THE PERSISTENCE OF HIGH FERTILITY IN NEPAL

by

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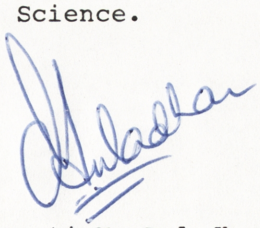

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ABSTRACT

For a number of years, the fertility level has remained high in Nepal. The government-supported family planning programme began in the late 1960s and expanded comparatively rapidly in the mid-1970s. But the use of contraception had not been widespread; consequently, levels of fertility remained unchanged at a high level. The low level of contraceptive prevalence and lack of fertility differentials suggest that Nepal, being a traditional society and economically having had little development to make any impression on the fertility level, is in a 'pre-demographic transition' phase.

This study analyses the reproductive behaviour of Nepalese women and in particular examines marriage and contraceptive use patterns in an attempt to identify the prime determinants of the persistence of high levels of fertility. It is based primarily on data from two surveys: the Nepal Fertility Survey(NFS), 1976 and the Nepal Contraceptive Prevalence Survey(CPS), 1981. Analysis of marriage and fertility was based on the data from the former survey and analysis of contraceptive use on data from the latter. Both these surveys are nationally representative sample surveys.

The analysis revealed a number of important findings which, partly at least, explained the sustained high fertility in Nepal. They are: high child and infant mortality; social customs which encourage early and universal marriage and a large family size with a strong preference for sons; low level of contraceptive prevalence due to limited knowledge of and access to family planning service outlet; and lack of socio-economic development activities.

To alleviate the economic and social problems resulting from rapid population growth requires not only a strong family planning programme but also other socio-economic measures if lower fertility levels are to be achieved in Nepal.

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CHAPTER 1

INTRODUCTION

1.1 POPULATION

The population of Nepal reached 15 million in 1981. It has almost doubled within the last 30 years. Until the end of the nineteenth century, Nepal's population was probably declining, mainly owing to high mortality. In contrast, the recent increase in the population has been largely due to a considerable decline in mortality with the implementation of public health programmes while fertility continued at a high level. With a continuation of the current rate of population growth, estimated at 2.7 percent a year in 1981 (Gorkhapatra, 1983), the population of Nepal would double again in approximately 25 years.

In 1971, the urban population of which more than half are from the Kathmandu Valley, constituted about four percent of the total population(Tuladhar et al., 1977:8).

According to the 1981 census, less than one-tenth (eight percent) of Nepal's population resided in the Mountains, about half (49 percent) in the Hills and the remaining 43 percent in the Plains. Population density which, overall, has reached 280 persons per square mile is rather uneven among these three regions. The Plains have the highest population density of 580 persons per square mile followed by the Hills with 310 persons per square mile and the Mountains with 60 persons per square mile. As would be expected, the cities and towns have much higher population density than rural Nepal.

A different picture emerges if population density of cultivable land is considered. The regions which are least able to support their population have the greatest population pressure on agricultural land (Tuladhar et al., 1977:11). The population density of cultivable land in the Plains, which have the highest proportion of cultivable land (40 percent), is the lowest, about 1400 persons per square mile of cultivable land, whereas the density is highest, about 3200 persons per square mile of cultivable land, in the Mountains where only two percent of the land is cultivable.

1.2 SOCIAL CHARACTERISTICS

1.2.1 ETHNICITY

There are more than 75 ethnic groups in Nepal. Many of them have their own languages. Although Nepali is the lingua-franca, there are thirteen distinct and strongly marked dialects spoken in the country (Hodgson, 1971:1). Exact statistics on ethnicity are not available. However, an approximation can be made based on the data on mother tongue. More than half of the Nepalese speak Nepali according to the 1981 census(Gorkhapatra, 1983). The Brahmin and Chhetri[1] groups, which comprise the majority of the Nepali speakers, are the dominant groups in Nepal. 12 percent of the population are Tamangs, Gurungs, Magars and Kiratis, who are the main tribals composing the Gurkha Regiments in the British and Indian Armies. Newars, who are distinctly urban settlers (Furer-Haimendorf, 1966:12) constitute about three percent and Tharus, a populous ethnic group in

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[1] Brahmin, Chhetri and untouchable castes are categorized as Pahari (Harris et al., 1973:47).

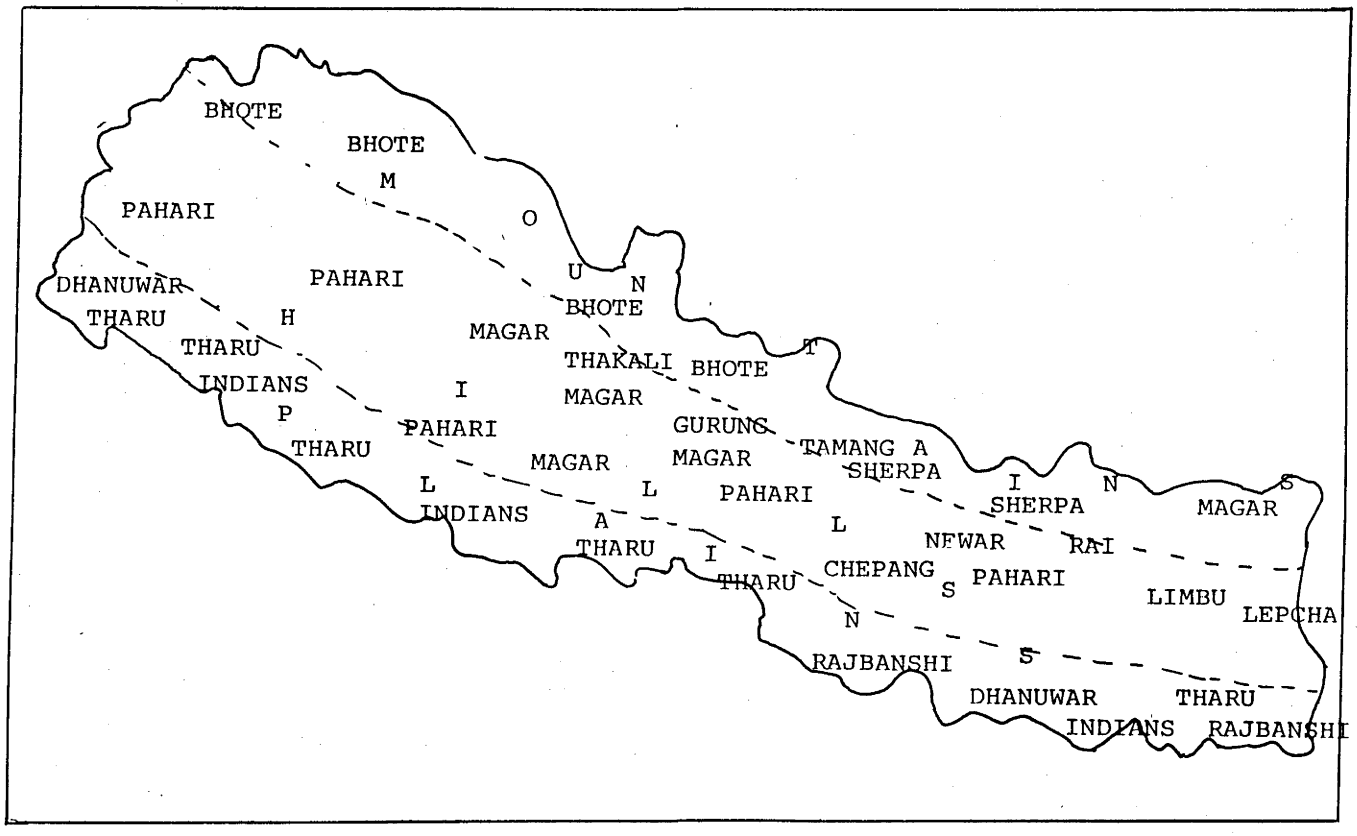

FIGURE 1.1: DISTRIBUTION OF ETHNIC GROUPS IN NEPAL

Source: Harris, G.L., et al.(1972), AREA HANDBOOK FOR NEPAL, BHUTAN, AND SIKKIM, U.S. Government Printing Office, Washington, D.C., p. 48

the Plains (Bista, 1972:118) constitute four percent of the total population. The more than 50 remaining groups form less than 30 percent of the total population. The distribution of selected ethnic groups in Nepal is shown in Figure 1.1.

1.2.2 EDUCATION

The proportion of literate population is extremely low in Nepal. Less than ten percent of males and one percent of females aged six years and over were literate in 1952/54, which was not surprising in view of the very limited public provision for education before 1948 (Kumar, 1967:136-139). The figures which were calculated based on the same age range (i.e. six years and over) have increased to 15 percent in 1961 , 25 percent in 1971 and 34 percent in 1981 for males. Compared to males, an increase in the proportion literate among females aged six years and over was relatively small. The proportions of literate females of the same age range were two percent, four percent, and 12 percent in 1961, 1971 and 1981 respectively.

