and the annual growth rate climbed to 3.0 per cent. The expansion of the population has continued unabated, reaching 531 million in 1990 and it is estimated to rise to 739 million by the end of the century with the doubling period reduced to 23 years and the rate of growth increasing to 3.4 per cent per year. The third doubling of the population will occur within the next 18 years with an estimated number of 1.5 billion people and a growth rate of 3.8 per cent per year. Except for South Africa, Mauritius, Guinea Bissau, Chad and war-torn countries such as Angola, Somalia and Mozambique, the populations of most of the countries accelerated at average annual rates of 2.6 per cent and over between 1980 and 1992. Among the countries with such high rates of growth are Botswana (3.4), Kenya (3.6), Congo (3.4), Zambia (3.8), Cameroon (3.5), C'te d'Ivoire (3.8), Zaïre (3.3), Tanzania (3.0), Comoros (3.7), Nigeria (3.3), Niger (3.3), Uganda (3.0), Mali (3.2), Zimbabwe (3.3), Ethiopia (3.1) and Togo (3.3) (World Bank 1994). Over the past two decades the number of countries growing at rates of 3.0 per cent and over increased from seven to 16.

Why are the growth rates so high? Since World War I, medical and public health technologies have been made available to virtually all countries in the subcontinent whatever the level of economic development. With the introduction of antibiotics, antimalarial spraying and increased use of vaccination, the decline in mortality accelerated in the 1950s and spread to all countries. Driven by falling mortality and continued high fertility, the growth rate rose from two per cent per annum in the 1950s to three per cent per annum in 1994. The current population growth in sub-Saharan Africa is a phenomenon for which the economic and

demographic history of mankind offers no real precedent. Birth rates are above 40 per thousand and have changed very little or not at all. The total fertility rates range from between four and five in Zimbabwe and Botswana to six or more children per woman in the remainder of the countries. On the other hand, all the countries in the subcontinent have experienced significant declines in their death rates over the past 35 years except for Malawi, Sierra Leone, Guinea, Guinea Bissau and Mozambique where the rates are estimated to be 20 or more deaths per thousand population.

Table 1
Population growth in 29 sub-Saharan African countries: 1980 to 1980-1992

Average annual rate of growth (per cent)	Number of countries	
	1980	1992
<2	1	1
2.0-2.4	8	3
2.5-2.9	13	9
3.0-3.5	3	14
>3	4	2
Total	29	29

Source: World Bank 1994

In this process of change demographic transition theory may be used to simplify the complex relationships between population growth and economic development. The theory consists of a generally accepted body of concepts about how the world or a country behaves demographically. It attempts to explain why all contemporary developed countries have more or less passed through the same three stages of demographic change over time. According to the original version of the theory, each population passes through three broad stages: Pre-industrial, Transitional and Industrial-urbanized. The pre-industrial stage is characterized by a regime of high mortality and high fertility while the transitional stage is one with low mortality and high fertility. Because the decline of mortality precedes the decline in fertility, there is a period during which population grows rapidly. As time goes by, however, fertility begins to decline and the reduction in the level of fertility continues until the country's population growth stabilizes at low levels of fertility and mortality. Although no two countries behave alike, none appears to become urban-industrial without passing through or at least entering the demographic transition.

The classic model, which may be labelled Demographic Transition Type 1, was closely associated with the Industrial Revolution and was essentially completed by the end of World War I followed by the Type 2 model. This is characteristic of countries moving through the entire trajectory much more rapidly than did the older industrial countries. The drop in mortality is more abrupt, and the fall in fertility, beginning from a higher level, is faster once it gets under way. As a result, the growth of population is two to three times what it was historically in Type 1.

As a model for predicting the future, the demographic transition has undeniable limitations and it is therefore less satisfactory for making population projections. However, for purposes of understanding what is going on, the theory of demographic transition still offers the best starting point. At the end of World War I, a group of Asian countries, Japan, Hong Kong, Singapore, South Korea and Taiwan, faced a bleak future. Their economies had traditionally been heavily dependent on agriculture, yet land was very scarce. Consequently, their population density was extremely high. Japan managed to move through most of its

demographic transition while other countries struggled with labour intensive activity that supported high numbers of people at or near the subsistence level. These countries, however, developed with incredible speed. On the demographic side, their total fertility rate fell from between five and seven children per woman to below replacement level within a relatively short period of 35 years, from 1950 to 1985 (see Leete and Alam 1993:20). If these countries could quickly reach a fertility rate of less than two children per woman, can others do it too, despite the starting conditions? Will they serve as a model for the rest of the developing world? Or will it prove impossible for many poor countries, particularly in sub-Saharan Africa, to travel that path?

Nearly all the countries are at the second stage of the demographic transition with high population growth rates well over 2.5 per cent per year. Notwithstanding, most countries are experiencing high infant and child and general death rates because of the persistence of widespread poverty and low levels of living. The latter are also perpetuating high birth rates and general population growth rates remain relatively high. Even in countries such as Kenya, Zimbabwe and Botswana where fertility is reported to be on the decline, the current levels of fertility are fairly high and population growth rates are high, 3.4 per cent in Botswana, 3.6 per cent in Kenya and 3.3 per cent in Zimbabwe (World Bank 1994). As we progress towards the end of the twentieth century, an important question is when and under what conditions are the African countries likely to experience significant mortality and fertility declines and slow population growth?

No one knows the answer, but from the demographic point of view the options are few. The rapid expansion of population in the subcontinent may have to stop somehow. It may stop because of a return to high mortality due to malnutrition, famine and poverty, conflicts (especially over land and resources) or other disaster perhaps stemming from the 'Tragedy of the Commons' or AIDS. Or it may be stopped as a result of a continuous decline in fertility to a low level, a condition possibly brought on by unbearable costs of childbearing due to the economic crisis. In what follows an attempt is made to assess the two major components of the demographic transition, mortality and fertility.

Mortality transition

As noted earlier on, medical and health technologies accelerated the decline in mortality during the 1950s and 1960s. The mortality rate for children under the age of five has been cut by half and life expectancy increased by more than a decade between 1956 and 1980. Infant mortality dropped to below 100 per thousand live births between 1970 and 1992 in fewer than half of the countries for which data are available (see Table 3). It is still relatively high in all countries except Botswana, Zimbabwe and Lesotho.

During the mid-1950s only one in seven Africans had access to safe drinking water, but 25 years later about half of the African population was obtaining drinking water from a safe source. By the end of the 1980s nearly half of all Africans could reach a modern health care facility within two hours.

Despite these achievements, however, life expectancy in Africa was only 52 years in 1992 compared with 64 years for all developing countries and 77 years for industrialized countries (UNDP 1993). The persistence of high mortality is reflected in figures presented in Table 2. In three-quarters of the countries, life expectancy at birth is less than 56 years and only three countries, South Africa, Lesotho, and Botswana, have average life expectancy of more than 60 years.

Africa's infant mortality rate is 1.5 times higher than in all developing countries and eight times higher than in industrialized countries. Within the continent, mortality differentials between and within countries are no less striking: mortality of children under five ranges from 254 deaths per thousand live births in Malawi, Mali and Sierra Leone to below 100 in

Zimbabwe and Botswana. Adult mortality, the risk of dying between ages 15 and 60, has been estimated to range from 18 per cent in Northern Sudan to as high as 58 per cent in Sierra Leone. In many countries, more than 30 per cent of females and 40 per cent of males of working age will die before the age of 60 (UNDP 1993).

Table 2
Expectation of life at birth 1992

Expectation of life at birth	Number of countries
<45	6
45-49	12
50-55	9
56-60	6
>60	3
Total	36

Source: World Bank 1994

Table 3
Decline in infant mortality rates (per 1,000 live births) in African countries-1992

COUNTRY	1970	1992	DECLINE (%)	COUNTRY	1970	1992	DECLINE (%)
Botswana	101	35	65	Mauritania	165	117	29
Benin	155	110	29	Mauritius	79	53	33
Burundi	182	129	29	Malawi	193	134	31
Burkina Faso	178	132	26	Mozambique	156	162	4
Cameroon	126	61	52	Namibia	118	57	52
C.A.R.	139	105	24	Niger	170	123	28
Chad	171	122	29	Nigeria	139	84	40
Côte d'Ivoire	135	91	33	Rwanda	142	117	18
Congo	126	114	10	Sierra Leone	197	143	27
Ethiopia	158	122	23	Somalia	158	132	16
Gabon	138	94	54	South Africa	79	53	33
Ghana	111	81	27	Sudan	149	99	34
Guinea	181	133	27	Tanzania	132	92	30
Guinea Bissau	185	140	24	Uganda	109	122	12
Kenya	102	66	35	Zambia	106	107	1
Lesotho	134	46	66	Zimbabwe	96	47	51
Madagascar	181	93	49	Zaire	158	96	49
Mali	204	130	36				

Source: World Bank 1994

Mortality differentials within countries are strong indicators of the prevailing inequalities in health status between urban and rural residence and among socio-economic groups. In Zimbabwe, for example, childhood mortality of urban residents is 45 per cent below levels in rural areas, and among urban dwellers in the Sudan, Togo and Uganda it is up to 20 per cent below rural levels. Children of married women with secondary education are 25 - 50 per cent less likely to die than children of women who have no formal schooling. Ethnicity also ranks

as a strong correlate of infant and childhood mortality differentials, even after controlling for education and occupation. At all levels of statistical aggregation, therefore, huge gaps are apparent in key health indicators.

Perinatal conditions and infectious and parasitic diseases are responsible for 75 per cent of infant deaths. Infectious and parasitic diseases are further responsible for 71 per cent of the deaths of 1-4 year-olds, 62 per cent of the deaths of children aged 5-14 years, and 53 per cent of adult deaths. Among older adults, cancer and circulatory system diseases prevail among those aged 45-64 years, and 65 years and older (World Bank 1991). Maternal mortality in Africa is very high and health problems are compounded by lack of frequent gynaecological checkups and care, and delay in treatment when infections occur. Africa also has the highest adolescent pregnancy rate in the world. Childhood mortality and morbidity are of particular concern because children are among the most vulnerable groups. Childhood health in Africa is threatened mostly by infectious diseases, particularly diarrhoea, acute respiratory infections, malaria and measles.

The structure of the causes of death indicates the lack of profound structural changes in the African socio-medical systems. A significant shift in the existing structure would require substantial improvements in agricultural and infrastructural capacity: safe water supply, sanitation, nutrition and especially education, which appears to influence some aspects of social behaviour including child care and reproduction. In some Asian countries where infant mortality has declined substantially, changes have occurred not only in the medical and health systems, for example in child care, but also in the social and economic conditions such as nutrition, standard of education and the level and distribution of income. Health conditions are therefore closely interrelated with the levels of socio-economic development, with public health programs and also with cultural beliefs and attitudes towards illness.

Infrastructural facilities

Access to clean water and sanitation significantly reduces mortality and morbidity. Many areas in sub-Saharan Africa, particularly the rural areas where the majority of the people live, are without safe water and are subject to insanitary surroundings with extremely limited transport and communication. Except in Botswana, South Africa, Zimbabwe, Cote d'Ivoire and Burkina Faso, less than 50 per cent of the sub-Saharan African population has access to safe water; the situation is even worse in the rural areas where more than 70 per cent of the population are unable to consume clean water (World Bank 1994). Most rural people depend on wells, rivers, streams, ponds and lakes as their source of drinking water. Available statistics also show that except for about four countries, most people have no access to adequate sanitation; in some countries, only between 2 and 20 per cent of the rural dwellers have access to sanitation. Access to power is also a major problem in the region. Less than one-half of the households have access to electricity sufficient for at least lighting except in a few countries, and in even in these countries electric supply breakdowns are frequent; ranging from six per cent in Botswana to 57 per cent in Nigeria. With the exception of South Africa (87) and Mauritius (56), the number of telephone exchange mainlines per thousand persons ranges from one in Niger, Chad and Mali to 13 in Zimbabwe and 21 in Botswana. Reported faults may rise to as high as 217 per 100 mainlines per year. With regard to roads the percentage paved and in good condition is relatively low in many countries and the World Bank estimates show that 'Timely maintenance expenditure of \$12 billion would have saved road reconstruction costs of \$45 billion in Africa in the past decade' (World Bank 1994). Thus, levels of infrastructure stocks in sub-Saharan Africa are woefully low in many countries. According to the recent World Bank study,

The per capita provision of infrastructure services has increased in all regions, the greatest improvements have been in East Asia and the smallest in sub-Saharan Africa; reflecting the strong association between economic growth and infrastructure (World Bank 1994).

This linkage is actually reflected in China's success story of rural enterprise that employs more than 18 per cent of the labour force and produces more than a third of national output. This success has been achieved with a minimum amount of transport, telecommunications and power at the village level.

In sub-Saharan Africa the levels of health infrastructure are also very low. The available information shows that 60 per cent of the region's population had access to health services during the 1987-1990 period; the corresponding figure for the urban areas was estimated to be 87 per cent (UNDP 1993). Most rural people lack basic health facilities. In many rapidly growing cities, expansion of health infrastructure is lagging behind population growth, which exerts great pressure on the existing facilities. High population growth rates have therefore contributed to the inability of African countries to expand, and, in some cases, even to maintain existing levels of health facilities. For example, in Burkina Faso, the number of health centres increased from 169 in 1980 to 860 in 1990; the number required in the year 2000 to maintain existing coverage, assuming one health centre serves 5,000 people, is 1,100 and to reach 60 per cent coverage is 1,400. In Mali the number needed to maintain the current low level of coverage in the year 2000 is nearly five times the increase of 52 health centres during the decade 1980-1990. Most countries face similar challenges and their population growth has led to a decline in health service coverage. In Nigeria, for example, one study found that in 1987 nearly 30 per cent of the equipment in health care institutions was not in service and in Ghana in the same year, only 167 out of 660 of Ministry of Health vehicles were roadworthy, 230 needed extensive repair, and 263 were worthless (UNDP/World Bank 1989). Hospital buildings in most African countries are in poor or unsatisfactory condition. Some hospitals, for example, Tres de Agosto Hospital in Guinea Bissau, declined beyond the point of repair (World Bank 1991) and in Angola, Mozambique, Somalia, Sudan, Liberia and Rwanda civil wars have damaged health infrastructures.

Regarding public health programs, most governments have not made much effort in translating the principles of primary health care (PHC) into a national policy. Community-based and intersectoral approaches to planning and operation of systems of health care have either not been successful or have not been vigorously pursued. The available information shows that in only five African countries have constraints in the enabling environment for health been addressed. Most governments have embarked on selective public health strategies, focusing on specific health problems such as immunization, tuberculosis and AIDS. Though these programs have had a positive effect, they have not been successful in providing quality care and promoting the use of specific interventions through social mobilization. The primary health care model has not therefore been applied on an extensive scale as an instrument of community development and as a result members of many communities have not been involved in the promotion of a healthier environment for the urban poor and rural dwellers (Gaisie 1989).

The above noted levels of economic infrastructure and of the existing health infrastructure in most of the countries in the region show that the traditional African social structures have not as yet changed much. Pursuit of good health and management or treatment of illness therefore are difficult because they are intricately related to the socio-cultural and economic structure of the society. The biomedical system has not as yet permeated the African social fabric, nor has the ethnomedical system faded away: many Africans still heavily depend on it for diagnosis and treatment of all kinds of maladies. The two systems are yet to be integrated.

It is clear that a country's mortality level is determined by a complex network of factors ranging from the levels of infrastructure through standard of education to cultural beliefs and practices. Many of these factors are largely functions of a country's cultural and historical heritage. Mortality levels and trends are therefore not governed solely by technology but by a plethora of cultural and socio-economic factors. The experience of some Asian countries such as Japan, Hong Kong and Singapore is quite relevant here. Massive declines in mortality were intimately bound up with very rapid economic growth and even where economic growth has been slow but policies have been aimed at satisfying the basic needs of most of the people (e.g. in Sri Lanka and Cuba), declines in mortality have been impressive. Thus, increasing the income of the poor, and expanding schooling, especially for girls and women, contribute a great deal to general household well-being and better health. But most African health systems are riddled with problems such as financial constraints, misallocation of funds, inequality and inefficiency that have hampered progress. Economic recession and structural adjustment programs have also contributed to the slowing down of improvements in mortality levels and progress in health; in consequence the movements through both health and mortality transitions have also slowed down.

Fertility transition

Malthusian perspective and other demographic-economic models

Nearly two hundred years ago, Malthus in the *Essay on the Principle of Population* invited his readers to accept the truth of two postulates: 'that food is necessary to the existence of man' and 'that the passion between the sexes is necessary and will remain nearly in its present state'.

These two laws, ever since we have had any knowledge of mankind, appear to have been fixed laws of our nature, and, as we have not until now seen any alteration in them, we have no right to conclude that they will ever cease to be what they now are, without an immediate act of power in that Being who first arranged the system of the universe, and for the advantage of his creatures, still executes, according to fixed laws, all its various operations (Malthus, ed. Flew 1970:70-71).

He proceeded to draw inferences from the postulates and the associated assumptions. Among the latter the most important was the inability of societies to increase food supply at more than an arithmetical rate in contrast to the tendency of population to expand at a geometrical rate unless checked. According to Malthus, poor countries would never be able to rise much above their subsistence levels of per capita income unless they initiated 'preventive' checks on their population growth. The only accepted means of preventing a birth was to exercise 'moral restraint' which was defined as abstinence from marriage, either for a time or permanently, from 'prudential' considerations, with a strictly moral conduct towards sex in the interval. This was the only acceptable behaviour for keeping population on a level with the means of subsistence and which was 'perfectly consistent with virtue and happiness'. All other checks resolved themselves into vice or misery. Thus, contraception, abortion and infanticide were viewed as vices.

In the absence of such preventive checks, positive checks which included 'all the causes which tend in any way prematurely to shorten the duration of human life' would inevitably provide the restraining force. Among the positive checks listed by Malthus were bad and insufficient food and clothing arising from poverty; bad nursing of children; a whole train of common diseases; epidemics, wars, plague and famine. The positive checks which appear to stem from the laws of nature he labelled 'misery' and those we bring upon ourselves such as

excess of all kinds, wars and many others that are within our power to avoid he referred to as 'vice' and their consequences were 'misery'. Malthus observed that a combination of some of these checks keep population within the realm of natural law. In the *Second Essay* he wrote:

The power of population being in every period so much superior, the increase of the human species can only be kept down to the level of the means of subsistence by the constant operation of the strong law of necessity, acting as a check upon the greater power (Malthus, ed. Flew 1970:250).

He believed that the cycle of increased food resources leading to population growth and then to too many people for available resources reverting to poverty was part of a natural law of population (the 'Malthusian Trap'). The only way to break the cycle was to change human behaviour, postpone marriage and sexual intercourse until a man was sure that he could support his family and by that avoid the miserable consequences of population growth.

In the Malthusian demographic-economic growth model therefore, population growth is seen as the dependent variable that is determined by technology as an autonomous factor in relation to population change. According to this theory, population expansion comes to a halt through increased mortality when the population reaches the subsistence limit of the newer technology.

In contrast to this theory is the Boserup model, which is the opposite of that of Malthus: population growth is here regarded as the independent variable that is a major determinant of agricultural development. By gradual change from agricultural systems where long fallow prevails to systems where no fallow is necessary, population within a given area can double several times without facing either starvation or lack of employment opportunities in agriculture. Boserup noted two mechanisms that are responsible for increase in output per man-hour both in agriculture and non-agricultural rural activities: intensification of agricultural activities may compel cultivators and agricultural labourers to work harder and more regularly and increasing population density facilitates the division of labour and the spread of communications and education (Boserup 1965). Thus, communities with sustained population growth stand a better chance of undertaking viable economic development than those with stationary or declining population. However, she added two caveats: (1) provided the necessary agricultural investments are made; and (2) this condition may not be fulfilled in densely populated communities, if the rates of population growth are high.

Boserup's model implies that population growth stimulates economic growth under certain conditions. Examination of the long historical processes of the changes in the relationship between population growth and technology led her to conclude that rising rates of population growth helped to accelerate the economic growth. Colin Clark (1957), the best known exponent of the idea that population growth is the trigger of economic development, points to the history of Europe in which industrial production and the increase in agricultural production were accompanied almost universally by population growth. Clark's argument is based on the thesis that population growth is the motivating force that brings about the clearing of uncultivated land, the draining of swamps, and the development of new crops, fertilizers and irrigation technologies in agriculture.

Julian Simon (1977) joined the group by formulating a thesis that a growing human population is the 'ultimate resource' for economic development. Inventiveness increases in proportion to the number of brains trying to solve problems. Coal replaced wood as a major source of energy only to be replaced by oil that may ultimately be replaced by solar or nuclear energy. To Simon, innovation moves *pari passu* with population growth, although moderate rather than rapid or very slow population growth is most conducive to an improvement in human welfare. In Europe, Japan and North America, there is a reasonable amount of evidence to suggest that population growth is beneficial to economic development.

Historical experience

In the eighteenth and nineteenth centuries, the early phase of modern economic development in North Western Europe, population and income increases accelerated together. Declines in mortality and, in some areas, increases in marriage rates as a result of new economic opportunities, led to population growth. However, Europe's rate of population growth rose from 0.5 per cent to 1.5 per cent per annum and the natural increase seldom exceeded the latter figure. In England it climbed to 1.6 per cent in the 1820s and in France it never rose above one per cent during the nineteenth century. Furthermore, the natural increases were partly siphoned off by emigration.

A similar demographic regime prevailed in Japan in the eighteenth and nineteenth centuries. Population grew slowly and economic growth exceeded population growth so that living standards gradually rose. Compared with Europe and Japan, North America, rich in natural resources and with good economic opportunities, experienced fast population growth in the nineteenth century. Fertility was relatively high and mortality was low; these conditions together with heavy immigration from Europe led to a rate of population growth well above two per cent per annum in the early 1800s. But fertility began to decline earlier than in Europe so that the population growth rate fell below two per cent by the beginning of the twentieth century. About one-third of the total growth in population during 1850-1910 was attributed to immigration.

The European-American experience shows that population growth can be accommodated or contained up to a point. In other words, under certain conditions moderate population growth can be beneficial.

The developing world

As for the developing world, many experts regard the rapid population growth rates now prevailing in much of Asia, Africa and Latin America as serious obstacles to efforts to develop national economies and improve the general well-being of most of the world's people. In general, income levels rise faster in countries where population growth is occurring moderately or slowly. Countries with rapid population growth must spend most of their national income on providing necessities rather than using it for more productive purposes. For instance, high growth rates increase the need and demand for all manners of public services: welfare, education and health facilities and employment opportunities, causing governments to divert capital to the provision of these services instead of investing it in more productive endeavours.

The most acute economic crisis is encountered in sub-Saharan Africa. The consequences of rapid population growth are compounded by economic crisis and environmental degradation. Fall in per capita incomes, rapid increases in population, loss of export revenues, curtailment of foreign investments, destruction of the fragile ecosystem and inability of many countries even to feed their people and provide basic human needs lie at the heart of the African dilemma. The available economic and social indicators show that the region has been experiencing economic disasters for more than a decade and the prospects for the 1990s are very bleak (see Table 4). The average annual growth rate of GDP of 3.6 per cent in the 1970s declined to 1.8 per cent in 1992. With the exception of seven out of the 28 countries listed in Table 4, population growth outstripped economic growth during the 1980s. The World Bank's estimates indicate that the GDP will be increasing at a rate between 0.3 and 0.5 (World Bank 1991). It is the only region where the World Bank projections indicate that the percentage of the population living in absolute

Table 4
Population and economic growth in sub-Saharan Africa, 1970-1992

Country	1970 - 1980		1980 - 1992	
	Average annual population growth rate (%)	Average annual growth rate of GDP (%)	Average annual population growth rate (%)	Average annual growth rate of GDP (%)
sub-Saharan				
Africa	2.8	3.6	3.0	1.8
Botswana	3.7	14.5	3.4	10.1
Benin	2.7	2.2	3.1	2.4
Burkina Faso	2.1	4.4	2.6	3.9
Cameroon	2.9	7.2	2.8	1.0
C.A.R.	2.2	2.4	2.6	1.1
Chad	2.0	0.1	2.4	5.3
Côte d'Ivoire	4.0	6.8	3.8	0.0
Congo	2.8	5.8	3.1	2.4
Ethiopia	2.6	1.9	3.1	1.2
Gabon	4.6	9.0	3.4	0.5
Ghana	2.2	-0.1	3.2	3.4
Kenya	3.7	6.4	3.6	4.0
Lesotho	2.3	8.6	2.7	5.4
Mali	2.1	4.9	2.6	2.9
Mauritania	2.4	1.3	2.4	1.9
Mauritius	1.5	6.8	1.1	6.2
Malawi	3.1	5.8	3.2	2.9
Niger	2.9	0.6	3.3	-0.7
Nigeria	2.9	4.6	3.0	2.3
Rwanda	3.3	4.7	2.9	1.4
Sierra Leone	2.1	1.6	2.4	1.3
Somalia	2.9	4.8	3.1	2.4
South Africa	2.7	3.0	2.5	1.1
Sudan	2.9	5.6	2.7	-
Tanzania	2.9	3.0	3.0	3.1
Zambia	3.0	1.4	3.2	0.8
Zimbabwe	2.9	1.6	3.3	2.8

Source: World Bank 1994

poverty will rise from 47.8 per cent (216 million) in 1990 to nearly half of the total population (49.7 per cent or 309 million) in the year 2000 (World Bank 1992:30). The most threatening of the problems noted above is the inability to feed ourselves in the face of abundant natural capital, i.e. natural stocks that yield flows of natural resources and services, land and labour being the crucial ones in food production. The food problems faced by sub-Saharan Africa have been dramatized in three major food emergencies since the late 1960s: the Sahel drought, 1968-1972; East and Southern Africa, 1970-1980; and Southern and East Africa in 1983-1984. The 1983-1984 food emergency affected as many as 24 countries which experienced serious food problems. This was followed by another major food emergency in 1984-1985, affecting some 20 countries. The 24 countries include some that were affected by

the 1991-1992 drought: Benin, Botswana, Cape Verde, Chad, Ethiopia, Gambia, Ivory Coast, Lesotho, Mauritania, Mozambique, Rwanda, South Africa, Senegal, Swaziland, Togo, Zambia, and Zimbabwe, and also countries with more chronic food problems such as Angola, Somalia and Tanzania. In 1984-1985, food emergency countries were: Burkina Faso, Cape Verde, Chad, Mali, Mauritania, Niger, Senegal, Burundi, Ethiopia, Kenya, Rwanda, Somalia, Sudan, Tanzania, Angola, Botswana, Lesotho, Mozambique, Zambia and Zimbabwe. These emergencies highlight Africa's precarious agricultural situation.

Agricultural production has completely stagnated since the 1960s: the average annual growth rate of agricultural production has been two per cent since 1965. Ethiopia (-0.1), Rwanda (-1.5), Lesotho (-0.7), Angola (-0.5), Namibia (-1.0) and Botswana (-4.0) experienced negative growth rates during the decade 1980-1990 (World Bank 1992) while the growth rates declined in most countries in sub-Saharan Africa.

The weak performance in food production has major implications for most African countries, given high population growth rates of three per cent and above, and high urbanization rates. Yet it appears it is on agricultural development, as it interacts with fertility, mortality and rural-urban migration, that prospects of movement from the second into the third stage of the demographic transition will largely depend.

Regulation of population growth

In his later writings, Malthus somewhat modified his stance on population response. He had always recognized that 'misery' could be avoided, not just by undesirable 'vice' but by 'restraint', especially delayed marriage. Whilst Malthus-prescribed regulation of population growth is located at the beginning of the reproductive period as 'starting patterns' such as postponement of first sexual union and celibacy, regulation in African societies is situated in the middle as 'spacing patterns' and the end as 'stopping patterns'. These include the duration of the non-susceptible period, duration of postpartum abstinence and early terminal abstinence. These patterns of preventive checks are linked to patterns of kinship organization and agricultural production. In traditional sub-Saharan societies women perform two crucial functions; they are simultaneously major agricultural producers and procreators on behalf of the corporate kinship groups. This dual function is institutionalized through normative prescriptions relating to behaviour. The reproductive function is so crucial to both individual women and their kinship groups that the status of adulthood for women is also completely contingent on motherhood and the last instalment of bridewealth (*lobola*, *bogadi*) is often transferred upon the birth of the first child. Among the Bemba and Luvale in Zambia, for example, marriage is regarded as a means by which a woman's fertility may be tapped for the benefit of her matrilineage; fertility is emphasized in their rituals as a source of new members for the matrilineage. Among the Tswana 'It is her duty to bear and nourish children for him' (Schapera 1966). Such was the typical institutional arrangement for reproduction.

Various combinations of nuptiality and child-spacing patterns have given rise to different levels of fertility: total fertility rates of between six and seven are a common feature of West African societies, and rates between five and eight in several parts of Tanzania and Kenya Rift Valley are the outcome of shorter non-susceptible periods. In Southern Africa, a combination of long postpartum non-susceptible periods, relatively late marriage and low rates of remarriage with a fairly low proportion of childlessness has produced total fertility rates that are low by African standards. Swaziland's high estimated total fertility rate of seven is attributed to less emigration by men and therefore less loss of exposure to pregnancy (Lesthaeghe 1986).

Weakening of old preventive checks

The information collected in the various fertility surveys including the recent Demographic and Health Surveys in sub-Saharan Africa shows that the components of general exposure and child-spacing have undergone some transformation. A pattern has emerged of reduced postpartum non-susceptible period because of increases in the individual and contextual levels of education. For instance, the 1979-1980 Ghana fertility survey data show that the rural areas experience the longest durations of breastfeeding, postpartum abstinence, postpartum amenorrhoea and the overall postpartum non-susceptible period, followed by the urban areas and the cities. There is an inverse relationship between mean durations of postpartum variables and the number of years the mother spent in school. For instance, the postpartum non-susceptible period among women with no formal education is four months longer than among primary and middle school leavers and seven months longer than among secondary and tertiary graduates. The average durations of breastfeeding range from 21 months among the women with no formal schooling to 18, 16 and 12 months among the primary, middle, and secondary and over groups respectively (see Gaisie 1984).

In Zambia, a comparatively long non-susceptible period is noted among rural women and those with no formal education while a second pattern of relatively moderate duration of non-susceptibility and little use of modern and effective contraceptives is depicted by the data for women with primary education and resident in the less urbanized provinces such as Eastern, Central and Northern Provinces.

The third pattern of relatively short non-susceptible period is noted among urban women with secondary or higher education and resident in the most urbanized provinces, Lusaka and Copperbelt. The same patterns are noted among Tswana women. Durations of breastfeeding, amenorrhoea, abstinence and non-susceptible periods are longer in the rural areas than in the urban areas (Botswana 1989:17).

The African populations are therefore gradually passing through a first phase in the modernization of their reproductive regimes as reflected by the changes in the levels of the proximate determinants of fertility, a gradual weakening of the old preventive checks (i.e. child-spacing) but this is not fully compensated for by the new checks of late marriage and greater use of contraception. The only places where there is sufficient compensation for the diminishing old checks are urban concentrations with high average education and better educated zones located in the regional or provincial capitals. A decline in fertility usually occurs among women with at least some secondary schooling while an education below that level tends to produce more of an increase in lifetime fertility. All indications point to a delayed second phase of the fertility transition, a phase characterized by falling general fertility.

Social change and incipient fertility decline: the pace setters

Besides the need for significant changes in the fertility components themselves, certain aspects of the social organization are likely to militate against early onset of the second phase of the fertility transition. An important basic feature of the modernization of social groups in Africa is the persistence and recrystallization of the various traditional structures. In consequence, traditional or ethnic frameworks become the most important determinants of the degree of adjustment to modern conditions including changes in reproductive behaviour. For instance, aspirations towards higher standard of living and rising costs of childbearing are compelling urban women in Lomé, the capital of Togo, to limit their family size to four living children. But many of these women use spacing and traditional methods such as periodic or prolonged abstinence rather than stopping or modern contraceptives to achieve the preferred family size. The emergence of alternative living arrangements under which the spouses live in separate residences or compounds is another example of adaptive behaviour in changing social and economic conditions (Ekouevi 1994:133-134). Rural Sierra Leoneans 'adjust the

timing or spacing of their births, rather than preventing births' and families use diverting and adaptive ways of managing the costs of childbearing rather than reducing fertility (see Bledsoe 1994:130). There are various paths to social change and they are largely determined by historical and socio-cultural factors (see Ekouevi 1994; McNicoll 1994).

In Botswana, labour migration, missionary activities and contacts with European traders engendered many changes in the Tswana family. The closely knit co-operative socio-economic unit was made economically less self-sufficient and was judicially and administratively dismembered (Schapera 1947). Among the various factors labour migration was the most devastating. Though it contributed to the general welfare of the people, it undoubtedly weakened the family structure; most married migrants left their wives behind and as a result migration led to a long period of separation of husband and wife. Young women had to wait for several years after puberty before they were married. Labour migration also spread infectious diseases and loosened sexual morals. Domestic control broke down with the prolonged absence of the father in the mines; children tended to do much as they liked and took little notice of their mother, especially if she had a lover. Schapera observed that 'It is possible however... that even more children would be born were it not for migration' (Schapera 1947:129).

The disorganization of the family and associated changes in sexual and reproductive behaviour contributed a great deal to the breakdown of the institution of marriage. According to the 1991 Botswana Census results, 66 per cent of women aged between 20 and 44 years had never been married; the corresponding figure for males between 25 and 54 was 59 per cent. The proportion of women who had never married ranged from 88 per cent among the 20-24 year-olds to 39 per cent among the 40-44 year-olds. In the age group 30-34 years, seven out of ten males had never married and nearly one-third of those in their mid-forties were single.

Changes in the traditional family structure also led to the creation of a sizable proportion of female-headed households. In 1991, 47 per cent of the households were headed by women and 46 per cent of the female headed households had no cash earning members in the family, only 43 per cent receiving money remittances from within and outside the country. The proportion of the households in the urban districts headed by women ranged from 32 per cent in Selibe-Phikwe to 41 per cent in Francis Town and the proportions with no cash earning members ranged from eight per cent in Gaborone to 17 per cent in Francis Town and Lobatse.