1.2.3 OCCUPATION

The country consists predominantly of farmers. Of those who have been economically active, almost 95 percent are actively involved in agriculture and agriculture related works (CBS, 1975: table 20); this dropped to 91 percent in 1981. The proportion of females engaged in agricultural occupations is higher than that of males. In the remaining occupations, however, the proportion of males is higher than that of females.

1.2.4 AGE-SEX STRUCTURE

The age-sex structure of Nepal in 1971 indicates that the population is a very young one and has a high masculinity ratio. This is reflected by the fact that the population of children aged under 15 constitutes a little over 40 percent and the sex ratio of the total population is about 101.4 males per 100 females (CBS, 1977:57). The sex-ratio of the middle aged population is slightly affected by those who temporarily migrated to join the Indian and British Gurkha Regiments up to 1971. The sex-ratio of population aged 20-49 was 98 males per 100 females in 1971. This sex-ratio changed in 1981 showing that there were more males than females according to the 1981 census preliminary figures. There were 105 males for every 100 females in 1981. Likewise, the sex-ratio of population aged 20-49 also increased to 102 males for every 100 females in the same year. If this increase in sex-ratio is a genuine one, it could be attributed to two facts: (1) more males who were in the Indian and British Gurkha Regiments returned home, and (2) new recruitments, particularly for the British Gurkha Regiment, were virtually stopped.

1.2.5 MARRIAGE

In Nepal, marriage for women is almost universal. By the time women reach the age of 24 years, more than 90 percent of them have been married (Stoeckel *et al.*, 1976:81). However, marriage practices and age at marriage for females are slightly different from one ethnic group to another. Almost all ethnic groups in Nepal prohibit intercaste marriage although such marriages are now becoming more common in urban areas. Marriages are mostly arranged and patrilocal.

Apart from Brahmins, Chhetris (except a sub group, Thakuris) and Newars, the rest of the people preferred cross-cousin marriage (Bista, 1972; Ministry of Defence, 1965; Messerchmidt, 1976; and Nepali, 1965). But no group except Muslims allowed marriage between parallel cousins (Bista, 1972:154). Polyandry is accepted only among the people in the Mountains (Bista, 1972:163,179,183,191). There is no practice of bride-price except among Thakuris. However, it is expected that a bride receives gifts in kind from her family and relatives. A form of payment (dowry) to the groom is common among certain tribes of the Plains.

Among Brahmins and Chhetris, who constitute a major group in Nepal's population, marriages are considered a spiritual obligation rather than a biological, social or economic matter (Bista, 1971:10). On the other hand, the majority of Newars, especially peasants, consider marriage an economic factor, not viewed as a sacrament; this is mainly because Newari girls aged between four and eleven years have a ritual marriage with God Narayan (Nepali, 1965:198). Marriage among Newars is possible only if both boy and girl are from the same caste; but a man is not allowed to marry a woman who is related to him by blood. They take seven generations on both father's and mother's sides to look for a bride. Traditionally, horoscopes of a boy and a girl are matched by an astrologer to determine whether they can be a good couple before both parents decide on a marriage. However, with modernization, there has been a change in the selection of mates. Not only do Gurungs, Magars, Tamangs and Kiratis have freedom in selecting their mates, but Newari parents also let their young boys and girls see each other. A young couple's opinion is also considered when both

parents agree on marriage[2].

Among Gurungs, Magars, Tamangs and Kiratis, a boy and a girl have an opportunity to get to know each other before they get married. One of the places where Gurung teenagers meet is called a Rodi where girls invite boys to entertain them to dancing and singing and they may sleep together (Messerschmidt, 1976:49). Among Gurungs, premarital sexual relations were accepted until their Hindu neighbours pressured them to wait for marriage (Macfarlane, 1976:215). Tamang teenagers meet in a fair or at a market place where they may find their mates.

Many ethnic groups of the Plains also have different systems of marriage. While the people from the eastern Plains where the Tharus reside have a system of dowry which is a payment to the boy before marriage by the girl's father, a Tharu boy has to work for two to three years for his potential father-in-law before marrying (Bista, 1972:121).

In the cities and towns of Nepal, intercaste marriages, prohibited by most groups, are frequently seen. There are many people coming to cities and towns from different parts of the Hills and Plains for better jobs and education. Education is a factor which has made it hard to find an appropriate partner; as a result, intercaste marriage has become more common. However, children of this type of marriage, other than Brahmin and untouchable groups, maintain the caste status of the father (Caplan, 1974:58). Children of the remaining intercaste marriages carry the lower caste.

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[2] This particular stage is known as Mjah Sojagu. Literally, it means to see the body of a bride.

Widow remarriage is not very common in Nepal although the legal code and some communities allow it. Divorces and remarriages, however, occur mainly among lower castes. Sunwar, Limbu and Tamang societies allow marriage with one's elder brother's widow. Remarriage of a widow is very common among Sunwars (Bista, 1972:72).

1.2.6. VALUE OF CHILDREN

There are a number of reasons to believe that children are very important in a Nepali family. A newly married woman in her new home always has to follow what her mother-in-law says. There is not much freedom for her. Her life becomes more difficult if she does not have a child after a couple of years of marriage[3], because a woman with no child is looked down on in the society. Nepali law provides for a man to marry a second wife if his first wife cannot bear a child; therefore, a woman feels insecure until she has a child, and her status in her family will be upgraded once she has a child. Consequently, a childless woman may try anything to have a child. There is a belief that a woman will conceive a child if she fasts every Tuesday in the name of God, Ganesh and worships for eleven days. A Hindu woman also goes to a stone idol, a form of Bhairava with a long erect male organ, and worships and embraces Him in order to have a child. In the western Hills of Nepal, there is a temple of Manakamana, a Goddess of 'mind-wish'. Orthodox Nepalese pay a visit to the Goddess Manakamana and worship her to fulfil their wish. The condition is that one has to go only with one wish on each trip. Many childless women make such a visit wishing a child.

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[3] Under this circumstance, marriage generally means cohabitation.

Besides the social pressures to have a child, children in Nepal are valuable to the household economy. In a study conducted by Nag, White and Peet(1978:297), they found that the household economic situation was directly related to the number of children the household had. Children are also an insurance for old-age security. In Nepal, more than four-fifths of elderly persons live with their children or grandchildren (Nag et al., 1978:299).

According to the Hindu religion which is practised by 90 percent of the population, one of the prime objectives of marriage is to continue the line of progeny (Pokharel, 1970:64). A man must have a son in order to go to heaven after his death. A dead man's son performs a number of funeral rites to send the spirit of his dead father to heaven (Bista, 1972:15).

1.3 DEMOGRAPHIC SITUATION

Data on fertility and mortality were scanty until the mid-1970s. The censuses in Nepal are characterized by substantial underenumeration. The vital registration system began in April 1978 and was institutionalized in 21 of Nepal's 75 districts by January, 1980 (Kantner, 1980:1). Within the last decade, a number of national and district level sample surveys were carried out to measure fertility and mortality rates. In 1974/75, a longitudinal demographic sample survey was established in order to estimate the population growth rate of Nepal and its components, namely, fertility, mortality and migration both internal and international (Bourini, 1976:4). This study was conducted for three years. Data were analysed to estimate the fertility and mortality levels in Nepal by the Central Bureau of

Statistics with the help of the United Nations Fund for Population Activities. The mortality estimates from all those three surveys are too low to be believed correct. In 1976, the Nepal Fertility Survey was carried out in co-operation with the World Fertility Survey (Ministry of Health, 1977). In 1975, in four districts a Fertility and Family Planning Sample Survey was undertaken to collect baseline data on fertility and standard KAP (Knowlege, Attitudes and Practice) information (Nepal FP/MCH, no date:32-42). This survey was continued on a longitudinal basis in 1976 and 1978. Data were analysed by the Nepal Family Planning and Maternal Child Health Project staff in collaboration with The Population Council, Bangkok. To collect national level data on Family Planning knowledge, use and availability, the Nepal Contraceptive Prevalence Survey was conducted in 1981 (Ministry of Health, 1983:15). The first report of this survey was published with the help of Westinghouse Health Systems in 1983.

The data from the Nepal Fertility Survey (1976) and the Nepal Contraceptive Survey (1981) will be used in this thesis, and the methodology of the surveys will be discussed later in detail.

The various estimates of fertility have shown that the total fertility rate for Nepal is around six and has been more or less constant for a number of years. Differential fertility studies indicate that fertility is lower among urban than rural women. The total fertility rate for urban areas is 3.8 whereas the corresponding rural rate is 6.3 (CBS, 1978:3). The lower rate of urban fertility can be attributed to a high proportion of literate population, easy access to modern medical facilities and contraceptive methods, low

proportion of farmers etc. In addition to all of those reasons, it may also be due to the late marriage pattern in the urban areas. In rural areas, larger families are still valued for the labour the children contribute (Tuladhar et al., 1982:85). A number of studies have shown that the fertility rate for the Hill women is higher than for those in the Plains (Tuladhar et al., 1982:81-85; Ministry of Health, 1977:47). Higher fertility rates among the Hill women have generally been assumed to be due to the return of Gurkhas who may tend to make up for the missed time of exposure to reproduction with higher levels of reproductive performance, and lower child mortality (Tuladhar et al., 1982:82). During the early stages of marriage, mean number of children is slightly higher among the women who have some education and those who can read than those with no education or those who cannot read (Ministry of Health, 1977:42). Among the Hill women, fertility is lower among those whose husbands have some education than those whose husbands do not have any education. But the opposite pattern is found in the Plains (Tuladhar et al., 1982: 84).

Although mortality has been declining, the current level in Nepal is still among the highest in the South Asian region. The estimated infant mortality rate for 1970-74 was about 152 per thousand live births (Ministry of Health, 1977:48). Nepal still has considerable scope for reducing mortality with an implementation of public health programmes against malnutrition, measles, tuberculosis and other respiratory diseases, and water-borne intestinal infections.

1.4 POPULATION AND FAMILY PLANNING PROGRAMME

Though the Family Planning Programme was started as early as 1959 (Pande, 1975:143), the national programme was launched only in the latter part of 1968. The national programme was initiated with very broad objectives (Nepal FP/MCH, 1969:5):

> the ultimate goal of His Majesty's Government of Nepal Family Planning and Maternal Child Health Project is to bring about a balance of the various resources and population growth to improve the quality of human life and to realize this balance, the population of Nepal must be limited to a level of 16 to 22 million persons.

An ambitious target was set to provide IUD (intra-uterine device) services to 53,000 married females, sterilization to 8,000 males and the distribution of two million condoms and 23,000 cycles of oral pills in three years (Joshi, 1975: 213). During the implementation process, it was soon realized that the target was impossible to meet. In Nepal, there was one doctor for every 35,100 people, one nurse for every 51,100 people, and one midwife for every 17,800 people in 1978 (Nortman et al., 1982:34). Nepal, like most other countries, was providing family planning services through the health care system. Services were delivered through Family Planning clinics based in health institutions. No doubt the number of family planning acceptors increased year by year; most of them, however, were adopting condoms. Although oral pills have been propagated, they are a very complicated method of birth control for most women in the Nepali society. Given the level of education of Nepalese women, it is extremely difficult for them to remember when to start and how to take the missed pills, and they often stop taking the pills because of unexpected severe side-effects. The rate of continuation for oral pills was only 40

percent at the end of 12 months (Tuladhar and Gubhaju, 1977:57). The corresponding rate for condom users was, however, even worse: it was estimated to be only 20 percent at the end of 12 months (Pande, 1980:87).

According to the Nepal Fertility Survey(1976), 97 percent of those currently married women who wanted no more children were not using contraception (Westoff, 1978:15). It was soon realized that clinic based services were not enough. Firstly, information regarding family planning has not reached potential users. In 1976, less than one-fifth of the currently married women aged 15-49 were aware of a modern method of birth control (Ministry of Health, 1977:63) and only six percent knew where to go to obtain it (Rodriguez, 1978:101). Secondly, most villagers were not willing to go to often distant clinics to get family planning services. Over 50 percent of those who knew where to go needed to allow a full day's travel for the service (Rodriguez, 1978:102). Thirdly, potential users hesitated to visit clinics because they were not assured of privacy. Fourthly, follow-up of users and remedial action in case of side-effects were inadequate.

In order to overcome these problems, the Community Based Programme was launched in 1977. An experimental programme which began in 1971 to test this approach has proved that it ensured lower discontinuation and achieved a wider dissemination of information regarding family planning. In this approach, one family planning worker called 'Panchayat Based Health Worker', locally recruited by the local Panchayat, makes door to door visits as a motivator and a supplier of condoms and oral pills. These workers numbered more than

1500 by 1980. Almost all of the 3,000[4] village Panchayats in Nepal had some kind of family planning services available by the end of 1980. In addition, oral pills and condoms have been made available in the local market at a low price since 1977.

With all these efforts, current use of contraceptives has increased to approximately seven percent in 1981 according to the report of the Nepal Contraceptive Prevalence Survey (1983). The same study showed that a little over five percent of currently married women accepted sterilization. In 1976, there were only two percent of couples protected in this way. Service statistics also indicate that the number of female sterilizations has increased during the past five years. Public demand for female sterilization is so high now that the services are not in a position to meet it. The proportion of currently married women who knew at least one modern method increased from 23 percent in 1976 to 52 percent in 1981.

1.5 AIMS OF THE STUDY

As explained above, there was very little demographic information to work with before 1975. In consequence, very little work has been done on the analysis of fertility and contraceptive differentials with the exception of two studies, the Nepal Fertility Survey(1976) and the Longitudinal Fertility and Family Planning Survey (1975-78). The former being a national sample, it has attempted to provide a general description and did not elaborate in detail, largely because of the limitation of survey data. The latter, being an area sample survey,

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[4] The number of Village Panchayats has been raised to 4,051 recently.

attempted to investigate differences among women using only two socio-economic characteristics, husband's education and landholding, as explanatory variables. The Nepal Contraceptive Prevalence Survey(1981) report presented a broad picture on the status of family planning knowledge, ever use and current use of contraception. Differentials in knowledge and use of contraception were derived from simple cross-tabulations.

It is extremely important for the Population and Family Planning Programme to identify where the differences are in levels of fertility and contraceptive use between various regions and subgroups of the country and identify the prime determinants of persistent high levels of fertility. The main concern of this research is to identify key reasons why a high level of fertility persists in Nepal.

The overall objective of the thesis is to describe and analyse the fertility behaviour of Nepalese women. The analysis will be based on the theoretical concepts relating to persistence of high fertility and to the beginnings of fertility decline. Chapter 2 will review theories developed in the context of the study of fertility. At the beginning of the chapter, the concept of demographic transition will be assessed, followed by the review of fertility theories that have been developed by the sociologists and economists. On the basis of these theories, a conceptual framework will be suggested as a guideline for the present study.

Chapter 3 will deal with the evaluation of the quality of data from the two sources mentioned earlier. Following the introductory section, the survey methodologies of the Nepal Fertility Survey (1976) and the Nepal Contraceptive Prevalence Survey(1981) will be described.

The response errors will be dealt with in two sections. The first section will concentrate on the response errors which may affect the demographic estimates. The extent of age misreporting, omission of births and reference errors will be presented. In addition, the effect of the errors on estimated fertility levels and trends will be described. The second section will present the reliability of contraception data in the Nepal Contraceptive Prevalence Survey (1981). The extent of biases in the knowledge, ever use and current use of contraception will be presented.

Chapter 4 describes the marriage and fertility patterns based on the Nepal Fertility Survey (1976). The marriage pattern will be described in two sections: marriage formation and marriage dissolution. Thereafter, differentials in age at marriage will be analysed. An attempt will be made to explain these differentials from the findings of largely anthropological studies. This will be followed by the examination of levels and trends in widowhood, divorce and separation. Assuming that age at marriage is a major factor in fertility differentials, the results of bivariate and multivariate analyses of fertility differentials will be discussed.

The remaining chapters (five to eight) will deal with the use of contraception which is one of the most important factors that bring a decline in fertility. Chapter 5 will present detailed facts on the Population and Family Planning Programmes in Nepal. More specifically, it will concentrate on the evolution of population policies in different development plans and their implementing structures.

Chapter 6 will explore the factors which relate to use and non-use of contraception. The section on demographic factors will deal with the level of current contraceptive use according to the age of woman, number of living children and number of living sons. The fertility preference section will focus on differences between subgroups in the desire for more children. In addition, this section will concentrate on finding out the extent of demand that the family planning programmes have met and the extent to which Nepalese women's behaviour was consistent with their expressed family size desires. The former will be discussed under the concept of 'unmet need', the latter under the concept of 'gap' between desire and use. The next section will discuss the level of current contraceptive use according to socio-economic indicators, namely, education of woman and husband, work status of woman and ethnicity.

The final section of Chapter 6 will describe the current contraceptive use patterns according to place and geographical residence. This will be followed by the extent of knowledge on availability of the family planning service outlet and access to it. Finally, their effects on the prevalence of the current contraceptive use will be assessed.

Chapter 7 will be an extension of Chapter 6. The findings of Chapter 6 will be based on bivariate(or at most trivariate) analysis. Results based on the multivariate approach will be presented in this chapter. The Generalized Linear Model will be used for the analysis.

Chapter 8 will attempt to present the overall effect of the family planning programme on fertility in Nepal. Several techniques, such as birth interval analysis, births averted, regression model and

Coale-Trussel index will be applied to assess the impact of the contraceptive programme on fertility. Data will be drawn not only from the survey but also from the family planning service statistics.