The rural districts have the highest proportions of female-headed households. In Ngwaketse district, 55 per cent of the households are headed by women and 60 per cent of them have no cash earning members with only 24 per cent receiving remittances. In settlements such as Lesenepole and Kalamare nearly seven out of ten households are headed by women and between six and seven out of ten of these households have no cash earning members.

The effect of economic development is manifest in various aspects of life. The per capita GDP has increased by seven times since independence; rising from 578 Pula in 1966 to 4,115 Pula in 1988/1989 (Republic of Botswana 1991:13). The per capita GNP nearly quadrupled between 1980 and 1992; increasing from US \$792 to US \$2,790 at an annual growth rate of 6.1 per cent (UNDP and World Bank 1989; World Bank 1994), the highest in Africa besides Gabon.

Since the attainment of political independence, the government has been investing millions of Pula a year in infrastructure. The result has been a substantial increase in roads, power, water, telecommunications, sanitation, transport, education and health services.

Female schooling is an important feature of the Tswana society: nearly three-quarters of the pupils enrolled in the schools in the 1940s were girls. The system of cattle management under which boys had to spend a greater part of their youth at cattleposts was largely

responsible for the wide gender gap in formal education (Schapera 1947). The proportion of males aged five years and over who had left school increased from 16 per cent in 1971 to 28 per cent in 1981 and 36 per cent in 1991. The corresponding figures for the females are 22, 35 and 41 per cent. However, the gender gap with respect to the educational level attained has been rapidly closed over the past two decades. The proportion of males completing secondary education increased from nine per cent in 1971 to 22 per cent in 1991 and that of females rose from eight per cent to 23 per cent during the same period. In 1981 only 0.4 per cent of females progressed beyond the secondary level compared with 1.3 per cent of males but the 1991 census figures show that the gap has been substantially bridged with proportions now at 3.8 per cent for males and 2.0 per cent for females.

Data on average parity at different levels of educational attainment show that fertility is negatively related to level of education. A reported completed family size of between 6 and 6.6 children among women with between one and four years of schooling and those without any formal education declines monotonically to 2.7 among the women with higher or tertiary education. Such fertility differentials are characteristic of early stages of fertility decline and, with the rapid expansion of female schooling in Botswana, a sustained reduction in fertility is imminent.

The socio-economic development has been accompanied by movement of women from occupational groups with little motivation to groups with strong motivation for family limitation. The proportion of professionals among the women climbed from 7.4 per cent in 1981 to 13.4 per cent in 1991 and the proportion of administrators increased from 0.2 to 1.4 per cent. The proportion of clerical workers also rose from 4.6 to 9.6 per cent while sales and service workers dropped from 19.4 to 12.6 per cent and those engaged in agricultural activities from 62 per cent to 52 per cent. It is the change in the occupational structure and not the increase in income that motivates a reduction of fertility. Motivation for family limitation is much stronger among employed women than among the unemployed (Gaisie 1995:23).

In 1990, about 80 per cent of the rural villages had access to potable water and about 85 per cent of the rural population was within 15 kilometres of a health facility. The ratio of doctors to population increased from 1:20,000 in 1965 to 1:5,804 in 1989 and that of nurses to population from 1:17,000 to 1:554 during the same period. By 1989, the school enrolment rates for primary and secondary school had risen to 90 and 30 per cent respectively. The 20km of tarred roads in 1965 increased to 2,664km in 1990 and there were 8,328km of national roads in that year. The number of telephone subscribers increased from 11,000 in 1985/1986 to 22,000 in 1989/1990 (Republic of Botswana 1991).

Besides providing infrastructure, the government also adopted various measures that have facilitated the achievement of individual demographic goals though it does not have an explicit population policy at the time of writing. Nonetheless, Botswana's family planning program is rated the strongest in Africa and one of the strongest among the developing countries, ranking eighth after China, Republic of Korea, Taiwan, Thailand, Sri Lanka, Indonesia and Mexico (Ross 1992:80).

Family planning services were offered as far back as 1973 on a relatively small scale and it was not until 1980 that a concerted effort was made by the Ministry of Health to extend integrated Mother and Child Health-Family Planning (MCH-FP) services on a daily basis at clinics in all parts of the country. By 1988, 77 per cent of the clinics were providing these services. In the second half of the 1980s training of health and family planning personnel intensified, with the development of family planning guidelines, service standards and manuals for family planning (see CSO 1984, 1988). It is therefore not surprising that a significant decline in fertility began in the 1980s. The MCH-FP program made a substantial contribution to the fertility decline. It facilitated changes in reproductive behaviour by engendering a significant shift from traditional to modern methods of contraception. The

proportion of all women who had ever used at least one modern method increased from 34 per cent in 1984 to 54 per cent in 1988; the corresponding figures for women in unions are 37 and 60 per cent. During the same period the proportion of women currently using modern methods rose from 16 per cent to 29 per cent. An explicit population policy and active involvement of the government in the national family planning program would help to sustain the decline.

Recent estimates show that the fertility level appears to have remained fairly constant during the 1970s with a Total Fertility Rate of 6.5 (see CSO 1972:175). The downward trend began in the late 1970s and continued in the 1980s with the TFR dropping to 5.7 in 1988 and 5.2 in 1991. These estimates suggest that fertility declined by 11 per cent between 1981 and 1988 and by 8.8 per cent between 1988 and 1991 or a decline of about 19 per cent during the decade (see Gaisie 1995); this figure is higher than the 10 per cent decline that is now 'conventionally accepted as indicating an onset of irreversible fertility transition' (Caldwell, Orubuloye and Caldwell 1992:211).

Although Kenya adopted an explicit policy to reduce rapid population growth in 1967, the country had to wait for two decades before beginning a fertility decline. The decline has been attributed to 'the increased use of contraception to control births' (Brass and Jolly 1993), a simplistic explanation that ignores completely other equally important factors in the historical and cultural heritage as well as in government policies and programs which transformed social and economic conditions in Kenya during the two decades following the attainment of independence. The massive investment in physical infrastructure — roads, transport, water, sanitation, communications — and in human capital such as education and health was fundamental in creating the conditions that started the decline in fertility. Once there are solid social and economic reasons for controlling births, people will use any methods available. Economic reversal is a new candidate and should not be presented as the major determinant of fertility decline (Mback, 1994). Transitory behaviour may change with improvements in the economic performance.

In Zimbabwe, the significant social change that the traditional social system has undergone mostly began as a response to the oppressive pre-independence conditions and the organizational structure of the liberation struggle. The armed struggle, for instance, demanded the use of contraceptives in the bush.

We have adopted what we want from Western culture into our revolution and we are aware of the fact that people have sexual feelings in spite of the dangers of the struggle. It was possible for us to get abortions. We had to face reality of the conditions we were in (Davies 1983).

The motivated women advised their male comrades that it was 'necessary to use contraceptives, and that to be sent back to Mozambique for five months to have a baby was a set back to the war'. The young boys (*mujibhus*) and girls (*chimbwidos*) who acted as eyes and ears for the freedom fighters and performed a network of secret functions for the guerilla forces were also exposed to the changing environment.

The returning fighters had the onerous task of convincing their mothers and grandmothers that the changed attitudes towards contraception and abortion were in the interest of the young generation who had to spend a good part of their reproductive lives in the bush. The liberation war also eroded some of the props of the low status of a female in the traditional society: 'The position of women has really changed through the armed struggle because now we have equal positions and equal education' (Davies 1983).

The organizational capacity developed during the war was also used in establishing a variety of women's clubs and co-operatives that were concerned, among other things, with adult literacy, income generating and traditional 'home economics' activities. The Women's Bureau and Ministry of Community Development and Women's Affairs provided the structural framework for articulation and resolution of women's social, economic and political

issues (Mazur and Mhloyi 1994). Thus, shifts in the traditional social system because of the effect of external forces, development of organizational capacity and a very strong political will made a major contribution to the incipient fertility decline in Zimbabwe.

A rigorous analysis of the Zimbabwean data shows that there has been a modest decline in fertility, from about 7.1 children per woman in 1985 to 6.5 in 1987/1988 (Udjo 1993:107). A life table analysis of birth intervals shows that the decline is mainly in high-order births: fifth to sixth and sixth to seventh births. Udjo also noted that in view of the 'ineffective use of contraceptive by single women that is evident from the high proportion of premarital births' and the fact that a sizable proportion of women in the 'reproductive age group never use contraception (nor marry), any emphasis on *currently married women* in examining contraceptive use is misleading and inappropriate'. Thus, the pattern of contraceptive use during the family building process in Zimbabwe is consistent with the modest decline in fertility (Udjo 1993:108).

However, the most important observation in the three countries is that the decline in fertility has been, to a large extent, started by institutional changes that affect the reproductive behaviour.

Integrated approach

The interrelationship between mortality and fertility as reflected in the demographic and socio-economic developments in Botswana, Zimbabwe and Kenya suggests the desirability of an integrated approach to the study of demographic trends in sub-Saharan Africa.

Mortality transition appears to have stalled and fertility transition is being delayed by lack of substantial internal structural transformations. High mortality and high fertility are causally linked in many ways. Durations of breastfeeding and postpartum abstinence, and the need to replace children who have died in infancy all depend, to a large extent, on how long the infant survives. Thus, when mortality declines the desired number of children also falls, but the adjustment does not occur immediately because it takes some time before many people become aware of the prevailing level of infant mortality. On the other hand, short birth intervals, very early and very late childbearing, high birth order and large family size are some of the factors that influence the probability of survival: mother's and child's health, demands on mother's time and that of her relatives are all associated with fertility levels. High infant mortality and high fertility therefore interact with each other in many ways within socio-economic and institutional contexts. An integrated assessment of mortality and fertility processes throws much more light on the demographic transition as an aspect of the general socio-economic development in sub-Saharan Africa.

European experience shows that profound political and economic changes, such as industrialization, international trade and increase in the real value of wages, preceded and, as it were, prepared the ground for the demographic transition of the last quarter of the nineteenth century. There is a general observation also from European history that the pre-industrial homoeostatic demographic regime was dislocated by a mortality decline and that a decline in mortality is a necessary precondition of fertility decline (Chesnais 1992:399). Furthermore, mortality decline appears to have been often, if not always, associated with the spread of education, particularly among females. In sub-Saharan Africa, demographic trends in Botswana and Zimbabwe as outlined above attest to the fact that developing basic infrastructure and investing in the key social sectors such as health and education are necessary conditions for declines in both mortality, especially infant mortality, and fertility. The prevailing socio-economic conditions in most African countries make it extremely difficult to critically assess the timing and the pace of sustainable demographic transition, including even the movement through the mortality transition.

Female primary school enrolment in the area increased from 44 per cent in 1970 to 58 per cent in 1991. In the same period female secondary enrolment trebled from 5 per cent to 16 per cent. The proportions of female primary school enrolment ranged from 93-121 per cent in Botswana, Lesotho, Kenya and Cameroon to 21-24 per cent in Mali, Ethiopia, Guinea and Burkina Faso in 1991. Universal primary education will be far beyond the reach of many African countries for many years to come. In 1991, except in Botswana (57 per cent), Zimbabwe (45 per cent), Uganda (35 per cent), Kenya (25 per cent), Lesotho (30 per cent) and Ghana (29 per cent), less than one-quarter of girls of secondary school age (12-17 years) had access to secondary education (World Bank 1994). Enrolment rates stagnated or fell in the 1980s in some countries that had been doing well. For example, gross enrolment rates fell from 93 per cent in 1980 to 63 per cent in 1987 in Tanzania, and from 94 per cent to 76 per cent in Zaire. Among women, only one in three in the subcontinent is literate. Massive investment in human capital is therefore a major challenge in the years ahead.

As noted above, levels of health infrastructure stocks are low and declines in the existing ones are slowing the mortality transition. The available data show that education and health programs have come under severe financial pressure in the past decade. Although the share of education and health expenditures in GDP increased slightly for the subcontinent as a whole, in more than half of the countries for which data are available, public expenditure for education and health as a percentage of GDP fell between 1980 and 1985. Besides limited institutional and organizational capacity for delivery of education and health services as well as other social services, the financial constraint is so severe that it would be difficult for most countries in sub-Saharan Africa to provide these services without external assistance. The implications for demographic transition are obvious.

Influence of development strategies

Governments in the Third World tend to influence fertility partly through programs designed to promote or reduce fertility, and partly by their choice of development strategies. Most countries in the South and East Asia region promoted both industrialization and agricultural development. Consequently, they experienced large structural changes in both the urban and the rural labour markets.

In some Asian countries therefore, including Malaysia and Thailand, economic change, increase in age at marriage and improvements in female status led to large declines in fertility (Jones 1981); particularly in the urban formal sector. Asian countries pursued policies for the resolution of problems of high population densities and high pressure of population on land. When population growth accelerated in the period after World War II, governments became concerned about how to achieve an adequate increase in food supply. Almost all of them, therefore, promoted rural development and technological change in agriculture by provision of credit facilities, subsidies and direct investments. The Asian type of agricultural development places emphasis on irrigation, multi-cropping and labour-intensive methods and as a result output per hectare increased and so did the demand for labour. Furthermore, a number of Asian governments including India transformed tenants into owners and organized settlement schemes in areas of relatively low population density. Though there was some replacement of female and child labour by chemical and mechanical inputs, there is still a demand for labour in small-scale agriculture. In Asia, occupational changes in the urban market and rapid increase in the proportion of population living in large cities have been the major causes of fertility reduction within the urban industrial enclaves. At the same time, government promotion of rural development and fertility control motivated many peasants to use family planning, including late marriage. Development strategies of most Asian governments therefore contributed a great deal both to the reduction of fertility and mitigation of the effects of increasing population on resources.

African governments have also been interested in industrialization, but because of lack of adequate capital, management problems and poor infrastructural facilities, efforts at industrialization have not been successful. As a result only small proportions of their populations have experienced structural changes such as shifts in occupational structure in the urban areas. The African traditional system has undergone substantial changes, especially since World War II. There have been, for example, structural transformations with respect to land tenure and tendency towards private ownership, cash crop production, monetization of the economy, modernization of technology, legal reforms and rapid urbanization. All these modern transformations have been grafted upon a highly diversified set of older institutional arrangements in kinship and economic organization and cultural systems. In this long process of change, our farmers have not been particularly well integrated into the cash economy. They cultivate crops destined for remote markets and make some use of purchased tools, chemicals and wage labour. At the same time they continue to grow their own food supplies and organize their work around hoe and cutlass technology and inherited kinship systems. Most of the farmers are still engaged in subsistence agriculture, but with reduced fallowing and increased fragmentation. Governments' agricultural development programs often have a poor record and have not managed to close the gap between food production and population growth or to generate sufficient earnings to finance food imports. Technological progress in improving staple food production has been limited. Production is predominantly rainfed so it is difficult to cultivate improved seed varieties which have been developed predominantly for irrigated areas. Local specific factors such as diseases, and soil types have limited the transfer of improved varieties. Production is labour intensive, and labour is frequently the limiting factor of production. Research and other institutions are ill-placed to supply effective small holder technologies. The rapid population growth coupled with uneasy transition of resource management from local communities (i.e. kin, lineage etc.) and chiefs to individuals or governments, have increased the pressure to over-exploit grazing land. The difficult transition from past subsistence farming to enhanced market orientation underpins, to a large extent, the slow mortality transition and high fertility levels.

Development and population policies revisited

The rapid expansion of population in sub-Saharan Africa will have to stop somehow. We have, at least, two options. It may stop as a result of return to high mortality due to malnutrition, famine and poverty, or other disasters, perhaps stemming from the 'tragedy of the commons'. Or it may be stopped by the prevailing economic crises in many parts of the subcontinent that will force families to accept family planning. The first possibility appears to have been temporarily prevented by heavily subsidized food exports and food aid from industrialized countries. The United Nations Food and Agriculture Organization (1994) figures show that in 1993, most countries in sub-Saharan Africa obtained most of their cereal requirements as commercial imports and food aid: the proportions range from 44 per cent in the Sahelian countries to 98 per cent in Southern Africa. In Eastern and Southern African countries, about two-thirds of the requirements were acquired in food aid. Nearly one-half of the Sahelian requirement was met with food aid. Food aid is, at best, a temporary measure and can, at worst, be used as a political weapon. Food aid is somewhat similar to the poor laws of England during the eighteenth century, which Malthus believed had the tendency to

increase population without increasing the food for its support... they may be said therefore in some measure to create the poor which they maintain... A poor man may marry with little or no prospect of being able to support a family in independence (Malthus ed. Flew 1970:97).

Roman state charity fed thousands of underemployed citizens on imported grain; a policy that undermined Italian agriculture and kept a large population on the edge of subsistence, thus promoting 'disease, corrupt manners and concubinage'.

In the face of widespread poverty, malnutrition and high infant and child mortality in the subcontinent, it cannot be denied that Malthusian positive checks are, to some extent, operating. The forced acceptance of family planning is the second option that the subcontinent may have to adopt in order to extricate itself from the Malthusian trap. Societies everywhere at all times have provided distinctive solutions to the dilemma of population by manipulating their moral and political economies and in the process largely avoided misery and abject poverty. Africa appears to fit the Malthusian formulation better than the optimism of the demographic transition model. And the region does not exemplify the Boserupian type of technological adaptation generated by population pressure.

For the elimination of positive checks, that is, a return to high mortality because of poverty, famine and malnutrition, and forced acceptance of family planning, a variety of conditions must be fulfilled, two of which are the building of basic infrastructure and rural development.

New development and population policies are therefore required. On the development side, there is a need for a 180° turn in our choice of the required development strategy: towards a pursuit of viable and sustainable rural development. Two broad policies are required to attack the underlying causes of poverty, famine, and low status of women; neither policy will be sufficient on its own. First, urban-industrial development and rural development must be positively linked by correcting the lopsided or urban-biased industrial development strategy, improving access to resources and technology, and promising equitable income growth.

The more important policy relates to reduction of poverty: not only is attacking poverty a moral imperative, but it is also essential for population management. The strong and growing evidence of the links between poverty reduction and fertility makes a compelling case for programs to reduce poverty and population growth. Policies justified on economic grounds can deliver substantial demographic benefits. With prudent macro-economic policies that promote balanced development in both urban and rural areas and equity in income distribution, it is easier to change demographic behaviour. Expanding the access of poor people to health and family planning facilities will help reduce population growth. And better educated people can more readily adopt reliable and complicated family planning techniques.

Thus, strong macro-economic policies complement and reinforce population management. But these policies are not enough to ensure sustainable development; strong public institutions for implementation are also essential. Culture, religion, law and politics affect institutions and these in turn affect the economy and in consequence stifle demographic transition. Recent research suggests that the superior performance of Japanese manufacturing stems partly from norms of behaviour that promote the flow of information between workers and supervisors. Policy reforms and institutional changes are therefore required to bring about accelerated balanced development and better population management. We should not, however, underestimate the effect on Africa's development of the international economic order and its associated adverse effects.

There are policies targeted at specific development problems: diversification of rural employment or economic opportunities to generate incomes for the rural poor households; provision of infrastructural facilities including production and marketing incentives. A rural development policy must seek a compromise between the labour-intensive and appropriate modern input technologies in order to ensure sustained increase in employment opportunities and rural per capita income.

There is a need for an explicit and comprehensive population policy and strong family planning and reproductive health programs. A recent study of the strength of the programs in the region shows that out of 38 countries, only Botswana and Mauritius have strong programs and five (South Africa, Kenya, Zimbabwe, Ghana and Zambia) have moderate programs. The majority of them have weak programs and the remainder have very weak programs or none at all (Ross 1992). The failure of most of these programs to achieve their targets has been attributed to a number of factors relating to supply and demand aspects of family planning services, management constraints and lack of strong political commitment. The importance of the role of culture in programs is either regarded as residual or not mentioned at all in most evaluation studies undertaken by international organizations or individual scholars. But lessons drawn from the Asian experience show quite unequivocally that culture affects nearly all aspects of fertility and family planning.

One important aspect of the link between kinship and fertility is the area of relations within the family. How much is the value of children to parents changing? In situations where economic insecurity is widespread children may be the best insurance against risk; providing among other things, substantial support to parents in their old age, stabilizing marriage, assisting in production of food crops and determining the woman's status in the society: her prestige and power largely depend on the number of children she has borne. Such unfavourable economic conditions make it difficult to implement a family planning program, since women are unwilling to refrain from having large families under such conditions. In rural Sierra Leone

It is less the case, then, that people are poor because they have many children; rather, because people's economic and political situations are so unstable, they need numerous children (Bledsoe 1994:130).

Furthermore, lack of substantial change in family structures in respect of financial management and decision-making, even among the urban middle class, is bound to affect the implementation of family planning programs. It is perhaps important to reiterate that there has not been any fundamental transformation of the economies of Africa, the pace of change in family relations tends to be slow, kinship systems have proved resilient in their adaptation to change and they have sustained people in new and critical life situations in towns and cities. Family planning programs in sub-Saharan Africa have been influenced by this pattern of social change. Modern contraceptives are a facilitating agent; they are not structural agents of social change, and as observed by McNicoll, 'means of contraception and ways of delivery are secondary issues' in fertility reduction enterprises (McNicoll 1994:218).

The challenges ahead

The demographic trends in Africa should be assessed from the perspective of its historical and cultural heritage and international economic environment and their continuing effects. With deep-rooted structural deficiencies, limited institutional and organizational capacity, limited financial resources, inadequate economic infrastructure, underdeveloped human resource base, low levels of health and education infrastructure stocks and heavily urban-industrial based development strategies, movement through the demographic transition is a difficult task. Mortality declines have been stalled by economic crises and attendant structural adjustment programs have increased rather than decreased the number of Africans living in abject poverty. Massive declines in mortality will be brought about by rapid economic development and policies designed to satisfy the basic needs of the greater number of the people. The region therefore needs substantial investment in the key social sectors such as health and education. Restructuring of health systems to enable health for all is needed for

rapid movement through the mortality transition; tempo and period of completion are not easy to forecast under the existing health and economic conditions.

Regarding fertility transition the unknown quantities in the equation are many. It is quite evident from history that fertility decline is a matter of motivation. Fertility had declined in certain societies without the use of modern contraceptives. Fertility decline can therefore occur without family planning but it cannot occur without socio-economic development. A World Bank study shows that the effectiveness of birth control programs is determined by factors preceding program efforts, and not by the particular methods used (Faruquee 1979). Motivation to use contraceptives is determined mainly by the extent to which the advantages of large family size are eroded by transformation in the socio-economic structures.

In those countries where the fertility rate is reported to be falling, overall population growth rates are relatively high; indicating that fertility rate is still high and in consequence the balancing of the demographic 'deficit' will take some time. Total fertility rates in Botswana, Zimbabwe and Kenya are around four children per woman. The fertility declines in these countries are still too recent to provide any basis for establishing an African pattern or determining the general duration of transition. The Tunisian case shows it is necessary to be cautious about assessing fertility transition in Africa. Though fertility has declined as a result of technological and economic change, the 'strength of the traditional cultural value of the family has prevented the realization of a completed fertility transition' (Stamm and Tsui 1986). The prevailing socio-economic structures still influence reproductive behaviour in many ways. Fertility is governed by many different factors and its decline in different societies may be started by a differing combination of factors. The types of demographic transition in sub-Saharan Africa in the twenty-first century or beyond are likely to be associated with different patterns of socio-economic development, about which we are still ignorant.

Theoretical frameworks and social science research.

The theoretical frameworks within which the policies and programs are conceived are woefully inappropriate. Most accounts of African societies written by social scientists are incomplete and inadequate to explain the nature of social change in Africa. Admittedly, the range of assumptions made about the cultural realities has been extended and, in some cases, modified, but little effort has been made to develop theories that clarify the roots of African social systems. Even studies supposed to be of theoretical interest tend to be out of touch with African realities. For example, the application of 'modernization' and 'dependency' theories to the African situation encounters a number of analytical problems. Both theories focus on a generalized linear model of socio-economic development which does not sufficiently incorporate the interaction between local and national forces. But the role played by local forces in the process of social change is very important to the development of theories that incorporate the fact that African social structures are complex entities comprising 'traditional' and 'modern' sectors.

Our inadequate understanding of the nature of the African societies as they are today shows the weakness of the existing theoretical frameworks. Similarly demographic transition theory is inadequate to explain social change and offer guidelines for monitoring and understanding future structural change in the African social systems. This then leads me to the relevance of social science research in the subcontinent. The neglect of anthropological and, to some extent, sociological research methodologies in the 1960s in favour of quantitative methodology gave rise to ill-founded optimism concerning demand for family planning services in Africa south of the Sahara. The data on which were based the reports recommending family planning programs to governments did not reflect the major and essential features of the social systems including different types of household arrangements,

and people's real attitudes and reproductive behaviour. Demographers and other social scientists have over the past few years realized the importance of combining quantitative and qualitative research methods to provide not only quantitative parameters but also explanation of the relationships between these parameters. The combined approach enables the researcher to understand not only the patterns but also the process of change; it yields accurate information on behaviour and a meaningful interpretation of what lies behind the behaviour. We know that there is strong correlation between education and fertility or between the education of the mother and infant and child mortality, but we do not have much information about the mechanisms through which education exercises such a profound influence.

Another example is the transition from poor to good health. We need to understand how the use of particular medical technology, such as prenatal care, affects health outcomes. This is critical in determining the efficiency and cost-effectiveness of possible interventions designed to improve health. We also have to analyse the reasons why people decide to use these interventions. Studying the determinants of behaviour is essential in evaluating the effectiveness of policies designed to get people to use the interventions effectively. Such an investigation takes us into the realm of social, cultural and behavioural determinants of health; beliefs and practices that account for illness and poor health as well as good health. The micro-approach is an effective instrument for explaining the links between variables, and for capturing the nature of socio-economic change. Furthermore, the approach enables us to explain the persistence of certain traditional structures and the emergence of new patterns of differentiations and social inequality. Many dimensions of pluralism together with cultural conservatism and resilience make African societies more complex and diverse than those in other parts of the world. This is why studies on Africa conducted on the basis of concepts and definitions derived from the study of other societies have not yielded useful results (Aryee 1994; Bledsoe 1994).

African universities and research institutions therefore have a major role to play in the collection and analysis of the needed data for assessing demographic trends and their entangled relationships with social and economic development. Unfortunately, an assessment of human resources development programs in Africa shows that training of future researchers is far from satisfactory. For instance, the United Nations Regional Institute for Population Studies (RIPS) which recruits students from about 20 member countries has produced only 28 M.Phil. and four Ph.D graduates during its 21 years of existence. The Francophone equivalent, IFORD, has no Ph.D program and the Cairo Demographic Training Centre which serves mainly North African countries has just started one. The situation is no better in the universities concentrating on undergraduate programs. For example, the University of Ghana, one of the oldest universities on the continent, produced 14 Ph.D and 31 M.Phil. graduates between 1986 and 1992 (Aryee 1994). Though research institutes such as the Institute of Statistical, Social and Economic Research (University of Ghana), Nigeria Institute of Social and Economic Research (University of Ibadan), and National Institute of Research (University of Botswana) have successfully undertaken a number of valuable research projects, their capacities for multidisciplinary social science research need to be improved. These research-oriented institutions do not seem to have had any significant effect on socio-economic development because of inadequate funding, weak institutional linkages and the absence of clear national policy guidelines. And as Aryee points out, one major handicap of these institutions is lack of

A comprehensive national policy or programme... imperative in directing attention to the most relevant issues, coordinating and monitoring research activities, and ensuring maximisation of scarce resources. It may also act as a central information management centre compiling directories or inventories of all on-going research and disseminating such information (Aryee 1994:48).

Lack of funding for research activities has constrained the development of social science in the region. The problem has been examined by Aryee:

The problem of inadequate funding can be ameliorated in part by strengthening and widening the range of institutional linkages between research institutions and the private sector, industry, non-governmental organizations etc. many of whom have a direct interest in applied research. There must also be more collaboration and coordination between the national research institutions themselves, many of whom tend to work in relative isolation or independence (Aryee 1994:55).

It is high time however, that the organizations interested in population and sustainable development issues and therefore funding population activities in Africa take local research much more seriously. Small research grants to local universities to conduct relevant and needed research on national demographic and socio-economic issues would enhance our knowledge about the demographic developments in sub-Saharan Africa.

Conclusion

This paper has stated that sub-Saharan Africa is not only an economically but also a demographically challenging region. At the theoretical level it is still struggling to develop appropriate paradigms; it is necessary to reorientate research strategies, redesign effective research instruments, and guide and streamline research activities by comprehensive national research policies. Strengthening human resource development programs and broadening the base of funding from both external and internal sources are also major issues.

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Doing ‘health’ research in an unhealthy research environment *



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If research produces knowledge about health, and knowledge is essential for improving health, then health research improves health, particularly through policy. Health transition research is exceptionally important to the production of useful knowledge (Caldwell 1990:xiii) because it deals with the causes of improved health over time.

While the logic is sound health research is not. It is a contentious field currently producing more confusion than enlightenment, in which continuing uncertainty means that it is difficult to identify and apply genuinely useful knowledge. Health research, including health transition research, is distributed over a number of fields which in themselves comprise separate academically-based disciplines and subdisciplines. These fields compete with one another to control research and funding; they do not work together to solve problems of pressing importance to health related human welfare. While there are exceptional individual social scientists, who conduct and support genuinely co-operative interdisciplinary research, their best efforts may not be able to transform a research environment which makes the production of useful knowledge difficult.

In the present research environment it is generally true that most health research is done to advance the welfare of a field and the experts in it. The competition between fields means that the overarching goal of all social science research — the improvement of human welfare — is easily lost in the struggle for disciplinary hegemony. The purpose of this paper is to explore the intellectual and institutional circumstances which create this counter-productive, welfare-negative research environment, and suggest how it might be reformed.

Producing knowledge by defining, measuring and explaining ‘health’ for policy purposes

All research in both the natural and social sciences begins with a set of fundamental concepts (McInnes, forthcoming). Concepts are the building blocks that make both measurement and analysis possible, thereby influencing interpretation, and the implications drawn from research for policy purposes.

* This is a revised version of a paper for the conference the Continuing Demographic Transition, The John Caldwell Seminar. Canberra, August 1995. Thanks are due to Pat Caldwell and Ken Warren for their comments on an earlier draft. A later version was given at the Social Science History Association meetings in Chicago, October 1995. Raymond McInnis chaired, and many useful comments were made by the session audience.

For example, we all know that the world's population has undergone a mortality transition. Individual life spans lasting seventy years or more used to be rare; now they have become the norm in developed countries. This useful knowledge is beyond contention because mortality trends are easy to measure. Mortality can be measured easily because it can be conceptualized and defined easily¹.

But when we ask if world health increased, decreased or was conserved as death rates declined over the last century, the first problem we confront is what the concept 'health' means.

Dead bodies share an end-state physiology, but those who think of themselves as healthy, describe themselves as such, or are called healthy by others, whether family members or professionals, have never been identical in any way (Das 1990). Health claims can be made about physiological or mental states, or forms of behaviour. A physically healthy individual may not behave like a mentally healthy person and vice versa. (Ahmed, Kolker and Coelho 1979:9). Persons afflicted with a fatal disease may nevertheless feel healthy; those classified as healthy may think of themselves as sick. In any event there has never been a neat biological basis for crisply dividing healthy and unhealthy individuals. Moreover as an adjective, 'healthy' can refer to individuals or populations, so that an unhealthy individual can be a member of a healthy population and vice versa. This complexity means that 'health' does not have an essential meaning; it is a naturally vague, multidimensional concept, which can only be given a specific meaning in a shared context which is likely to be impermanent. (Johansson 1993).

But until people can be classified as healthy, according to some standardized criterion, we cannot count or measure a healthy population, or generalize about health trends. This does not mean that individual experts cannot generalize about health or the health transition; obviously they do. It simply means that they make a wide range of conflicting and confusing generalizations, each of which has different policy implications. Some recent examples follow.

The author of a new book on emergent infectious diseases emphatically declared that the health transition was now an 'embarrassing myth'. He defined the health transition as a 'new state of physical well-being' based on the vaccine and drug-related conquest of common infectious agents (Horton 1995:26). Since diseases like HIV, the Ebola virus, and the Hantavirus have not been conquered, and several older diseases like TB and malaria have escaped effective control, it was logical to conclude that the health transition had come to a halt. By implication its resumption would depend on better methods of disease control, and hence on policies (including what research to fund) focused on biomedical methods.

Very different approaches to definition are possible. For example, Arthur Kleinman, Chair of the Department of Social Medicine at Harvard University, insisted that optimistic stories about a global transition to improved health (the health transition) should no longer be told, given the existence of over 100 armed conflicts in the world today, 40 million displaced people, and the baneful effects of development on the rural and urban poor (Kleinman 1995:13). Here Kleinman implicitly defines 'health' as something inseparable from political and economic security, which means that producing knowledge about political stability and economic development is more important than research on methods of disease control.

¹ Recent technological advances have made it possible to separate brain death from heart death. Once death becomes multidimensional (i.e. there are two kinds of death) disagreements naturally arise about which dimension matters more, and thus how specific cases, in which the two dimensions are not congruent, should be handled. Thus, the need for formal policies arise based on defining 'death' for social purposes.

John Caldwell invented the concept 'health transition'. As a demographer and anthropologist Caldwell has long promoted the idea that the diffusion of better health depends upon changes in the health-seeking behaviour exhibited in households or local communities. Behaviour patterns which prevent disease, or which assist recovery from it, exemplify the kind of progress built into the concept 'health transition' (Caldwell 1990:xiii). This is a cultural orientation to the health transition, because it emphasizes changes in learned behaviour encouraged by education. It shifts the focus of research to the micro-level, where millions of anonymous men and women make daily choices; and it confers a particular importance on the behaviour of women, who manage households and care for the sick. This definition of what the health transition means asks policy makers to pay more attention to education, particularly to women's education, than to biological research on new diseases, or to macro-level political stability, or to development research.

If new methods of disease control are thought of as driving the health transition, then ordinary people are perceived as passive beneficiaries whose welfare is served by scientists and public health workers. Similarly, if bad politicians disrupt the societal and economic foundations for health, then ordinary people are likely to be thought of as their victims. Clearly political and development research must come to their rescue, without having to focus on what just plain folk think or do.