Chapter 9 will summarize the findings and draw conclusions regarding the factors that underlie high fertility in Nepal. An attempt will be made to link the conclusions with theoretical considerations of fertility decline.

CHAPTER 2

CONCEPTUAL FRAMEWORK

2.1 INTRODUCTION

The demographic transition theory -concerning the transition from high mortality and high fertility levels to low mortality and low fertility levels- is an outstanding theory in the field of population study. The development of this theory was based on European experience, where fertility decline in most cases was accompanied by or preceded by decline in mortality. As Notestein (1952:13-31) indicated, changes in fertility and mortality took place in conjunction with economic development in the West. The important factors that are believed to have caused reduction in fertility were: the growing importance of the individual rather than the family, and particularly the decline of the extended family group; the development of a rational and secular point of view; the growing awareness of the world and modern techniques through popular education; improved health; and the appearance of alternatives to early marriage and childbearing as a means of fulfilment and prestige for women. Notestein particularly emphasized the role of popular education which might stimulate an innovative and rational view of life, enhance the importance of the individual as opposed to the extended family group, improve the status of women, and substitute the ideal of a healthy, prosperous family for that of a large family.

Davis (1957:88-95) explored factors that kept under-developed areas at high fertility levels even though many countries have experienced a sharp decline in mortality. He hypothesized that

institutional factors were responsible for high fertility in the developing world. Davis further elaborated as follows:

> In analyzing the institutional factors responsible for fertility, one finds the main key in the family, for human society accomplishes the function of bearing, nourishing, and socializing children primarily through the universal instrumentality of the nuclear family. It is through the relations of the nuclear family to the rest of society, then, that we can expect to find the social factors controlling the level of fertility.(1957:89).

The weakness of the demographic transition concept became apparent when the process of demographic change in European countries was examined in greater detail using historical demographic records (Coale, 1975:347-355). The concept fails to define the specific levels of a set of variables that are required for fertility decline. As Coale (1975:352) pointed out:

> The weakness of the concept is associated with the difficulty of defining a precise threshold (a check list of essential characteristics, or a combined score on some socio-economic scale) of modernization that will reliably identify a population in which fertility is ready to fall.

In view of the fact that there was a wide diversity of conditions in which marital fertility declined, Coale (1975:352) listed three general prerequisites of a major fall in marital fertility:

> (1) Fertility must be within the calculus of conscious choice. Potential parents must consider it an acceptable mode of thought and form of behavior to balance advantages and disadvantages before deciding to have another child- unlike, for example, most present day Hutterites or Amish, who would consider such calculations immoral and consequently do not control marital fertility;
>
> (2) Reduced fertility must be advantageous. Perceived social and economic circumstances must make reduced

fertility seem an advantage to individual couples;

(3) Effective techniques of fertility reduction must be available. Procedures that will in fact prevent births must be known, and there must be sufficient communication between spouses and sufficient sustained will, in both, to employ them successfully.

Kirk (1971:125) argued that attempts to establish fertility decline thresholds should concentrate on cultural factors or cultural regions, such as Latin America, East and Southeast Asia, Moslem countries, African countries and so on to define more homogeneous regions where there might be a better chance of identifying levels of development required before fertility declines will occur. He saw the great importance of culture in influencing fertility declines and that socio-economic factors act within given cultural settings which themselves have a strong influence.

The remainder of this chapter will discuss the different theories or frameworks available so far to study the determinants of high fertility or fertility decline. Based on these theories, a framework will be proposed for the present study.

2.2 SOCIOLOGISTS' FRAMEWORKS OF FERTILITY

One of the well known frameworks for the study of fertility is by Davis and Blake (1956:211-235). This framework is focused on the institutional mechanisms in society and lists eleven intermediate variables through which, and only through which any factor - biological, social, psychological or cultural- must operate upon individual fertility. Davis and Blake categorize these eleven intermediate variables into three groups as follows:

I. Factors Affecting Exposure to Intercourse ('Intercourse variables').

A. Those governing the formation and dissolution of unions in the reproductive period.

1. Age of entry into sexual unions.
2. Permanent celibacy: proportion of women never entering sexual unions.
3. Amount of reproductive period spent after or between unions
   a. when unions are broken by divorce, separation, or desertion.
   b. when unions are broken by death of husband.

B. Those governing the exposure to intercourse within unions.

4. Voluntary abstinence
5. Involuntary abstinence (from impotence, illness, unavoidable but temporary separations).
6. Coital frequency (excluding periods of abstinence).

II. Factors Affecting Exposure to Conception ('Conception variables').

7. Fecundity or infecundity, as affected by involuntary causes,
8. Use or non-use of contraception.
   a. By mechanical and chemical means.
   b. By other means.
9. Fecundity or infecundity, as affected by voluntary causes (sterilization, subincision, medical treatment, etc.).

III. Factors Affecting Gestation and Successful Parturition ('Gestation Variables').

10. Foetal mortality from involuntary causes.
11. Foetal mortality from voluntary causes.

Each of these eleven variables affects positively or negatively the fertility of individuals in a society. In an underdeveloped society, four of the eleven intermediate variables, i.e. age of entry into sexual unions, permanent celibacy, contraception and sterilization, have high values which tend to keep fertility high. Three of the intermediate variables, time between unstable unions, post-widowhood celibacy and foetal mortality from voluntary causes, may have high or low values; and variables such as voluntary

abstinence and foetal involuntary mortality usually have low values. The remaining three variables, involuntary abstinence, frequency of coitus and involuntary sterility are left as indeterminate. All of them are grouped, according to Davis and Blake, as high or low in the following fashion in pre-industrial societies:

Usually High Values	Usually Low values
1. Age of entry in unions	4. Voluntary abstinence
2. Permanent celibacy	10. Foetal mortality-involuntary
8. Contraception	
9. Sterilization, etc.	

High or Low values	Indeterminate
3a.Time between unstable unions	5. Involuntary abstinence
3b.Post-widowhood celibacy	6. Frequency of coitus
11.Foetal mortality-voluntary	7. Involuntary sterility

One of the assumptions Davis and Blake made was that underdeveloped rural societies had a much higher fertility than urban industrial societies. In a cross-cultural study of 61 societies, M. Nag (1968:142) found that not all nonindustrial societies had uniformly high fertility. H. Yuan Tien (1968:142) noted that some urban-industrial societies exhibit a somewhat higher fertility than a number of the underdeveloped areas.

Hill, Stycos and Back (1959:218-249) proposed an interaction model to explain factors underlying individual fertility through use of effective family planning methods. They included a set of five interacting variables in blocks. The analytic model proposed by them is shown in Figure 2.1.

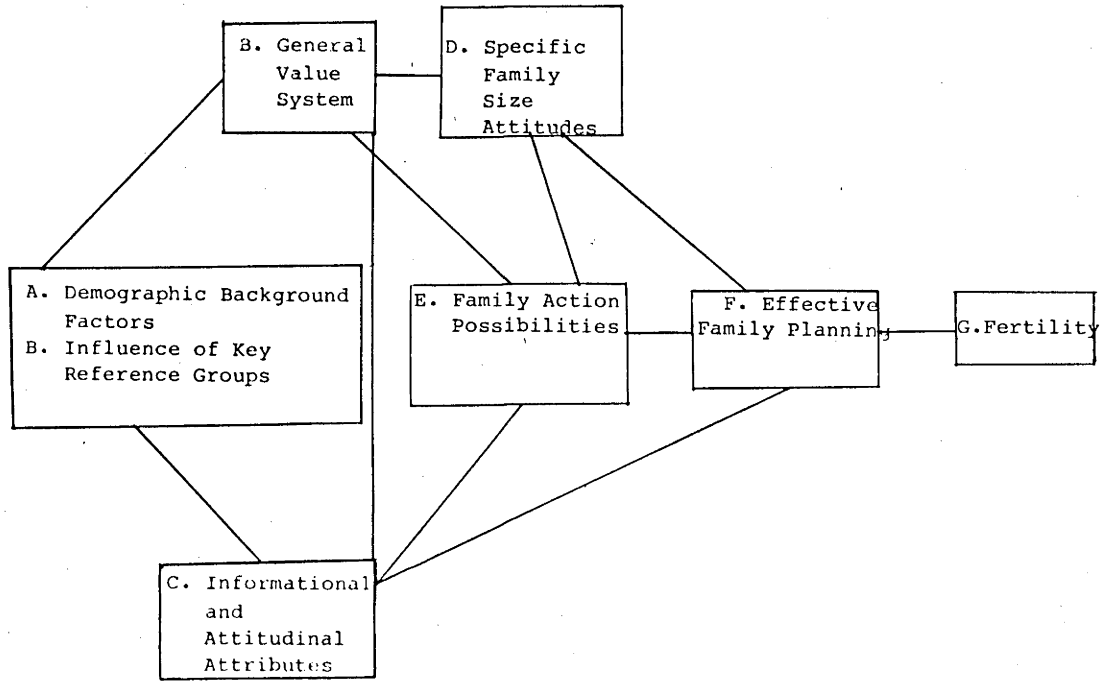

FIGURE 2.1: SCHEMA SPECIFYING THE HYPOTHETICAL INTERRELATIONSHIPS OF SELECTED ANTECEDENT, INTERVENING, AND CONSEQUENT VARIABLES IN FERTILITY PLANNING.