In short the focus of health research and policy depends on how 'health' and 'health transition' are conceptualized. That is no doubt why David Reisman (1993:14) began *The Political Economy of Health Care* by aptly observing:

Equality in health is important. Sadly, it is also ambiguous: different people have in mind different things even when they employ the same words and phrases. If, therefore, the policy-maker is to take equality in health as an appropriate policy objective, he will clearly have to make it his business to decide what it is, precisely, that he is being sent forth to make more equal.

But precise definitions do more than simplify matters for puzzled but well intentioned policy makers², concepts, once defined, lead concerned officials down a particular mental path (funds in hand) towards the set of health experts who 'own' the field at the end of that path. Within any particular academic field shared concepts make the specialized production of knowledge possible, but concepts also function as mini-programs which covertly instruct researchers how to, and how not to produce knowledge. Definitions implicitly program research behaviour by drawing boundaries around a problem, and then covertly selecting what kinds of data (from the large set of all possible data) are relevant or irrelevant to it. Obviously the data-information identified as 'most relevant' will limit the choice of appropriate methods (qualitative or quantitative), and together, concepts, data and methods will constrain interpretation (Johansson 1990).

As E. A. Wrigley (1988:131) has argued: 'In relation to broad issues of interpretation, empirical evidence is seldom decisive'. In other words, facts do not speak for themselves, because they do not have a voice outside a conceptual context which let them speak. In different conceptual frameworks the same data become interpretable in a number of diverse ways, sometimes in opposite ways.

Methodology offers us no escape from conceptual determinism. Dr. Chitr Sitthi-Amorn (1991:433) of Chulalongkorn University, ended his review of an entire book on methods for

² Not all policy makers are well intentioned or dedicated to improving human welfare rather than their own personal welfare (Kunitz and Levy 1995). Human failings on the policy side compound the problem of applying useful knowledge to health improvement. But the focus in this article is on the role of academics in making the generation of useful knowledge difficult.

studying the health transition with the conclusion there was 'no point in debating the relative merits of different methods in isolation, apart from a discussion of the conceptual questions that need clarification'.³ And he is right. As long as empirical research on health must begin with concepts which are well defined and potentially measurable, 'health transition' history will never be settled by simple data-gathering, or the use of better methods (Johansson 1992:87-88).

Policy makers who want to sponsor field-neutral research, based on some universally suitable method for producing knowledge about health, do not usually have that option. All they can do is seek knowledge and advice from experts trained to produce knowledge in field-specific terms (Pahre 1995). Even the most cursory survey of modern academic research will remind us of how differently separate fields define 'health' and explain the course and cases of the 'health transition'.⁴

Demographers, for example, routinely equate the study of health with the study of mortality (Murray, Yang and Qiao 1992). Therefore the health transition equals the mortality transition. This mortality oriented approach implies that any individual who is alive possesses health to some degree, and therefore populations composed of relatively long-lived individuals are healthier than those whose members lived shorter lives.⁵ Since death rates are still going down according to recent data (World Bank 1993) then the health transition is continuing, despite new diseases, more wars, widespread poverty and an increasing refugee population. Fortunately for demographers their commitment to using mortality data to measure health has broad appeal across all modern cultures, but it implies that health policies must produce the postponement of death in order to be judged successful.

Epidemiologists do not agree that longer lives necessarily mean healthier lives. Older individuals have been exposed for longer periods of time to the risk of falling ill, and it is sickness not death which signals the loss of health. Therefore health policy should be about identifying and minimizing all forms of disease, not just those relatively severe forms which clearly shorten life. Health transition history should be about the discovery, reporting and management of every disease, not just those designated as causes of death. In short, health history is disease history.

The most famous event in modern disease history is the epidemiological transition, understood as the decline of infectious diseases and their replacement by chronic diseases as leading causes of death (Omran 1971). But one way to interpret the epidemiological transition is to assume that since one set of diseases (chronic) simply replaced another set (infectious) as leading causes of death, no 'real' gains in health were made as mortality fell. Health, in other words, is a historical constant that undergoes no transition over time even as disease patterns change.

³ In the series of three volumes on the health transition published by the Health Transition Centre only three short essays are devoted to issues of conceptualization. All of them are in the first volume, the authors being Etienne van de Walle, Alberto Palloni and John Cleland. Together these three essays total six pages. In contrast, an entire volume in the series (the third) was devoted to methodological issues.

⁴ See Pol and Thomas (1992), whose stated purpose is to allow academic and professional audiences to improve their demographic and epidemiological skills, which is perhaps why health is defined as 'the health status of the population', and health care as societies' arrangements for improving 'health status'. This deliberately vague approach to definition leaves room for any kind of specialist, but no particular conclusions.

⁵ But Stolnitz (1991:204-205) warns against using crude death rates for comparative purposes, because a population with a younger age structure can have a lower crude death rate than an older population with a higher life expectancy.

In general most health policy research has been dominated by biomedical approaches to defining health. These are based on the 'the great equation' which virtually defines 'health' as the delivery of modern medical care (Graubard 1994:vi). From this perspective the health transition can be conceptualized as the retreat of diverse forms of folk medicine and the global advance of medical care based on scientific knowledge.

When mental health professionals decided that their work was being undervalued by the biomedical tradition, they urged policy makers to adopt a broader definition of health. Ahmed, Kolker and Coelho (1979:xi) explained why 'health' should include various psychosocial dimensions, and therefore why specialists in mental disease should be admitted to the circle of medically certified professionals qualified to do socially relevant, funded, health research. Their point of view suggests that there may be a mental health transition which is related to but separate from a physical health transition.

Most social science definitions of health are usually critical of biomedical definitions, physical or mental, arguing that they focus too narrowly on the onset and treatment of symptoms in isolated individuals, and not the 'real' causes of disease. These 'real causes' are embedded in the social and economic environments which expose people to various risks, and thus cause disease and premature death. Thus, social scientists tend to treat education, peace, occupation, unemployment, development and even human rights as the real determinants of health, and, in an indirect way, the real cure for disease. Medical care, if considered important at all, is defined so broadly that it can be delivered by folk practitioners or women who manage illness at home, not just doctors. In this way the expertise of social scientists (which lies in the statistical analysis of large data sets often based on surveys) becomes as important or more important to 'health' research than medical expertise, a claim which provides the basis for seeking generous financial support from governments and foundations.

Among social scientists some health economists have divorced health research so completely from biology and medicine that they treat poverty as the only real cause of ill health.⁶ It is assumed that as individuals benefit from rising real incomes in the course of economic development, they will automatically invest more resources in their own health (or the health of their dependants) particularly through better nutrition (Frank and Mustard 1994). Income-based, nutrition-centred approaches to health and mortality history deny that delivering medical care to the afflicted has any value, even now (Hadley 1982).⁷ But when economic growth is perceived as driving the health transition, then health history becomes a sub-field of economic history, along with mortality history. Ironically, ordinary people do not become important decision-makers; instead their decisions are interpreted as a manifestation of some universal health-seeking rationality, rather than educationally mediated responses to information and its application in specific social contexts.

Economic perspectives on defining 'health' can be so all-encompassing that they fail to distinguish between investments in health *per se*, and all forms of investment in human capital or economic development. But they can also focus very narrowly on specific kinds of economic data which lend themselves well to standard methods of statistical analysis. If it is assumed, for example, that healthy people show up for work while unhealthy people do not, then time off work related to illness can be defined as a measure of health. Since the modern fall of mortality has been accompanied by rising numbers of adults who report themselves as too sick or disabled to work, it is possible to argue that declining mortality is increasing the proportion of unhealthy adults in developed populations. This fact can be interpreted as proof that health has an inverse relationship to mortality at the population level, because lower

⁶ For a survey of health economics see the 'sampler' collection of essays in *Daedalus* 1994.

⁷ Hadley explains the extent to which the attack on medicine depends on the use of certain statistical methods, and why those methods can be misleading.

mortality means that more frail (and sickly) adults survive for longer periods of time (Riley 1990). From this particular economic perspective, the modern health transition looks like a transition to poorer health. But this whole approach requires the 'expert' to assume that data about who shows up for work are a straightforward reflection of real biological failure.

Obviously, sociologists or anthropologists of health find such assumptions objectionable (Helman 1990). They regard 'health' and 'disease' as socially constructed concepts, which do not exist independently of people's culturally conditioned perceptions and learned behaviour patterns. Thus, the data on morbidity which we use to measure disease (as the absence of health) tell us more about how people have been trained to form health expectations, identify their symptoms as diseases, and interpret the implications of being sick in terms of aid-seeking behaviour. When ordinary people are given very high health expectations, as they have been in developed countries, and they know a lot about disease, as they do in these countries, benefits for being sick are generous, as they are in most high-income countries, and reporting systems are well developed, as they are in all the developed countries, then the amount of reported disease or disability can be expected to rise even as mortality declines (Johansson 1991).⁸

If we ask who is right (i.e. which definition is right and which set of experts are likely to produce knowledge for policy purposes) we are asking the wrong question. All of the definitions of 'health' and associated measurement strategies can make good sense in some context. Vague concepts like 'health' are vague because they stand for a set of related but distinct phenomena. Real world complexity makes the existence of an umbrella concept convenient for abstract purposes, but meaningless for most practical, policy-related purposes. When action is required, agreement on meaning is required, and what particular meaning is 'true' depends on what particular problems are being faced at a particular time in a particular context. For all practical purposes there are several, equally real health transitions.

As conditions change and perceptions change new contexts can give rise to new meanings for old concepts like 'health'. Most of the contributors to the influential volume of essays, *Reaching Health for All* (Rhode, Chatterjee and Morley 1993) are health reformers, who have worked in villages in developing countries. Their experience influences them to perceive health as a feeling produced at the community level by confident adults institutionally empowered to act on their own behalf. The general idea seems to be that progress can be anything which properly democratic local groups decide to call progress, because it enhances their sense of well-being. From this perspective the 'hard' data so highly valued by conventional social scientists seem irrelevant. If building a road fosters a greater sense of well-being than building a school or a clinic, then health policy must favour the road.⁹ After all, if people live longer lives, but feel worse about being alive, then who is to say that they are healthier? (Wildavsky 1977). In general, this radically subjective approach to health fits in well with modern tendencies to believe that health is a mental state, rather than 'mere' biological freedom from disease. However, it also puts the short-run interests of adults above the long-run interests of those who are less likely to have a voice in local affairs, for example women and children. Subjective health transitions always run into trouble because not everyone's perceived interests are alike, and the question remains: whose subjective sense

⁸ Generally as morbidity rises in the developing countries the commonly reported diseases become less severe (i.e. they are less and less associated with a high risk of dying in a limited period of time). Moreover fewer people reporting disease have two or more life threatening diseases at once. People can report more disease even as they become healthier because the diseases they report are not likely to cause death, and they rarely have more than one severe disease at a time.

⁹ *Reaching Health for All* is filled with compelling cartoons, a few flow diagrams, some data on nutrition, but almost no data on mortality or morbidity.

of well-being should determine the course of a local health transition, assuming such an elusive form of change could be tracked?

Historians as generalists do not have a professional stake in some particular definition of health, or some particular approach to health transition history. Potentially this leaves them open to all the complex and diverse dimensions of health, and how they change and interact with one another over time. Nevertheless since health history has so many potential dimensions — demographic, epidemiological, medical, bureaucratic, economic, cultural, psychological, political — a set of 'unbiased' historians is likely to produce a set of books with little in common. While interesting in themselves, idiosyncratic health histories would probably produce still more confusion about the causes of the health transition, and their implications for present policy.

Even so, historians are used to dealing with complex systems; they are tolerant of research that does not produce simple answers. But policy makers, who want guidance for choices that must be made now, are not. They want simple answers with clear implication, and, for the most part, social scientists are trained to provide those simple answers in field-specific terms.

Ordinary people, men, women or children, have no say on how research is produced, interpreted or applied to their welfare through policy. Conventionally trained social scientists (including social science historians) work for other professionals, who support their research in laboratories, institutes or far-flung locations. When those who fund the production of knowledge demand simple answers, they provide powerful incentives for knowledge producers to compete with one another by radically oversimplifying complex problems. This involves constructing 'proofs' or models that begin by assuming that one all-purpose definition of health will suffice to identify key variables and efficiently generate the right answers for all policy purposes.

Given that there is no real context-free meaning of 'health', and thus no key variables, or universally suitable method of analysis, the resulting competition between rival experts produces nothing more than endless disagreement and confusion. Bombarded by conflicting answers, policy makers can find themselves paralysed; or, if they act despite high levels of uncertainty, they can send health policy off in an unproductive direction which causes premature mortality (Caldwell and Caldwell 1995).

Those professionals involved in the movement to improve child health are acutely aware of this problem. Carol Worthman (1995:10) describes ethnopediatricians as believing that 'programmatic efforts to improve outcomes for children have been hampered by conceptual polarities and bureaucratic exigencies', so that children's needs with respect to health are 'balkanized among competing disciplines and agencies'. An abstract war between balkanized experts probably wastes real children's lives, even if their obscure deaths cannot be televised for the evening news.

Although intellectual diversity cannot be suppressed without destroying the freedom of thought and speech essential to any kind of research (Barnes 1991), we must ask ourselves if the form of unrestrained intellectual competition currently encouraged by the institutional structure of research is doing more harm than good to the health-related welfare of the living. Economists might argue that a free and highly competitive market in ideas has to be just as beneficial for health research as it is for the production and consumption of other goods. But there is no free market in ideas about health. Ideas, facts, methods and interpretations related to health policy are produced by field-specific experts according to standards set by their fields (or sub-fields). Field-specific experts are like the owners of a firm who reduce their own profits when they buy the 'products' (definitions, facts, methods) produced by rival firms. Within the field-as-firm, individuals who exhibit a preference for 'foreign' concepts, data or methods are thought of as disloyal or even incompetent by their colleagues. Those experts

whose tastes threaten their colleagues are unlikely to be admired or promoted. In the social sciences, the interests of individuals are so bound up with the interests of their fields that they are not free to shop around for the best ideas. They are under strong social pressure to protect their own welfare by advancing the interests of their field. Fields-as-firms would much prefer to monopolize research by driving their rivals out of business, not co-operating with them to produce a better product and share the profits. Competition to monopolize the production of knowledge stifles the free exchange of ideas and necessarily limits the amount of genuine interdisciplinary research done on health problems for policy purposes.

Entrenched institutions and interdisciplinary research

We need not imagine that social scientists who place the welfare of their field (and thus their own interests) above human welfare do so because they are cynical or unprincipled. Rivalries among social scientists who reduce all complex phenomena to field-specific terms are made, not born. Each specialist, whether demographer, epidemiologist, biologist, doctor, psychologist, economist, sociologist or anthropologist was trained to define health in field-friendly terms; they were not asked to consider the merits of alternative approaches. Even worse, training sometimes means making other fields seem ridiculous or irrelevant. When experts meet experts from rival disciplines they have all been conditioned to compete with or ignore as 'the enemy', interdisciplinary research does not get off the ground. Interdisciplinary conferences or research projects create doubt and anxiety which must be resolved. Within a field the expert who keeps the faith will be rewarded, and those who doubt (do interdisciplinary research) will not be trusted or admired unless they are very exceptional human beings.

When demographers insist that mortality data are always the best and most universal measure of health (Murray et al. 1992) they are proving that all health research must involve their expertise. The same is true for epidemiologists who attribute supreme importance to the morbidity data which demographers rarely look at. Health economists who make income levels into a universal measure of health are known to have been deliberately trying to undermine the importance widely attributed to medical care, thereby weakening the near-monopoly biomedical experts have had over health research (Hadley 1982). Naturally enough these natural-science experts fight back by resisting the invasion of social scientists into health research. Radical health reformers devalue most forms of natural or social science expertise, while elevating the importance of the political and anthropological skills they themselves happen to have.

Given the demand for simplification coming from policy makers, and the rivalry between academic fields, combined with the accommodating vagueness of the concept 'health', we cannot expect that assembling an interdisciplinary committee of famous experts is likely to produce a consensus which improves health-related human welfare. Since any simple, one-dimensional, definition of health would automatically advance the field-dependent interests of some experts at the expense of others, the most likely outcome will be a polite failure to agree on anything, combined with a determination to keep the interdisciplinary committee going as long as support is forthcoming.

When the Committee on Behavioural Health Research in Thailand set out to change health related behaviour, a suitable array of experts was assembled and charged with identifying those behaviours which were most important to health (Sittith-Amorn 1991:433). It should not surprise us that they could not agree on what these were. Although every individual on such a committee might be genuinely committed to improving their country's health, as experts they represent different fields, not ordinary people. Almost automatically their own particular academic perspective will select some behaviours to the status of 'most important' in a way which increases the importance of their expertise. In the real world, of

course, no form of human behaviour is irrelevant to health. Some scenario can be constructed in which any imaginable form of behaviour can cause disease or death in particular circumstances.

In the United States attempts were made to discover a set of universal health status indicators through well-funded research programs which lasted several decades. Numerous conceptual and technical barriers had to be faced, beginning with what constituted a definition of health. This barrier was never surmounted, and this ambitious research program gradually faded away (Pol and Thomas 1992:290).

Had any health status indicators been discovered this naturally would have given intellectual hegemony over research and policy to the set of experts most closely associated with those indicators. Once some form of expertise could lay claim to mattering most to health research, its intellectual stock would rise and the specialists in that particular field would collect psychic and material dividends in a number of forms, from feelings of self-importance to the lion's share of grant money available for research.