Source: Hill, R., J.M. Stycos, and K.W. Back, THE FAMILY AND POPULATION CONTROL, University of North Carolina Press, Chapel Hill.

In Block A, the demographic background factors, such as residence, occupation, education, religion, economic status, type of marital union and age at marriage are related to adoption of family planning methods and in turn affect fertility behaviour through four intervening variables represented by blocks in the model. In Block B, changes in general value systems relating to fatalism, traditionalism, aspirations for self and children and general planning affect two intervening variables, namely attitudes toward family size and family action possibilities, which affect use of contraceptive methods. In their model, variables involving attitudes towards family size (Block D) are important intervening variables leading to adoption of family planning. Specific 'family size attitude' variables, like attitude toward importance of children, ideal family size (present and past), summary index of family size preferences, sense of pressure of fertility on family resources and interest in spacing children, are directly related to adoption of family planning methods and are affected through other intervening variables, so called 'family action possibilities' (Block E).

Block C (information and attitudinal attributes) in the model refers to individuals' perceptions about availability and accessibility of birth control methods. The extent of knowledge about birth control and its availability as perceived by individuals, attitudes toward such methods and extent of agreement on birth control reflect on use of family planning directly or through other intervening variables shown in Block E. The next important set of variables through which operate most of the proposed intervening factors related to the use of family planning are 'family action possibilities'. This particular block refers to two general aspects

of the family: 1. extent of consensus on general family problems; and 2. extent of consensus on solving these problems. Both aspects are assumed to be governed by the type of family structure.

Another framework which deals with a normative approach is suggested by Ronald Freedman (1975:1-21). His basis of argument is that the intermediate variables are not always used to limit fertility and often their effect on fertility is an unintended result of cultural patterns. Freedman introduced two types of norms in his model, namely, norms about family size and norms about intermediate variables. This model is presented in Figure 2.2.

The intermediate variables generally operate together with the effects of norms about family size and norms about intermediate variables. Norms about family size are influenced by varying life style related to position in a status hierarchy. Status indicators, such as education, occupation, income, wealth, power, prestige, caste and general class indicators may influence the desired number of chilren. Differences in life style may influence norms about intermediate variables directly or through norms about family size. Social organization such as a family planning programme that has a goal to reduce fertility may influence the norms about family size or norms about intermediate variables and may control intermediate variables, for instance, use or non-use of contraception. Social organization such as a family planning programme may involve, without explicit reference, either of the norms or may influence the intermediate variables which in turn affect fertility behaviour.

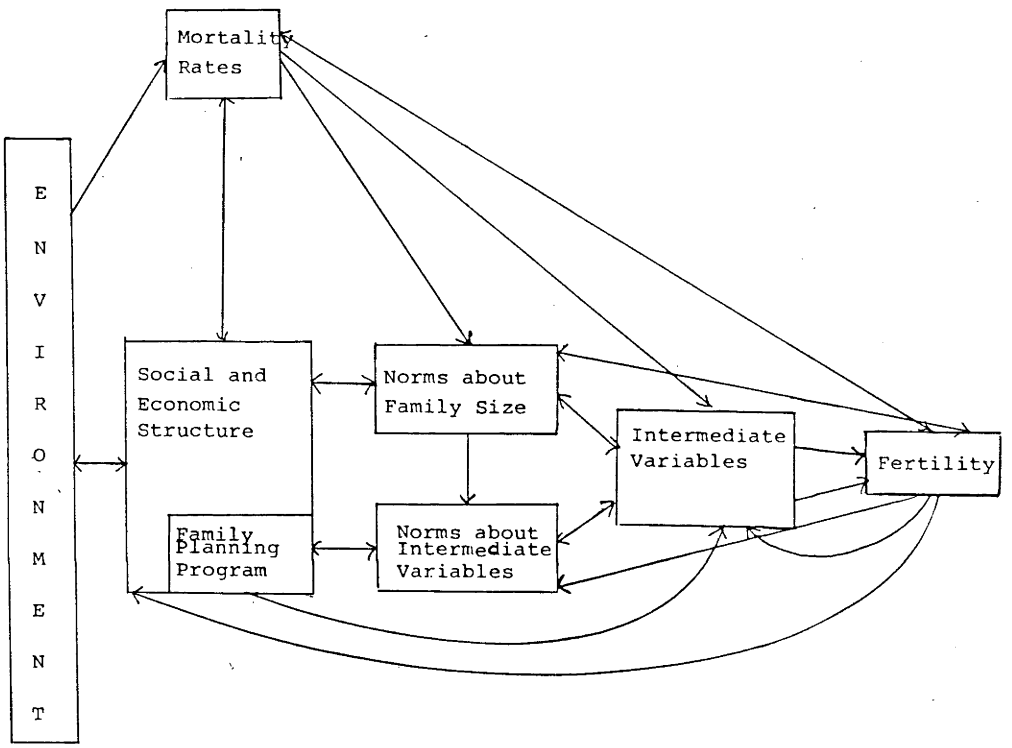

FIGURE 2.2: A MODEL FOR THE SOCIOLOGICAL ANALYSIS OF FERTILITY LEVELS.

Source: Freedman, R., THE SOCIOLOGY OF HUMAN FERTILITY: AN ANNOTATED BIBLIOGRAPHY, A Population Council Book, Halsted Press Division, Wiley, New York.

2.3 ECONOMISTS' THEORIES OF FERTILITY

Leibenstein (1972:458) is of the opinion that sociologists or demographers lack theories for the study of fertility. He argued that sociologist-demographers took the bits and pieces of knowledge in their stride, but economists would have found these bits and pieces aesthetically unfulfilling. Further, he suggested that the reasons for the fall of fertility listed by demographers were very partial and a plausible argument could be developed about how these elements contributed towards reducing desired or actual fertility or both. At the same time, he accepts the fact that a narrowly constructed, strictly economic approach is unlikely to be successful.

He argues that part of the change in fertility is accounted for by the direct choices of the population in the process of determining the number of children they desire. These in turn depend on an assessment of the benefits, in terms of utility and/ or satisfaction, broadly defined, and costs, also in turns of utility and/ or satisfaction, that are attributed to children during significant marginal controllable situations.

Leibenstein (1975:1-31) has recently propounded a new explanation of the decline in fertility accompanied by economic development. His recent explanation takes account of his own previous theory of fertility (1957); in addition, it incorporates a criticism voiced on the quality of children, and a new theory of consumption based on social status considerations that are critical to the explanation of the utility cost of children. In an attempt to expand his recent theory, he suggested that direct and indirect costs of children were

not sufficient to explain the entire decision process which determines the observed inverse relation between family size and income level.

In his approach, emphasis has been placed on two aspects of the process of urbanization and occupation shift: (1) the shift of greater proportions of the population into higher socio-economic status than would have been the case had the country remained at its lower income level; and (2) the simultaneous growth of per capita income. These factors influence the utility attached to children and the utility of the typical expenditure patterns of households which in turn determine the utility costs associated with children.

On the assumption that income distribution remains unchanged in the long run, a relative income compression effect will operate as development occurs on the basis of the following reasonable hypotheses (Leibenstein, 1975:6):

> (1) Families have a strong desire to avoid a fall in status; (2) Some families will want to emulate those in higher statuses for themselves or for their children; (3) Services are disproportionately involved in 'status goods' ; and (4) Families try to maintain a strong status differential through their expenditure patterns.

When a significant portion of income is needed to meet the requirement for status goods, such a requirement is met at the expense of non-status goods which include children. An increase in expenditure occurs due to a movement from lower to higher status. At the same time, expenditure on services like educational cost of children will also rise. As a result, there may be a possibility of fall in status, but fall in status does not cause a decrease in expenditure, because people do not like to acknowledge a fall in

status. It is argued that there is a utility cost of children that is associated with each status.

Combining a utility function with the utility cost, the household will have an incentive to have the i-th child as long as the utility of the i-th child (Ui) is greater than the utility cost of the child (Uci) when the utility cost functions include status (IMU- increasing marginal utility) goods. Leibenstein argued that there is a 'switch point' income level, up to which the household favours an i-th child (Ui > Uci). After this income level (Uci > Ui) the household will be against having the i-th child. Thus, the utility of higher parity children declines as the status-IMU goods become relatively important.