With so much at stake, the more experts from different disciplines who are appointed to an interdisciplinary committee the less likely it is to reach consensus. But without consensus the basis for action is weakened, unless widely shared moral sentiments come to the rescue (Preston 1987). For example, all highly educated experts are willing to affirm that education is a good thing. Thus when a committee of clinicians and sociologists agreed that more health education was needed to improve the health of the socially disadvantaged a start was made towards a program of action. But to sociologists the agreement on values meant that money should be diverted from acute services to educational programs. Doctors disagreed arguing that acute care was essential to preventing disease from becoming permanent disability. Since consensus would have involved shifting control over resources from one set of experts to another, no agreement could be reached.

In the present climate of research, where research is conducted by competing populations of experts, there is not much hope that health research, historical or contemporary, will drive health improvement in the real world. If it is doing so at present, its contributions are hard to identify (Caldwell and Caldwell 1995:254-255). At present all we can expect is a continuation of the situation, in which social scientists ignore or disparage the definitions, data and methods used by rival experts (Baron and Hannan 1994).¹⁰ In this research environment something approaching consensus can only emerge if one group of experts manages to intimidate, suppress or expel their academic rivals from the policy arena.

If we wish to consider alternatives to the present research environment, we have to think about changing the way experts are trained to be experts, as well as how they can be provided with new incentives for using their field-specific expertise co-operatively.

Explaining the whole elephant

We can begin by recalling the old parable about the blind men and the elephant. Each blind man grasps (specializes in) a part of the elephant, and can only deal with the whole elephant by reducing it to the part he knows best. The expert who knows only the trunk of the elephant

¹⁰ Economists and sociologists, for example, are both committed to understanding health related behaviour; but instead of co-operating to share insights they have erected formidable barriers to intellectual trade. James Baron and Michael Hannan discuss the rivalry between economists and sociologists at length, but they do so under the assumption that long-standing rivalry is an unfortunate historical accident which can be cleared away with enough reasonable discourse between the two groups. They describe the 'imperialistic posturing' (Baron and Hannan 1994:1140) of economists and sociologists as something which benefits neither group; I would argue that such posturing is adopted in pursuit of the group's interests and therefore promotes the welfare of each member.

declares that the elephant is a medium sized hollow tube and nothing more. The expert who specializes in the elephant's side, declares it is large and flat and only that. The expert who knows the elephant's tail, declares that the elephant is just another kind of snake. If all three experts were appointed to a committee on elephant policy they would find themselves debating how to define the elephant, and therefore which set of specialist assumptions should govern any particular welfare-related research project. Disagreement would continue as long as the research environment rewarded specialists for remaining blind to the whole elephant, even though you and I, as disinterested observers, can see that the elephant is a complex animal which cannot be reduced to any one of its distinctive parts, because it simultaneously possesses a hollow trunk, broad sides and a narrow tail.

Restoring sight to blind experts (who benefit personally from their inability to see the limits of their expertise) would only be possible by providing them with new incentives to see the value of combining their specialist knowledge. Such incentives would require the creation of new institutions designed to make co-operation scientifically respectable, normatively required and personally rewarding.

For the sake of good science future specialists would be required to begin their formal training by taking compulsory introductory courses in the whole elephant, where they would be taught that it was a structurally complex creature possessing a trunk, and a side *and* a tail, along with all its other characteristic structural features, both external and internal. Thinking of a complex creature in 'or' terms instead of 'and' terms would be discouraged. Moreover elephant populations would be presented as an outcome of a number of genetic, environmental and demographic processes which created them as a distinct species. This elephant history would naturally raise fundamental conceptual questions like deciding when the ancestors of living elephants made the transition to being modern elephants. Most importantly, understanding the elephant in order to protect its welfare would require experts sensitized to the ethical implications of one species managing the future of another.

Once experts were trained to see elephants in all their complexity, they would subsequently train as specialists. Like all complex creatures the elephant is too complicated for any one person to know everything about it. Protecting elephant welfare requires specialists who have a detailed understanding of its particular parts and processes. But making elephant policy would be perceived as requiring co-operation between teams of individuals with specialist knowledge. Co-operative specialists would expect to deal with a wide range of welfare-related problems by combining their expertise, according to the logic of some particular problem. Sometimes one kind of expertise would be more important than another. But the ethics of doing co-operative research would require that no type of specialist knowledge would ever be disparaged, and respect for a wide range of data and methods, quantitative and qualitative, would be actively promoted as an essential precondition for fruitful co-operation designed to promote the welfare of elephants.

Translated to the world of modern social science 'whole elephant' research would mean conceptualizing human social systems as complex systems, which cannot be reduced to the study of one particular part, or subsystem (Johansson 1995). Shifting the orientation of social science research from its long-established fixation on simplifying complex systems is a formidable task. But consider once again how counter-productive present institutional arrangements have become, especially with respect to health.

Imagine that doctors were encouraged to believe that the best way to cure the sick was to divide up the human body into its major organ systems, train doctors to understand only one organ system, and make their success depend upon persuading potential patients that only one kind of organ failure caused disease, and required medical attention. Heart specialists would be rewarded, not punished, and admired, not admonished, for 'proving' that they could cure diseases by performing surgery. Rival specialists in the lungs, the brain, the immune system,

the kidneys or gastro-intestinal system would naturally fight back by disparaging the inflated claims of heart surgeons. But, in a rivalrous climate of research, they would be tempted to go further by insisting that only their own particular form of expertise could cure most disease. To the extent that any set of narrowly trained medical specialists succeeded in monopolizing research, care or health policy, they would kill many more patients than they cured, and be rewarded for doing so.

That is why modern doctors are trained to understand that the human body is a set of interrelated, equally important subsystems, which remain sufficiently different from each other to warrant specialization, but not to justify essentialism or reductionism. Ideally medical specialization takes place in an institutional context which stresses overarching co-operation between specialists. Among other things that means that heart surgeons would never claim that only heart surgeons were real doctors, or that all diseases could be cured by the latest forms of heart surgery. But in the social sciences as they are currently organized rival experts routinely make equivalent claims for their field, stressing the necessity of either-or choices and disparaging co-operation between specialties (Warren 1988:895).

Health history and health policy

If we try to apply the above lessons to health research, it is obvious that the concept 'health' refers to a set of related but distinct phenomena which has no simple core to which all the complementary dimensions of health can be reduced. Thus the promotion of health-related human welfare through research requires co-operation between experts who study the various, equally legitimate aspects of health. By implication the history of the health transition is not one-dimensional. It is multidimensional. Health history must be approached as a complex set of changes over time, some of which may increase, decrease or stay the same as mortality declines. Getting these multiple stories straight, and translated into some kind of quantifiable form, would require genuine co-operation between a team of experts. By extension the researchers would have to be rewarded, not punished, for being co-operative, and open to other perspectives.

Short of far-reaching institutional reforms, only small steps towards a better future can be taken by conscientious individual researchers who find competitive research ethically bankrupt and empirically unsound. One step surely involves giving up naive positivist assumptions about the purely biological nature of health, without going to the other extreme and assuming that health is entirely in the mind, or in the language used to discuss it. As individuals, our universal fate is to sicken and die, but while we live, our health clearly depends heavily on how we are trained to think about the signs and symptoms of disease in a social context. Thinking about health as a socially constructed concept is not an escape from biology; it simply encourages us to accept that people have always interpreted real biological states in cultural terms, which adapt to knowledge of limitations, value systems and the economic limits imposed by available resources (Lock 1995).

Approached from a sufficiently interdisciplinary standpoint, health history could be one of the best forms of preparation for specialist study, especially if it is policy-oriented. History matters to health research because all we can really hope to know about how complex systems can be changed is to observe how they were changed (or not) in the past. Policy-oriented health history would begin by identifying how health problems have been conceptually framed in different times and places, and how reformers fit concepts, data and methods to the needs of that particular problem, or, alternatively, how one particular set of specialists, 'the winners', made the perceived health problem fit their particular research agenda.

In any event, good, useful, multidisciplinary research requires giving up the idea that there is one real definition of health, one type of data that is always most relevant to it, and one set of methods that are always sufficient for understanding it. It may even require giving

up the idea that experts and only experts should have full control over research. Although radical health reformers have become too negative about the value of expert knowledge for my taste, they are surely right to stress the inclusion of ordinary people in the social negotiation of human biology for purposes related to their perceived health and welfare.

Good health history would encourage specialists to develop a flexible cast of mind, which would weaken disciplinary narrowness, and promote a multidisciplinary approach to policy. Thus, if one of the newly emergent diseases suddenly threatened death on a large scale, it would be easier to build a consensus that the biomedical approach was the natural first line of defence. Cultural approaches to health would be temporarily marginalized, unless they could prove that they were directly relevant to containing the spread of a specific disease. This is more or less what has happened with AIDS research.

If the newly emergent diseases remain localized threats, and death rates continue to decline while health care costs continue to rise, the economics of health will naturally come to the fore, as it already has done for several decades. Every specialist must consider what health economists have to say about costs, and why so many believe that some form of rationing is inescapable.

But suppose the problem of concern is differential death rates between groups who live in the same disease environment, and seem to have equal access to the same medical resources. In this case cultural experts, who study how beliefs, values and norms can influence the prevention of disease or the treatment of illness, must come to the fore in the policy process (Helman 1990).

Agreeing that health research must be governed by the logic of complexity is not the same as agreeing that health research is very complex. Health policy experts have traditionally called health research complex (Wilensky et al. 1989:48); but, having done so, they proceeded to deal with problems by simplifying them to suit the needs of their employers. When research is done for cost-cutting governments, better health gets defined as making services and delivery systems more cost-efficient without regard to other aspects of welfare (Pol and Thomas 1992). In short, invoking complexity as an excuse for continuing oversimplification does not count.

In the imperfect present all health professionals must make an ethical decision whether or not to continue defining health in narrowly specialist terms (as they were trained to do) and thus ignoring work done outside their field, or disparaging alternative forms of research (as they often do). Given the present structure of health research, which makes it difficult for individual researchers to look after their own welfare and human welfare simultaneously, specialists need to be encouraged to develop an ethical consciousness about the possible impact of their research, and to ask themselves if oversimplified, overspecialized health research is as good for ordinary people as it is for themselves.

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Demographic life transitions: an alternative theoretical paradigm



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Abstract

Event history analyses, while useful, have limited explanatory power in relation to demographic life transitions. This is because demographic behaviour has a future orientation. People marry, cohabit, have children, divorce or migrate primarily because they have expectations or hopes about how these transitions will affect their lives. Individuals weigh up alternatives about their future within their personal and cultural context. The paper proposes and develops a holistic approach to the investigation of demographic life transitions which revolves around three dimensions: the self, the intimate and the social. Event histories were spawned by the life history approach. The paper argues that we need to get back to examining the histories of lives, that is, how events fit into lives, rather than abstracting events from lives.

A standard approach to research of demographic life transitions in the West has been to conduct surveys of individuals (often, women only) spread over a wide age-range (40 years or so) using event histories in which the timing of life transitions is precisely measured. In addition, a series of conventional characteristics of the respondent are obtained such as education, occupation, religion, religious practice, ethnicity, urban/rural background together with similar characteristics relating to the respondent's parents. Results are then analysed using statistical techniques to examine whether the timing of life transitions is related to any of the measured respondent characteristics.

While the event approach provides important insights, it is limited because it excludes the theoretically most important determinants of demographic behaviour. The main point I wish to make is that demographic behaviour has a *future* orientation. People marry, cohabit, have children, divorce or migrate primarily because they have expectations or hopes about how the particular demographic change will affect their lives. Among all types of life events, these demographic events, especially forming and dissolving couple relationships and having children, are near the top of the list of the amount of social adjustment associated with them (Holmes and Rahe 1967). They are central events in our lives. The event history approach is limited because it relies upon time-dependent variables which *pre-date* the change in demographic status and can be precisely measured in a retrospective way.

For example, Santow and Bracher (1994), applying an event history approach, are critical of Cherlin (1980) and Oppenheimer (1988) because these researchers refer to the employment of women *after* marriage as an important factor in marriage timing. Opposing this theoretical viewpoint, Santow and Bracher (1994:490) refer to 'the logical difficulties of incorporating post-marital employment into a model of marriage'. By this approach, individuals are not able to have a future orientation. We are not seen as thinking individuals who weigh up alternatives about our future within our personal and cultural context. Instead, we are considered to be fully determined by census-type characteristics which derive from our past.

Event history approaches tend to eschew psychological explanatory factors such as values, personality, expectations or aspirations because, with some justification, retrospective

measurement of these types of variables is considered to be too unreliable for the standards of precision required for statistical modelling. Yet it is frequently the case that users of event histories interpret observed statistical relationships between demographic behaviour and a measured individual characteristic in terms of these unmeasured variables. For example, in their study of marriage patterns in Australia, Santow and Bracher (1994) conclude:

children from small families acted in a particular way not because they came from small families per se, but because their small family reflected their parents' values,

children whose fathers were highly religious acted in a particular way because the fathers' values were transmitted across the generation,

association of particular behaviour with increasing age reflects increasing maturity, independence or social norms,

those who migrated as young adults behaved differently because they had demonstrated independence from their parents,

a major force in increasing marital instability in western countries may have been an increasing emphasis on the rights of individuals to seek personal satisfaction, and

demographic changes may not be as significant to the participants as they are to the observers.

Results of event histories are reported in this way because it is obvious to the researcher that there is indeed a deeper meaning to observed relationships between life decisions and socio-demographic characteristics. Despite the 'statistically softer' nature of the research, if the researcher is to draw conclusions which extend beyond the statistical observations, some form of direct investigation of those deeper meanings should be pursued.

An advantage of the event history approach is that it pays close attention to measurement of the timing of change. As a consequence, the method often produces the result that historical time has a large bearing on particular demographic behaviour. In many instances, however, the researcher is unable to elaborate upon this finding because of failure to address the time-specific social milieu. That is, users of event histories tend to remove people from the social setting in which they made their decision. Santow and Bracher (1994), for example, argue in relation to research of marriage decisions that 'far too much weight seems to have been given to aggregate-level relationships', that is, to the social setting in which the decision took place. People's expectations of their life subsequent to marrying or having a child or divorcing are crucial to these decisions and individual expectations are strongly conditioned by the social situation in which people live. In this sense, the perceived employment circumstances of married women or women with children are obviously crucial to the respective decisions of marrying or having children.

The field of demography will only make advances in explanatory power by addressing theory first and method second. That this is not a view universally held is indicated by the following:

It seems to us that important gains accrue from a careful analysis of such (event history) data, motivated by a desire to describe and understand the complexities of the data, and undertaken from a consciously atheoretical approach (Santow and Bracher 1994:490).

A spheres-of-life framework for investigating demographic behaviour

The Level of Living surveys conducted in Scandinavian countries take a whole-of-life approach to the measurement of living standards. People's lives are divided into particular spheres of activity and measures are obtained of their living standard within each sphere

(Erikson and Uusitalo 1987). Understanding and meaning are obtained by seeking a broad range of information. Important interrelationships between different spheres of people's lives are able to be investigated.

Likewise, in economics, radical institutionalists argue that the focus of economic inquiry should be on the processes by which societies provision and reproduce themselves and that economic systems are human creations continually subject to change and amenable to reform (Peterson 1994). Within this framework, individual choice cannot be considered in the abstract (the rational man maximizing his utility), but always within the cultural context in which the decision is made. Besides conventional economic resources, factors such as power, status, politics and networks are relevant to individual economic decision making. Again, the approach is holistic rather than atomistic.

Decisions about marrying, having children or divorcing are at the centre of people's lives. Because the decision made has substantial bearing upon most aspects of life, decisions are taken in a whole-of-life context. Thus, a holistic or spheres-of-life framework is at least equally appropriate to the study of demographic life transitions.

At the broadest level and from the perspective of demographic life transitions, the spheres of a person's life can be defined as: the self; the intimate; and the social. Each of these aspects of the person interacts with his or her social environment to provide the context in which decisions are made.

This holistic paradigm mirrors the dialectical paradigm used in the psychological study of adult development (Riegel 1975) and the symbolic interactionism paradigm of sociology. Symbolic interactionism derives from the work of Mead (1934) who perceived human behaviour as ensuing from the linkages between mind, self and society. Symbolic interactionism holds that realities are constructed through social interaction and that behaviour occurs in a situational context. The adult development literature also emphasizes the importance of the social context (Brandtstadter 1990). The dialectical paradigm (Riegel 1975) emphasizes the role of conflict in development and Erik Erikson's notion that interactions between the individual and society are both inevitable and vital.

The intimate is separately identified in the paradigm proposed here because it is postulated as being central to theories about marrying, having children or divorcing. This follows Erikson (for example, Erikson 1980) who established intimacy as an integral component of adult development. The intent here, however, is not to specify a paradigm for the study of all of adult development, but for the study of demographic life transitions.

The nearest approximation in the literature to the approach proposed here is Levinson's (1980) 'evolution of the individual life structure':

The life structure is the pattern or design of a person's life Its primary components are one's relationships: with self, other persons, groups, and institutions, with all aspects of the external world that have significance in one's life (p. 278).