Jones (1977:24) questioned whether Leibenstein had perhaps exaggerated the importance of status considerations in people's preference functions and childbearing decisions and whether there was any way to test empirically the validity of the theory. He suggested that there might be a benefit in combining this approach and the demand theory.

The 'new household economics' or 'demand theory' is basically the product of research that has been carried out by Becker (1960 and 1965) and elaborated on by many other economists. This theory treats the desire for children as equivalent to the demand for consumer goods such as cars, houses, and refrigerators. Becker argues that children are not inferior goods; therefore, there is a positive relation between income and a desired number of children. Children like other commodities provide utility to consumers. The reasoning behind this is that there is a satisfaction in owning commodities. He assumes that the utility of children is not constant, but depends on their

quality. High-quality children have high utility but they also cost more. The type of utility function operating under such conditions is determined by 'tastes' which are, in turn, determined by various background factors such as culture or religion. In order to afford higher quality children, higher income families wanted to 'buy' fewer children. The reason parents demand fewer children as income rises is that the price effect (the much higher cost per high-quality child) outweighs the income effect (wanting more children because income has risen).

Becker has also considered 'uncertainties' of production and 'birth control' factors in his model. He argues that the 'uncertainty' factor will take account of such aspects as that producers (parents) cannot control sex and physical characteristics of the next child. Introducing a contraception factor, he argued that the relation between actual fertility and income would equal that between desired fertility and income if knowledge of contraception techniques did not vary with income.

Becker's theory was criticized by both sociologists and economists. Judith Blake (1968:1-25) challenged the entire theory on the grounds that children could not be treated as consumer durables. Before attempting to re-examine the relevance of Becker's framework, she evaluated Becker's assumption of a positive relationship between income and desired family size. Her conclusion was

> ...the data on income and family size presented by Becker turn out to be either biased in favour of his thesis through sampling distortion, or irrelevant by virtue of being cases in which children had the status of being production goods rather than simply consumer goods.(Blake,1968:11).

Blake also reviewed Becker's framework and criticized him for disregarding well-known sociological determinants of reproductive motivation. She pointed out four such features: (1) the analogy of children with consumer durables; (2) the concentration on the 'consuming' as against the 'producing' role of parents with respect to children; (3) the misapprehension of child cost; and (4) the failure to analyse the utilities involved in having children.

With regard to the first, she held the view that there is no direct control over children as there can be over the acquisition of cars, refrigerators and houses. Freedom to choose the number of children extends beyond the control of the individual as there is no flexibility in the consumption of children so as to maximize their utility as is the case with other commodities(1968:17):

> If the parents miscalculate and find that the marginal utility they actually derive from an additional child is less than they would have had from an expenditure on something else, they cannot, normally, adjust the situation.

Unlike with other commodities, parents are not allowed to treat children as they wish but are bound by many conditions and restrictions.

The second feature concerns the production of a socialized child which is the product of the interaction of children with one another. Though siblings are not necessarily important for such interaction, substitution of non-siblings can be difficult due to the isolation of the nuclear family. In addition, parents are bound to follow societal norms to produce a minimum level of quality by, for instance, providing education, health care, and so on.

The third feature has to do with direct and indirect costs relating to children. Blake pointed out that Becker ignored indirect costs or opportunity costs, i.e. alternative utilities on which parents could expend their resources. Direct costs, i.e. the resources actually expended on childbearing and rearing were considered. Blake criticized Becker for overlooking two points with respect to direct costs: (1) parents might find it difficult to separate clearly the level of living of their children from their own, and (2) the way of life at a given social level might put its mark on standard of child quality as well.

The fourth feature concerns the following two assumptions regarding the utility of children which Becker applied in his theory: (1) there is no family-size threshold below which even poor couples will strongly resist falling; and (2) there are no systematic social class differences in the relative utilities or taste for children which limit the family-size desires of the well-to-do. Blake rejected these two assumptions on the ground that familial institutions motivate almost everyone to have some children and non-familial institutions create a sense of disutility in large families, in particular among the affluent ones.

A further complication was introduced by Easterlin(1969:129), who argued that observed income at one point in time might not be a valid relevant concept but one needs to consider potential income flow through time.

Namboodiri (1972:185-206) attempted to modify the model taking most of the above criticisms into account to make it more widely applicable in fertility research and theory building. He demonstrated

that it was necessary to conceptualize interrelationships among the utilities of children of different birth orders, as decisions about having children were probably sequentially made.

Jones (1977:14) recognized the fact that treatment of mother's time is a positive contribution by the theory of 'new household economics', but argued that it failed to develop a proper classification. The microeconomic theories of fertility have a drawback in the sense that they are not able to be tested empirically due to lack of adequate data. Jones (1977:18) examined the household model and pointed out five reasons why the household model is not 'at home' in low-income countries:

> 1. child-care assistance with an almost zero opportunity cost is commonly available within the household, in the form of servants. Moreover, many market activities in which women engage can satisfactorily be combined with child-care;
>
> 2. the variants of the demand theory of fertility where the price effect depends on the value of the mother's time are highly culture bound;
>
> 3. the concept of 'household utility maximization' is even further divorced from reality in many developing countries than in the West, because of household structure and the network of mutual obligations with kinfolk;
>
> 4. in many developing countries, children's role as 'consumer durables' is outweighed by their role as productive agents and as a source of security; and
>
> 5. in many developing countries the 'supply constraint' looms large. There is a section of every population whose 'natural fertility (....) is below their desired fertility, perhaps because of sterility or subfecundity, perhaps because of certain practices, such as a taboo on intercourse while the mother is breastfeeding which inadvertently lower fertility.

Easterlin (1975:54-63) developed an economic theory which incorporated the concepts used by non-economists. The main deviation of his theory of fertility from the usual economic theory (i.e. the concept of 'demand theory' or the concept of 'household production') is the inclusion of the concept of production of children which recognizes the concept of natural fertility. He sees the determinants of fertility working through one or more of the following:

> 1. the demand for children , Cd, the number of surviving children parents would want if fertility regulation were costless;
>
> 2. the potential output of children, Cn, the number of surviving children parents would have if they did not deliberately limit fertility; and
>
> 3. the costs of fertility regulation, including both subjective (psychic) costs and objective costs, the time and money required to learn about use specific techniques.(pp.55).

In the economic theory of the household, the demand for children, Cd, is determined by taste, prices and income considerations. It is deemed that sociologists' terms, such as norms regarding family size and the 'quality' of children, operate through tastes or subjective preferences. In a situation where tastes, prices and income are constant, fertility might vary due to changes in the survival prospects of children. The potential output of children, Cn, depends on natural fertility and the probability of a baby surviving to adulthood. The motivation for fertility regulation is determined by the joint factors of the potential output of and demand for children. There will be a shortfall in the potential output if $Cn < Cd$ which means that there is no desire to limit fertility. If $Cn > Cd$, parents would have more children than they wanted which leads to a motivation

to regulate their fertility. Motivation is a necessary condition for fertility regulation but is not a sufficient condition. The degree of fertility control depends on the costs of fertility control. Thus, fertility regulation is expected to occur in a situation when there is a greater degree of motivation (i.e. Cn > Cd) and lower costs of fertility control.

Jones (1977:29) pointed out that Easterlin's model could be useful as a broad framework. It needs to be tested by detailed analysis of the factors influencing supply of and demand for children in different cultures, over time, and among couples. He points out one weakness of Easterlin's approach, that is the use of an 'average' couple, with its 'average' supply curve of children, 'average' budget line and 'average' indifference curve between children and goods, that are supposed to represent the society as a whole. He further pointed out that

> In reality, however, there is an offsetting factor making for fertility 'overshoot': people in basically noncontracepting societies do not have to choose to have children. Choice enters only at the point of deciding not to have them. In this situation, people's basic inertia will delay adoption of contraception and make for fertility higher than desired.(1977:30).

2.4 WEALTH FLOWS THEORY

The 'Wealth Flows Theory' was developed in the quest for reasons why large families were better off either in their contemporary condition or in their past experience of relative socioeconomic mobility (Caldwell, 1976:171). Small families were often less successful economically and not strong and powerful in the village

setting.

The theory assumes that fertility behaviour in both pre-transitional and post-transitional societies is economically rational. In a society where there is stable high fertility and no economic gain to the family from lower fertility levels, the intergenerational net wealth flow is from the younger to the older generations. In a society where there is economic gain to the family, the intergenerational net wealth flow is from the older to the younger generation; thereby, since parents have no benefit from higher fertility levels, fertility will decline.