The life structure as a whole, and every component in it, has both external and internal aspects. The external aspects have to do with the persons, social systems, and other outside realities with which the person is involved. The internal aspects are values, desires, conflicts, skills — multiple parts of the self that are lived out in one's relationships. Our analysis must begin with the overall life structure. Once that has been characterised, we can examine in more detail the ways in which its components operate (p. 278).

Levinson found in his own study of men that components of the life structure can be central or peripheral, and that the importance of components can change over time. However, the components of work and family were usually the central components although their relative weights varied from person to person. Levinson also found that the life structure evolves through a 'relatively orderly sequence' of periods during the adult life years:

The sequence consists of an alternating series of structure building and structure-changing (transitions) periods. a person must make certain key choices, form a structure around them, and pursue his values and goals within it.The primary tasks of every transition period are to reappraise the existing structure, to explore the various possibilities for change in self and world (p. 280).

Obviously, demographic life transitions are among the most important of all structure-changing periods. It must be kept in mind, however, that the process of transition may not be as orderly or logical as the Levinson quotations suggest. Decisions may be almost entirely conditioned by social norms (I didn't think about it; that was just the way things were done in those days) or they may not be clear cut (I had lots of doubts, but in the end decided to give it a try).

Elaboration: the sphere of self

The sphere of self can be divided into three components: the inner self or mind; the conditioned or experiential self; and personal attributes or skills. The inner self refers to psychological dimensions such as personality, temperament and adjustment. With origins primarily in biology or experiences of childhood, the inner self, while not immutable, tends to be resilient to change (Plomin and Thompson 1988). There is a range of measures of aspects of the inner self available in the literature and more use could be made of these measures in studies of the main demographic decisions.

The conditioned or experiential self is the sum of our values, attitudes, beliefs and expectations about the world and our place in it. It is the meanings we have gathered through our previous experience of people and the world. These change with experience and as the situation in which we live changes (Stevens-Long and Commons 1992). As argued above, because the important demographic decisions have a future orientation, the conditioned self is the core component of these decisions. Again, there are numerous measures available in the literature of aspects of the conditioned self. The selection of which measures are employed in a particular investigation depends upon the theory or theories to be tested.

Measures of the inner and outer self are necessarily current and are therefore better applied in the study of current or impending behaviour. Nevertheless, the association between aspects of self (measured currently) and past behaviour is worthy of investigation if the alternative is to ignore this sphere of life entirely. Furthermore, especially in respect of the conditioned self, it is possible to have people reflect upon how their values, attitudes, beliefs and expectations have changed and how any changes may have affected their family behaviour. More directly, when we are dealing with some of the most important decisions in people's lives, while there may be elements of *post-hoc* rationalization, it is not unreasonable to have them describe their current image of their conditioned self at the time they were making the decision. Finally, longitudinal surveys allow the measurement of aspects of the self at different points in time and to relate these measurements to behaviour between the interviews.

Personal attributes and skills consist largely of the standard set of 'background' variables used in event history analyses (education, occupation, ethnicity, race, work experience, religion, urban/rural background, etc.). In the context of the paradigm, these variables can be seen as summary measures of past interactions between self and world.

The sphere of intimacy

From within the sphere of self, almost all of us have a strong need for companionship and intimacy. Being needed, loved or valued by intimate others and especially, another, is

fundamental to our self concept. It is to fulfil this need that we form intimate relationships with others. An intimate relationship is one in which we are prepared to reveal our self-perceptions, worries and anxieties, in the understanding that the intimate other will be supportive rather than destructive in the use of this personal information. Intimate relationships also often provide us with core linkages to the broader society. Most prominently, being 'coupled' has a distinct meaning and bearing upon our interactions with the wider society. The type and nature of intimate relationships that we form and how we form them are specific to the culture or social organization in which we live.

Intimate relationships can be divided into three broad types: the couple relationship, intra-familial relationships (parent-child, sibling-sibling), and intimacy with friends. In Western culture, women are usually considered to obtain a higher level of intimacy than men from the second and third of these types. This does not mean that women have less of a need for relationships of the first type, but it does mean that they have more support outside the couple relationship. Being empty has much more meaning to the vessel of intimacy than being full, suggesting the use of measures which indicate low levels of intimacy in a person's relationships.

The couple relationship, whether it be opposite-sex or same-sex, is of central importance to the major demographic decisions. This implies careful investigation of the nature of the relationship and how the relationship interacts with other aspects of people's lives. The extent to which couples make free choices about the nature of their relationship as distinct from the relationship being socially structured is an important factor. Of particular interest is the extent to which the partners operate autonomously or in an enmeshed or dependent way. Measures that might be considered would be degrees of attachment, commitment, dependency and self-disclosure. A theoretical proposition is that today's couples are seeking to be less dependent upon each other financially but more dependent upon each other emotionally if compared to the Parsonian ideal of the 1950s couple: husband as breadwinner, wife as homemaker, living in mainly separate worlds.

It has been observed that today there is a less-structured and more 'do-it-yourself' approach to relationship construction (Glezer 1993). The nature of the construction is certain to have a major bearing upon whether the relationship is constructed in the first place, whether it involves children and whether it lasts. Oppenheimer (1988) argues that the difficulty of negotiating a new relationship in a less gender-segregated society has contributed to the decline in marriage rates. Furthermore, the rise of forms of relationships other than legal marriage has been attributed to a greater emphasis upon individual autonomy within a couple relationship (Wiersma 1983; McDonald 1988; Lesthaeghe and Moors 1993; Glezer 1993; Carmichael 1995).

The social sphere

The social sphere involves levels and forms of interaction with the rest of the world. Important to all people and to their demographic decision making is the interaction with the economy and, more specifically, the labour market. Other potentially important social interactions may be with the extended family, the neighbourhood or community, the government and its services, political and social organizations or clubs, the media, and religious organizations.

Following Levinson, we should be attempting to evaluate the importance of different social interactions in the way that people define their lives. Most particularly, we should be measuring the centrality of paid employment to people's social world. To what extent is fulfilment obtained through work or through other means? Paid employment can meet many needs: income, autonomy, a sense of worth, fulfilment of expectations, social acceptance, security, social integration and social networks. How important is it in fact in meeting these

needs in individual cases and how is the level of involvement in work related to the demographic decisions that individuals make? In this regard, successful use has been made of work-family values scales (Glezer 1993).

Involvement with the labour market has been largely compulsory for men and is taking on more of a compulsory nature with each successive generation of women. Involvement with the extended family also carries a heavy degree of social obligation and can be demanding, but in most cases, this involvement is not demanding and, indeed, is often supportive (McDonald 1995a). Involvement with other social institutions, however, is more voluntary in nature. Despite this, for some people, the important social interactions in their lives are with institutions other than the labour market, for example, with a religious organization or with an 'interest' organization (politics, sports, arts or crafts, neighbourhood, schools, social services or welfare). What do we know about people who define their lives in terms of these largely voluntary interactions? What implications does involvement outside of work and family have for demographic decision making? A conventional view is that as involvement with the labour market becomes more concentrated, involvement with other, more voluntary social institutions reduces. This, in turn, may narrow social networks to those that are work-based.

Another dimension worthy of consideration within the social sphere is what might be called an 'anti-social' orientation. This is marked by absorption in the self or the intimate spheres. Activities are individualistic or inclusive only of intimates.

Theoretical considerations

The aim of the paradigm is to provide a framework for the formulation of theories about demographic life transitions and for the specification of means of testing those theories.

The most important change in women's lives in the past 30 years has been the increasing importance of paid employment, especially in the lives of women who have children, still a substantial majority of all women. The most important change in men's lives has been the change in women's lives. While they may be out of the labour market from time to time, mothers today are rarely out of the labour force for the entire time that their children are growing up. Within the Australian family context, the mother's role in the labour force still remains largely secondary to that of the father, often by preference (McDonald 1995b; Wolcott and Glezer 1995), but the balance is changing with each successive generation. Now, in Australia, there is almost no difference between the ordinary-time wages of women and men employed full-time, if we omit those who are managers (ABS 1995). Men currently maintain their advantage in the labour market primarily through working more hours. They are less likely than women to drop out of the labour force or spend time at home for the care of young children; they are more likely to work hours of overtime at lower occupation levels and more likely to work hours of unpaid labour at the managerial level. The Australian Living Standards Study has shown that, under present role-sharing arrangements, full-time work puts mothers under more pressure than other workers. Thus, men and women without children continue to maintain the labour-market advantage of being able to work more hours (Wolcott and Glezer 1995).

A theoretical proposition that I have made before (McDonald 1988, 1995b) is that most people experience conflict of the three spheres of life: their social sphere (particularly work), their sphere of self (personal autonomy) and their intimate sphere (couple relationships and children). The need to resolve the conflict between individuation (autonomy) and fusion (intimacy) was the subject of the presidential address to the American Psychological Association by Janet Spence in 1985 (reported in Stevens-Long and Commons 1992). These conflicts are acute in the transition periods of the life structure such as forming and ending couple relationships and having children. The changes in women's and men's lives over the past 30 years have accentuated the degree of conflict.

The societal solution to this increased conflict has been to allow people greater flexibility in the ways they arrange their relationships and to provide new supports in combining work and family responsibilities. The growth of cohabiting unions, divorce, later marriage, later child-bearing and having children outside of marriage can all be seen as social experiments that the society has been prepared to tolerate as people seek their own solutions to these conflicts. Rather than being driven by conformity, behaviour becomes ethical, driven by personal principles (Stevens-Long and Commons 1992:85). This shift to ethics provides an understanding of why it is that some experiments have been cut off at onset. For example, so-called 'open relationships' where coupled individuals openly have sexual relationships with others have not been tolerated. They are unethical in a context where the quality of the intimate relationship is highly valued.

Thus, forming or ending relationships or having children are not events that occur in a moment of time as implied by the event history approach. Rather, in Levinson's terms, they are constructed during a transition period. The decision to form a relationship is not independent of the nature of the relationship being formed. The decision to have a child is not independent of the effects upon the spheres of life that ensue from the decision. A decision to end a relationship is taken in consideration of the gains and losses that the decision can be expected to bring.

Event histories were spawned by the broader, life history approach. It is proposed here that we need to get back to examining the histories of lives; that is, how the events fit into the history of the life. Life histories collected on a larger scale offer the opportunity to relate changes in demographic behaviour to temporal social change, to social aggregates.

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Rationalizing health care in a changing world: the need to know



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Abstract

The World Development Report 1993 announced that global life expectancy was then 65. Experience in the developed world suggests that the World Health Organization's dictum, 'health is a state of complete physical, mental and social well-being', is simply not attainable for the foreseeable future. As physical health has improved, mental problems have become more prominent and a sense of well-being has declined. Furthermore, as the population ages and medical technology improves, the cost of health care grows almost exponentially. Since the population of the developed world is continuing to age and aging is spreading rapidly throughout the developing world, knowledge is the principal way of dealing with this seemingly intractable problem: we must know, quantitatively, the age-specific causes of ill health, and we must know which means of prevention and treatment are effective. Finally, we must apply that knowledge rationally

The first childhood of humankind essentially began when primates descended from the trees millions of years ago; it lasted until about the end of the nineteenth century when life expectancy began to rise in the Western world. It began to accelerate only about 50 years ago and touched the developing world only in the last 30 years. Richard Peto found that half the population was dead before the age of 40 in the pre-agricultural Palaeolithic and agricultural Neolithic periods, in a Roman colony in North Africa, in old rural Britain (pre-industrial revolution) and in tropical Africa only a short time ago (R. Peto, personal communication). A Rockefeller Foundation meeting in 1985 called *Good Health at Low Cost* made us aware that three of the poorest areas in the world, China, Sri Lanka, and India's Kerala State, had verifiable life expectancies of 65 (Halstead, Walsh and Warren 1985). In 1988 at a conference in Bellagio, Caldwell gave this ubiquitous aging process both a name, the 'health transition', and a formula encompassing the demographic transition with its decrease in infectious disease mortality and decline in fertility, and the epidemiological transition with its aging population and increase in chronic non-communicable diseases.

In 1993 the *World Development Report: Investing in Health* trumpeted the startling statistic that global life expectancy had achieved 65: China's had leapt to 69, Sri Lanka's to 71 and the composite figure for all of Latin America and the Caribbean had reached 70. In China the communicable, non-communicable and injury related deaths were respectively 13, 77 and 10 per cent, and in India 35, 57 and 8 per cent. In the last 50 years humankind in the aggregate has undergone a startling transition from a child-based to an aging population rapidly moving towards its second childhood.

These massive transformations, due to a combination of social, political, economic and medical changes, have resulted in a population explosion which, in turn, is having major environmental effects. Moreover, the economies of the developed world of the North are

being threatened by the high cost of health care delivery, while those of the developing world of the South cannot even begin to afford the profligate health care systems and technologies adopted by the governments of the North. Paradoxically, the World Health Organization's famous dictum that 'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity', is proving to be a more and more tenuous goal. As physical well-being has increased in Europe and North America, mental illness has become more prominent. In fact 'mental illness and handicap' was the most prevalent condition, based on morbidity indicators as well as mortality rates, in Black and Pole's (1975) pioneering study of the relative burden of disease in the United Kingdom. As social well-being has improved, both within and among nations, the disparity between wealth and poverty has become more pronounced. For instance, life expectancy at birth in the poverty-stricken areas of many inner cities in the United States is comparable to that of parts of Africa (McCord and Freeman 1990). Finally, as people live longer and healthier lives they become more disgruntled with medicine and health care, as described

Although the collective health of the nation [USA] has improved dramatically in the past 30 years, surveys reveal declining satisfaction with personal health during the same period. Increasingly, respondents report greater numbers of disturbing somatic symptoms, more disability, and more feelings of general illness (Barsky 1988).

A key necessity in dealing with these complex matters is the gathering of valid data on factors as crucial as the age-specific prevalence of the diseases occurring in the areas of concern, and the relative efficacy of the interventions used to diagnose, treat and prevent them. Strategies for maintaining health and ameliorating disease must be based on knowledge; 'need to know' is an essential part of the process. During this century many conflicting health concepts and strategies have been advocated. These were often based on erroneous scientific, epidemiologic, demographic or economic data. Moreover, many national, regional and even global projects were launched on the basis of these ideas, but, for the most part, their outcomes were disappointing.

Concepts and crusades

From the beginning of the twentieth century there have been conflicting concepts on the diseases responsible for morbidity and mortality, their relative quantity and importance, and how to treat and prevent them. Withal there has been a constantly changing playing field as the disease spectrum has altered with socio-economic development. This began before the turn of the century in Europe and the United States. Only in the last few decades has it spread, at an unprecedentedly rapid rate, throughout the rest of the world. The fundamental change has been from high infant and child mortality rates due largely to infectious agents, to the chronic diseases of aging.

Over this span of more than 100 years there has been enormous controversy about what was going on, and on how to deal with those problems deemed to be of importance. During this age of metamorphosis academicians and bureaucrats were either unaware of it, ignored it, or vied with each other over the causes or the means of coping with it. As is usual in such situations, those involved were virtually all limited by their own professional points of view: biomedical, public health, agricultural, political, demographic, economic, sociological, even religious. The fundamental reality, however, was that almost all of them were right to a certain degree, but, unfortunately, most of them believed that their particular concept was the predominant or only one.

At the beginning of the twentieth century, when the colonial powers were concerned with the high mortality of their soldiers and administrators in the tropics, a major controversy erupted over whether the answer to the high death rate in young and healthy individuals lay in

biomedical research or public health application (Warren 1990). In 1898, Manson, the 'father of tropical medicine', stated:

I now firmly believe in the possibility of tropical colonization by the white races. Heat and moisture are not in themselves the direct causes of any important tropical disease. The direct causes of 99% of these diseases are germs. To kill them is simply a matter of knowledge (Manson 1898).

His student, discoverer of the means of transmission of malaria, and great adversary, Ross believed passionately that the main determinants of health were 'general living conditions, diet and sanitation.' Three decades later Ross conceded the battle:

I must say that I was rather disappointed with Manson's attitude towards the whole subject of prevention. He never seemed very keen on it and was chiefly interested in the parasitological side of the subject while I was interested more in the practical side ... The British Empire has generally followed his example during the last thirty years (Ross 1928).

At that time, the 1920s, the Rockefeller Foundation had begun its crusade to eradicate hookworm by a combination of chemotherapy, sanitation and education in '52 countries, 6 continents and 29 islands of the seas'. This was soon followed by a campaign led by Gorgas to eradicate yellow fever from its reservoirs in Latin America and Africa by mosquito control. But the greatest battle of them all was the World Health Organization's campaign from 1955 to 1970 to end transmission by a campaign in a short space of time that would eliminate the 'reservoir' of infected cases. Unfortunately, none of these magnificent initiatives achieved their ultimate goal, leading to general disillusionment with targeted campaigns driven by science and technology.

Thus, it was not surprising when Professor of Social Medicine, McKeown (1976), proclaimed, on the basis of his studies of changes in mortality in England and Wales from 1838 to 1970 that 'Medical measures of immunization and treatment were relatively ineffective; they were also unnecessary' (McKeown 1976). This point of view was reinforced by a working paper commissioned by the Rockefeller Foundation for a conference on Health and Population in Development (Grosse 1980). Using data gathered in Indonesia, this document reported multiple regression comparisons of life expectancy and infant mortality rates with a multiplicity of health, economic and social indicators. Its primary conclusion was that 'health inputs and sanitation facilities were less able to explain variations in levels of life expectancy than were social factors' (Grosse 1980), one being the availability of transistor radios.