Caldwell (1976:343-344) points out that there are at least six different economic advantages of children to one or both parents which might have kept stable high fertility levels in pre-transitional rural societies. They are:

> 1. Situation gain is of particular importance to patriarchal males.... As the number of children beyond infancy grows, and, indeed, as the number of wives and ultimately the number of children-in-law increases, it is inevitable that the person on top of the pyramid controls more resources and has access to more services (as well a enjoying more obvious power), even if per capita income remains static;
>
> 2. Children work in the household and on the farm not only producing goods but providing a range of services that adults regard as wholly or partly children's work and that they are loath to do themselves;
>
> 3. Adult children usually assist their parents, especially with labor inputs into farms;
>
> 4. Adult children provide particular assistance in making up the family contributions to community festivities and to such family ceremonies as marriages, funerals, and celebration connected with births;
>
> 5. The care of aged parents, who may insist on having their farms, business and households propped up as if they were still running them, can be a major undertaking; and

6. Parents can invest in training or education of children so as to increase their ability to make returns.

Caldwell claims that even in the transitional society there will be sustained high fertility levels, which are rational in nonagricultural urban conditions, as long as the flow of wealth is predominantly from the younger to the older generation. He defines as 'transitional' a society where there are rapid changes in the way of life, especially changes in the impact of children and in the possibilities available to parents for limiting the number of their children.

Decline in fertility levels is attributed to changes in the family system. The larger family tends to keep weak emotional links between spouses and denies a strong link between young children and their biological parents. On the other hand, the small nuclear family has strong emotional bonds and demands greater egalitarianism in family consumption (Caldwell, 1982:180). As children become more expensive and the return from investment becomes less rewarding, i.e. 'wealth flows' are mostly from parents to children, there is no economic rationale in having a large family.

Caldwell (1980:227) argues in his later paper that mass education may be a fundamental determinant which will bring fertility from high to low levels. The effect of education works through the restructuring of family relationships which in turn affect family economies and the direction of the net wealth flow. He suggests that education has an impact on fertility because: (1) education reduces the child's potential work inside and outside the home; (2) it increases the cost of children; (3) schooling creates dependancy, both within the family and within the society; (4) it speeds up

cultural change and creates new cultures; and (5) the school serves as a major instrument for propagating the values, not of the local middle class, but of the Western middle class. He further points out that demographic change is unlikely to penetrate if the movement toward mass schooling is restricted to males only.

2.5 PROPOSED CONCEPTUAL FRAMEWORK

From the preceding discussion, it should be noted that the study of fertility determinants is very complex. There exist many theories or models developed by various scholars, but there are also numerous controversial issues. One of the main deficiencies in the existing models is the lack of adequate data to test every variable in the model. One must admit that many elements in these theories cannot be adequately tested from the available data for Nepal(e.g. opportunity cost of women's time; net wealth flows, etc.). We will concentrate in this study largely on the correlates of fertility and family planning behaviour and see later to what extent they are consistent with the various schools of thought.

The decision to concentrate on family planning aspects was taken mainly for three reasons. Firstly, Nepal has invested a reasonable amount of its national budget in direct programmes to curtail Nepal's high fertility, such as family planning and integrated health programmes. Investments have been made in other indirect programmes, such as agriculture, education, etc. Secondly, Nepal has a long history of population policy which supported family planning. Thirdly, recent family planning prevalence data are available.

Out of 11 intermediate variables, there are only four most important ones which determine the fertility level in most societies: age at marriage, proportion of married women, abortion and contraception. It is known that early and universal marriage promotes high fertility while the prevalence of late marriages and significant proportions never married results in low fertility. As we have noted in Chapter 1, there are different social and cultural values pertaining to marriage in different ethnic groups. Therefore, we include the study of marriage patterns in this thesis.

It is our basic aim to study reasons behind the sustained high levels of fertility in Nepal. To fulfil this objective, it is essential to highlight the demographic and socio-economic context within which family size decisions are made. The proposed conceptual framework which incorporates parts of the theories or frameworks discussed earlier is intended to serve as a basis for studying the parameters of marriage patterns, fertility levels and differentials and the levels and differentials of knowledge and practice of contraception. The proposed framework will be tested empirically in the following analysis and presented in subsequent chapters.

The proposed framework is set out in Figure 2.3; it considers marriage and contraception as the two main intermediate variables which affect the level of fertility. To varying degrees, age at first marriage is determined by demographic background variables such as age of the woman; socio-economic variables- education of the woman and

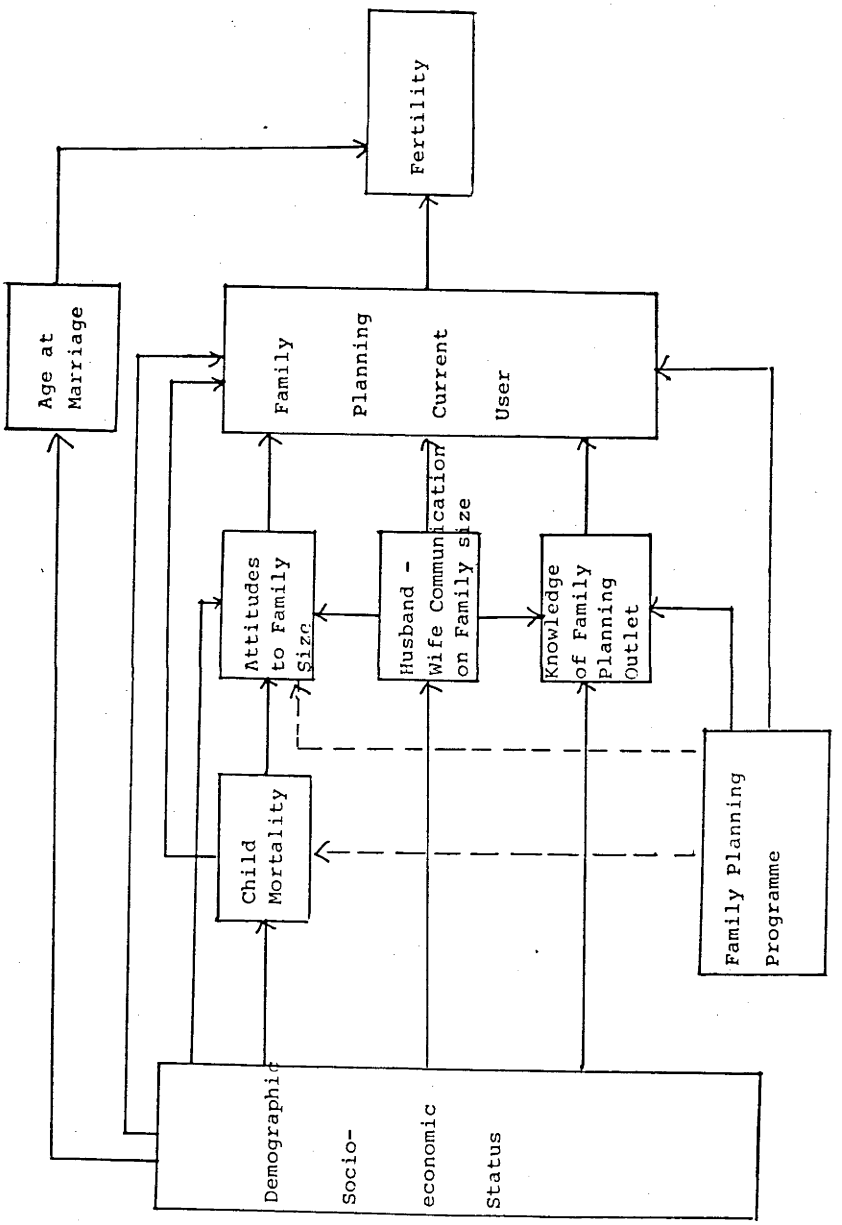

FIGURE 2.3: CONCEPTUAL FRAMEWORK FOR ANALYSIS

her husband, work status of the woman before marriage[1] and work status of her husband; cultural and environmental variables- region of residence (ecological), place of residence, religion and ethnicity.

As can be seen from Figure 2.3, the impact of contraception on fertility will be given considerable importance in this study. In Figure 2.3, it is shown that background variables have an effect on use of contraception directly as well as indirectly through three other intervening variables, namely, attitude toward family size, husband-wife communication on family size and knowledge of family planning outlet. Lines indicate that these three intervening variables also have a direct effect on the use of contraception. A line going from husband-wife communication to attitude toward family size is based on the assumption that husband-wife communication has an indirect effect on the use of contraception through attitude toward family size. Similarly, husband-wife communication has an effect on use of contraception through knowledge of family planning outlet. It is indicated that the family planning programme also determines the level of use of contraception directly as well as indirectly through knowledge of family planning outlet and attitude toward family size. Since the reduction of infant and child mortality is one of the goals of the family planning programme, it is anticipated that the programme's effect on mortality will affect use of contraception through attitude toward family size.

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[1] Except with age at marriage analysis, work status of the women refers to current work.

CHAPTER 3

EVALUATION OF SURVEY DATA

3.1 INTRODUCTION

Two sets of data will be used extensively in this research. The Nepal Fertility Survey, 1976 (NFS) will be used primarily to analyse the marriage and fertility patterns in Nepal (Chapter 4). To some extent, the prevalence of contraceptive use found in this survey will be used in the remaining chapters to compare it with the results of the Nepal Contraceptive Prevalence Survey 1981 (CPS). Chapters 6,7 and 8 which focus on contraception will be based on the Nepal Contraceptive Prevalence Survey, 1981.