Grosse's use of monolithic figures such as life expectancy in his working paper led to concern that, being composites of numerous diseases and other health-related factors, they do not permit a clear grasp of the issues or enable the development of specific strategies to control them. This concern resulted in another paper that, for the first time, tried to elucidate the specific killers of infants and children in the developing world. It revealed that the major causes of mortality were diarrhoeas (5-10 million per annum), respiratory infections (4-5), malaria (1.2), and measles (0.9) followed by schistosomiasis, whooping cough, tuberculosis, neonatal tetanus, diphtheria and hookworm (Walsh and Warren 1979). This quantitative compendium of the specific medical causes of infant and child mortality immediately suggested that a few low-cost 'technologies' — immunization, oral rehydration therapy, breastfeeding and antimalarial prophylaxis — might rapidly decrease infant and child mortality (Walsh and Warren 1979).

Unfortunately, this targeted approach was perceived to conflict with a major new strategy which had just been adopted by the World Health Organization at a conference in Alma Ata (1978). The meeting reaffirmed WHO's founding statement that 'health is a state of complete physical, mental and social well-being'. It then agreed that the means of achieving this lofty

goal was through primary health care, 'which reflects and evolves from the economic conditions and socio-cultural and political characteristics of the country and its communities' (WHO 1978). This broad approach included at least

education concerning prevailing health problems and the methods of preventing and controlling them; promotion of food supply and proper nutrition; an adequate supply of safe water and basic sanitation; maternal and child health care, including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; and provision of essential drugs (WHO 1978).

Several years later, however, UNICEF announced its Children's Revolution which focused largely on four

social and scientific advances [that] now offer vital new opportunities for improving the nutrition and health of the world's children. For all four actions, the cost of the supplies and technology would be no more than a few dollars per child. Yet that could mean that literally hundreds of millions of young lives would be healthier. And within a decade, they could be saving the lives of 20,000 children each day. It is not the possibility of this kind of progress that is now in question. It is its priority (Grant 1983).

These four initiatives were oral rehydration therapy, universal child immunization, the promotion of breastfeeding, and growth charts (Grant 1983). When it appeared that this targeted 'vertical' approach called selective primary health care might be implemented, it was considered to be in conflict with the World Health Organization's 'horizontal,' comprehensive primary health care strategy and was widely and strongly condemned. Banerji (1986) of New Delhi found 'an ominous similarity between the spread of a highly malignant cancerous tumor and the promotion of the technocentric approach by western countries' (p. 1233). Rifkin and Walt (1986) of London criticized an approach 'based on medical and technological interventions'. They believed that

radical health improvement will only come after a long period in which changes must occur on both levels of social, economic and political structures and on the level of individual and community perceptions (Rifkin and Walt 1986).

Over the last decade things have begun to shake out. Most important of all was the realization that no one approach or factor is responsible for the remarkable improvements in health statistics. A great moment came at a major international meeting in Talloires, France in 1988 when the Director General of WHO drew four vertical lines perpendicular to one horizontal line, and averred that the former enhanced the latter by providing 'knowledge and motivation'. In one fell swoop, Mahler resolved the five-year controversy between selective and comprehensive primary health care. This illustrates what a fruitless and negative exercise it is to support one means of improving health at the expense of another. Nevertheless, polarization is still alive and well. A recent editorial in *The Lancet* (1995), 'Fortress WHO: breaching the ramparts for health's sake', again takes a one-sided approach. Attention is called to the preamble to WHO's constitution which

recognizes the morality of global health interdependence, calls for individual, community, and national action, identifies societal factors as the main determinant of health status, and encourages work to ensure the fundamental conditions in which all people can achieve physical, mental, and social well-being.

There is no mention of biomedical research and medical interventions as possible determinants of the health of populations.

In order to rationalize health care and to make it affordable and universal whether in children or the old, whether in poor countries or rich countries, it is essential to know the specific problems we are facing. We need to base our actions on facts not opinions. If the facts are not available then we need to know that, and we must do our very best to find out what is going on. Given the vast variety of options, we need to know which interventions are effective and what they cost.

What is going on ?

‘The intellectual free lunch,’ a recent article by Kinsley (1995) in the *New Yorker* describes a University of Maryland opinion poll on foreign aid. It found that 75 per cent of Americans believe that the United States spends too much on foreign aid, and 64 per cent want it cut. When asked how big a share of the federal budget goes to foreign aid the average answer was 18 per cent. When asked the appropriate level of spending, the median answer was 5 per cent, and when asked how much would be too little the median answer was 3 per cent. The correct answer is less than 1 per cent. Kinsley noted that

people are forming and expressing passionate views about foreign aid on the basis of no information at all. Or perhaps they think that the amount being spent on foreign aid is a matter of opinion, like everything else (Kinsley 1995).

He makes the reasonable suggestion that

it is not asking too much to expect a citizen to recognize that he or she **needs to know** that number, at least roughly, in order to have a valid opinion about whether it is too large or too small (Kinsley 1995).

It is particularly disheartening that not only the general public, but ‘experts’ in biomedical research, public health, economics, even politics, are prepared to present their opinions on matters about which they have little or no factual knowledge. Even worse, governmental and international agencies often develop policies based on little or no knowledge. This is compounded by the fact that the data-starved developing world is virtually bereft of up-to-date information.

In order to develop rational and cost-effective strategies for health care it is important to know why people are getting sick, and the best way of doing this is by studying the age-specific causes of mortality. Beginning with infants and children under five years of age, it was believed, since the turn of the century, that protozoan and helminth parasites were the most important causes of disease during childhood in the developing world. Moreover, malnutrition was considered to be the major underlying cause of mortality, supposedly leading to enhanced susceptibility to infectious agents. This opinion was greatly fostered by McKeown’s (1976) claim that infectious diseases declined in the United Kingdom before the availability of vaccines and antibiotics. He ascribed this change to better nutrition due to greater food availability, and suggested that this was the principal cause of the observed decrease in mortality and consequent rise in population. Landers (1992) and others have recently discussed both the infectious disease and nutritional aspects of McKeown’s theory and found them wanting, thereby refuting McKeown’s claim that socio-economic development was virtually the only explanation for the rise of population. It was not until the magnificent studies of Mata (1978) in the village of Santa Maria Cauqu, in Guatemala that the crux of the problem became reversed, that is, repeated respiratory and diarrhoeal infections in very young children were the primary cause of malnutrition.

In the last several years those concerned with health in the developing world have realized that school-age children were particularly neglected. At a UNESCO meeting in 1989

it was suggested that ubiquitous infection by multiple helminth species in the tropics was the most important factor in poor primary school performance (Halloran, Bundy and Pollitt 1989). Fortunately, this realization came at a time when the development of several different types of oral, single-dose, non-toxic anthelmintic drugs made it possible to control virtually all of these infections at very low cost (Warren 1990). Soon thereafter micronutrient deficiency, especially in vitamin A, iron and iodine, was identified as another significant and easily remediable problem in this age group. The United Nations Development Programme, the Rockefeller Foundation, the James S. McDonnell Foundation, the Edna McConnell Clark Foundation and the World Health Organization have now organized a Partnership for Child Development that is exploring the effect of these problems on development and cognition, and inexpensive means of ameliorating them. A Scientific Coordinating Centre, led by Professor D.A.P. Bundy, has been established at Oxford University to provide expertise in the implementation and evaluation of school health programs in many countries in Asia, Africa and Latin America.

Young adults are now particularly prone to violent and accidental deaths. Furthermore, the remarkable spread of the almost invariably fatal Human Immunodeficiency Virus is having a major effect on mortality in this age group, especially in the developing world. There is very little at the moment that technology can do about these problems; they are now being dealt with largely by relatively inefficient social and political approaches.

In 1988 Walsh updated the data on the causes of mortality in the developing world for the United Nations Development Programme, but in this case included all age groups. While respiratory diseases came first, diseases of the circulatory system were second followed by diarrhoeal diseases, measles, injuries and neoplasms. Escovitz (1992) wrote of the health transition in developing countries in the context of a didactic role for specialists of internal medicine from the developed world. He pointed out the importance of gathering data on the prevalence, morbidity and mortality of the chronic diseases of the old, as had been done for the acute diseases of children. Furthermore, he spoke of the development of selective secondary and tertiary care strategies based on both effectiveness and affordability.

Which interventions are effective ?

In his book *Effectiveness and Efficiency* (1989) originally published in 1972, the great British epidemiologist, Cochrane, wrote:

When I was a medical student in London in the 1930s there was to be some rally about the possibility of a National Health Service in some London suburb, and I decided to go alone with my own banner. After considerable thought I wrote out my slogan: ALL EFFECTIVE TREATMENT MUST BE FREE. I had a deep inner feeling that this was absolutely right: although I doubt very much if I would have passed a viva on the meaning of 'effective'! The slogan, I regret to say, was a flop, ... but I still thought it had something (Cochrane 1989).

While this idea was quite remarkable, Cochrane simply could not lose. Thomas (1983) observed in his essay '1937 Internship' that hospitals were 'simply custodial'. 'Whether you survived or not depended on the natural history of the disease itself. Medicine made little or no difference'. Therefore, at the time when Cochrane carried his provocative banner very little effective treatment was available and the costs of health care based on this premise would have been minimal. The catch, however, was that in the 1930s there were no effective methods of determining whether a treatment was effective or not. It was not until the early 1940s that Austin Bradford Hill designed the randomized controlled trial to eliminate bias in the evaluation of interventions (Daniels and Hill 1952). The only other effective method is meta-analysis, which was developed by sociologists several decades ago to pool the results

from series of similar papers on the same subject. This powerful tool only began to be applied to medical interventions in the last ten to 15 years.

The problem with evaluating interventions is eliminating opinion based on personal experience, which almost always involves the observation of too few patients, and bias, which is often based on the laudable desire to achieve good results. At a recent New York Academy of Sciences meeting entitled *Doing More Good than Harm: The Evaluation of Health Care Interventions*, 1993, a variety of methods in addition to randomized controlled trials (RCTs) and meta-analyses (MAs) were evaluated. In 1977 the National Institutes of Health initiated a series of Consensus Conferences (Ferguson 1993) in response to the director Fredrickson's statement that

NIH and the rest of the scientific community must assume greater responsibility for the effect of research on the quality and cost of health care. The need for assuring effective transfer of useful new knowledge across the interface between biomedical research and the health care community and systems is a major issue.

The key to the process is a panel of scientists, clinicians, bibliometricians, and a public representative who are all interested in the general area, but have never done specific research on the problem. Because of its expense, no evaluation of the literature is done beforehand. Another approach, which is quite costly, was developed at the Rand Corporation; it begins with an exhaustive literature review, but then depends on a panel of nine distinguished practising physicians to decide which patients, if any, the procedures would benefit (Brook 1993). Finally, there is an approach with the particularly compelling name of 'outcome analysis'. It seems reasonable that if the outcomes of all interventions could be monitored, their efficacy would become immediately apparent. Unfortunately, this is simply not so, except in the simplest of situations where the results are particularly striking. Without randomized selection of patients and, in many cases the use of appropriate blinding, it is virtually impossible to eliminate opinion and bias. The usual outcome of outcome analysis is to follow-up interesting leads with randomized controlled trials.

Sir Richard Doll (1993) summed up the conference with these words: 'I conclude that we have need for both overviews (MAs) and large-scale simple randomized trials because they provide the only techniques for making small advances in the treatment of common conditions.' He added that if these matters were 'taken to heart by the profession and by those responsible for providing medical care [it] will ensure that the conference marks a turning point in the history of medicine in the developed world' (Wennberg et al. 1993).

A major advance in broadening the use of the best methods for evaluating interventions and the dissemination of the results thereof is the establishment of the Cochrane Centre in Oxford by the UK National Health Service Research and Development Programme. The Centre is led by Dr. Iain Chalmers, the senior editor of the first textbook of medicine, *Effective Care in Pregnancy and Childbirth* (1989), based on evidence largely provided by RCTs and MAs. His group also developed the computer software to prepare meta-analyses and to keep them up-to-date. An international network, the Cochrane Collaboration, has grown from this experience which prepares and maintains systematic reviews of RCTs covering all of the fields of medicine and health (Chalmers 1993). We now have the methods, both statistical and digital, for determining the effectiveness of treatment, and groups such as the Cochrane Collaboration are making a critical mass of such crucial information available, and keeping it current.

This leads to us to one area that is almost studiously avoided: the enormous utilization of alternative medical systems, not only in the developing world but the developed world as well. In China there is the vast, sanctioned world of traditional medicine. India has Ayurvedic medicine, for which 'Western medicine' may be the alternative. In the United Kingdom it is

well known that many members of the royal family, among others, have an interest in alternative medicine. For the United States, a recent study has examined alternative, unconventional, unorthodox forms of medicine, including relaxation techniques, chiropractic, massage, spiritual healing, herbal medicine, megavitamin therapy, energy healing, hypnosis, homoeopathy, acupuncture, and folk remedies. It was found that there were an estimated 425 million visits to unconventional therapists in 1990, exceeding all visits to primary care physicians (388 million). Expenditures on unconventional therapy were approximately \$13.7 billion, of which \$10.3 billion was out-of-pocket. This compares with \$12.8 billion spent out-of-pocket for all hospitalizations in the United States (Eisenberg et al. 1993). Under political pressure by the Congress, the National Institutes of Health has recently set up a program to evaluate alternative treatment, an initiative that should be going on all over the world. Unfortunately, meagre funds and political interference have led to the resignation of the first director of this important program.

The particular importance of such an initiative in the developing world is graphically described in a superbly controlled study of modern and traditional health systems in two Nigerian villages (Orubuloye and Caldwell 1975). These villages, one with good medical facilities (Ido) and the other with no facilities other than the traditional ones (Isinbode), were culturally and geographically as similar as possible and their social and economic indices showed no great difference except in the provision of medical services. Deaths per thousand among under-one-year-olds in Ido (medical facilities) were 99 compared with 288 in Isinbode (traditional); life expectancy at birth was 52 in Ido and 24 in Isinbode.

Application

A recent conference organized by the New York Academy of Sciences, *Doing More Good Than Harm* (Doll 1993), opened with a paper entitled 'All effective treatment could be free' (Warren 1993). This paraphrase of Archie Cochrane's famous statement was done advisedly, in view of the State of Oregon's recent development of a health plan that would not reimburse for ineffective or questionable therapies in order to afford more equitable health care. This pioneering approach, which the *Wall Street Journal* (1993) described as 'an unprecedented way to expand basic medical coverage to all people living in poverty,' was approved for implementation by the Clinton administration of the American government on 19 March 1993.

The basic concept of the Oregon plan is to 'prioritize health services in an era of limits' (Kitzhaber 1993). By eliminating categories covering minor conditions, futile care, and services that have little or no effect on health services, they were able to reduce costs so that 95 per cent of the population under the age of 65 were covered by the state health plan. Only part-time workers with incomes above the poverty level and seasonal workers were not covered. Those over 65 were enrolled in the federal Medicare program.

The process of prioritization was largely a social and political one. A Health Services Commission was created, consisting of five primary-care physicians, a public health nurse, a social worker and four consumers. They were charged with developing a list of services ranked in priority from the most important to the least important, according to the comparative benefits of each service to the entire population being served, and judged by clinical effectiveness and social values. The determination of clinical effectiveness was provided by panels of physicians who were asked to supply information about each condition-treatment pair in their areas of practice. It was recognized that 'this information provides a consensus by physicians rather than hard empirical outcomes data'. It is worthy of note that the prioritization process is dynamic and continuing with a new list generated each budget cycle 'to take into consideration new technologies and new information on outcomes' (Kitzhaber 1993).

Furthermore, the commission set up a broad-based public process to identify and integrate social values into the process, through extensive community meetings and a series of public hearings. The first priority list consisted of 709 condition-treatment pairs. Those ranked highest were for acute, fatal conditions where treatment prevents death and returns individuals to their previous health state. High values were placed on prevention, and maternal, dental and hospice care. The final priority list was given to an independent actuarial firm, which determined the cost of delivering each element through capitated managed care. On the basis of this information the Oregon legislature appropriated new revenue funding all condition-treatment pairs to line 587 on the list of 709. It is important to realize that this benefit system, modified over the years, will become the standard benefit offered by all private policies in the state. The Oregon plan, approved overwhelmingly by both houses of the state legislature, is clearly a social and political triumph. The 'scientific approach' to prioritization, however, while explicit, was unscientific, being essentially a matter of opinion.

This brings us to the enormous opportunity offered by the burgeoning of large-scale randomized evidence, now being gathered together by the global Cochrane Collaboration, and being maintained in continuously updated digital form. The combination of this sophisticated scientific evidence with the remarkable social and political process pioneered by the State of Oregon can truly offer the possibility that all effective treatment can be provided by comprehensive health systems at affordable cost.

Rationalizing health care

Health care systems in many parts of this aging world are grossly deficient. Even in countries where they have functioned well in the past they are breaking down because of high public expectations, inequities, inefficiencies and unsupportable costs. In order to have an efficient health care system it is essential to have quantitative estimates of the age-specific disease burdens in the population and to develop strategies for preventing and treating disease with known effective and, wherever possible, low cost interventions.

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