The CPS report, 1981(Ministry of Health, 1983:54) estimated that the total marital fertility rate in 1981 was 5.9 which was 13 percent lower than the rate found by the NFS, 1976. However, the report did mention the need to examine a number of issues before concluding that fertility had declined in Nepal. It is a well known fact that various types of response errors may indicate a false decline in fertility. Therefore, survey data cannot be taken at face value. It is essential to bear in mind the type and extent of response errors involved in the data from which conclusions are to be drawn. The aim of this chapter is to assess the quality of data, basing judgment of quality on the following two types of response errors:

1. those that can distort the demographic estimates; and
2. those that can distort the estimated prevalence of contraceptive use.

The extent and types of response error can vary depending on how a

survey was conducted. Hence, the survey methodologies will be presented briefly first.

3.2 SURVEY METHODOLOGY

3.2.1 THE NEPAL FERTILITY SURVEY,1976

The Nepal Fertility Survey (NFS) was carried out during the period April-June 1976 in collaboration with the World Fertility Survey (WFS). The WFS is an international population research programme whose purpose is to assist a large number of interested countries, particularly the developing countries, in carrying out nationally representative, internationally comparable and scientifically designed and conducted surveys of human fertility behaviour. The WFS has three main aims (WFS, no date:5):

1. to assist countries to acquire the scientific information that will permit them to describe and interpret their populations' fertility;

2. to increase national capacities for fertility and other demographic survey research; and

3. to collect and analyse data on fertility which are internationally standardized and, therefore, permit comparisons from one country to another.

The specific objectives of the NFS were as follows(Ministry of Health, 1977:1):

1. to provide data to estimate the level of fertility for the country as a whole and its differentials by major geographic regions (the Hills and the Terai), with some indication of at least the direction for the Mountains as well;

2. to provide data to evaluate progress of the national family planning programme in terms of the levels of knowledge and actual practice of contraception that prevails in the country as a whole and in the major geographical regions, and the extent to which fertility is affected, if at all, by contraceptive use;

3. to provide an opportunity for the local staff to participate in a project of international scope and as a result help build research competence in the Evaluation Division of the Nepal FP/MCH Project[1], which is charged with undertaking research of relevance to the country's family planning programme; and

4. to recruit and train a cadre of front-line fieldworkers, whose skills could be tapped for future data-gathering activities of the Nepal FP/MCH Project and other organizations dealing with problems of development.

A multi-stage cluster sample design was employed in this survey. The rural sample was chosen as a three-stage sample of wards within panchayats[2] within districts. The districts were selected systematically with probability proportional to size (PPS) of the 1971 census population. A two-stage sample design was employed to select the urban sample which was based on the household listing available from a Household Income Survey conducted by the Rastra Bank. A total of 5976 households was selected from the 96 rural and 10 urban sample points. The response rates were 95 percent and 98 percent for household and individual interviews (ever-married women aged between 15 and 49) respectively.

The NFS administered a 49-page Questionnaire adapted from the WFS core Questionnaire. The questionnaire contained seven sections which included a full birth and pregnancy history, background information on the respondent and her spouse, contraceptive knowledge and use and fertility planning. The questionnaire was pre-tested in two districts (one each in the Hills and Plains). During the fieldwork, Nepali, Bhojpuri and Maithali language questionnaires were used to collect information. According to the 1981 census figures, more than

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[1] FP/MCH Project stands for Family Planning and Maternal Child Health Project.

[2] Panchayat is a political unit which may comprise one or more villages.

four-fifths of Nepalese speak one of those languages fluently.

There were 17 teams mostly composed of four interviewers, one field editor and one supervisor. The teams which were assigned to work in the Hills and the Mountains comprised mainly males while those in the Plains were composed largely of females. Out of 80 interviewers, 27 were female. All of these teams were supervised by four senior supervisors on a regular basis and the Survey Director and Resident Advisor on a roving basis. Out of 33 sample districts, 30 were visited during fieldwork by senior officers from the central office. In most instances, visits were not announced in advance to the fieldworkers.

All 17 supervisors had a minimum of Bachelor degree and worked in the Longitudinal Fertility and Family Planning Survey[3] conducted prior to the NFS. They were given a two-week long training course and were involved in the pre-test of the questionnaire. All 80 interviewers, most of whom had worked in the Longitudinal Fertility and Family Planning survey, were given an additional two weeks of training in the two training centres outside the Kathmandu valley.

Every completed questionnaire was checked by the field editor and re-checked by the supervisor on the same day. If any errors were found, the interviewers were sent back to the household for further clarification. Supervisors conducted a 10 percent re-interview of all the household schedules.

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[3] This survey was conducted in the four districts where the Family Planning Project was having a special pilot project. The survey was designed to evaluate the pilot project.

Office editing and coding was carried out by the field supervisors and 20 of the better interviewers. More than 700 different consistency checks were done on a computer at the Central Bureau of Statistics in Kathmandu.

3.2.2 THE NEPAL CONTRACEPTIVE PREVALENCE SURVEY (CPS), 1981

Contraceptive Prevalence Surveys are being carried out in a number of developing countries. The Contraceptive Prevalence Survey was developed in recognition of the need for quick and repeated feedback on the impact of family planning programmes and to assist in the design and evaluation of such programmes (Morris et al., 1981:M-165).

The CPS in Nepal was conducted during the period January-June 1981 with the following objectives (Ministry of Health, 1983:XIX):

1. to provide comprehensive data necessary for planning and evaluating the family planning programmes of Nepal;

2. to involve and train FP/MCH Project staff in all phases of the survey; and

3. to enhance the capability of the Project staff in conducting similar surveys at regular intervals in the future.

As in the NFS, a multi-stage sample design was employed but the sample design was slightly more complicated than in the NFS. The rural sample in the CPS was based on a four-stage sample of households within wards within panchayats within districts. The 33 districts were selected systematically with a probability proportional to the

size of the 1976 mid-term population[4]. In urban areas, a three-stage sample design was employed to select the urban households within wards within town panchayats. The selection of panchayats, wards and households was based on a list prepared for a referendum[5]. The urban sample was oversampled by a factor of five. The total number of ultimate clusters selected was 136 and 42 for the rural and urban areas, respectively. At the end of the survey, a total of 4406 rural and 1476 urban currently married women aged between 15 and 49 were interviewed[6].

The CPS used a 13-page Questionnaire adapted from the questionnaire proposed by the Westinghouse Health Systems[7]. The following information was sought in the Nepalese CPS (Ministry of Health, 1983:26):

- Eligibility and socioeconomic characteristics
- Fertility behaviour
- Future fertility intentions
- Knowledge of contraception

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[4] It was a population sample survey conducted by the Central Bureau of Statistics. Further information is given in chapter 4.

[5] More information is provided later in this chapter.

[6] Although each selection in the rural and urban areas was self-weighting, weights need to be used for the national estimates. Weights are: 1.259 for the rural areas and 0.227 for the urban areas.

[7] The Westinghouse Health Systems operates the CPS at an international level to assist on technical aspects and channels funding supplied by the United States Agency for International Development.

1) Prompted

2) Unprompted

- Current use of contraception
- Past use of contraception
- Side effects of contraception
- Future use of contraception
- Availability of contraception
- Reasons for not using contraception

The questionnaire was pre-tested in two districts (one each in the Hills and the Plains). Results were discussed in a one-day seminar for the purpose of improving the comprehensibility of the questions to respondents, attended by 40 participants drawn from various disciplines, such as demography, anthropology, linguistics and other social sciences. Based on the pre-test and seminar results, the questionnaire was finalized and made available in three major languages, Nepali, Bhojpuri and Maithali.

There were ten teams. Each team was headed by a supervisor. The number of interviewers in each team varied because of the drop-outs of supervisors and interviewers. The ratio of supervisor to interviewers ranged from 1:3 to 1:10. Altogether, there were ten supervisors and 55 interviewers. Out of 55 interviewers, 14 were female, distributed in six teams working in the Plains. Supervision responsibility was also maintained by six senior supervisors. At times the Project Director and Country monitors from the Westinghouse Health Systems also visited a few sample points. Out of 33 sample districts, 18 were visited during the field work by the central staff. Supervisors drew a sample of households in each selected ward before commencing the

actual field work. They scrutinized each completed questionnaire on the same day. If errors were found, the interviewers were sent back to the household to correct the questionnaires. Every supervisor also conducted spot checks and surprise visits.

All ten supervisors had a master's or equivalent degree in economics, or statistics or commerce, but only one had prior experience in survey research. They were given a two-week long training course and involved in a pre-test. Interviewers were recruited from 12 different parts of the country and were given two weeks' training. Interviewers' training was conducted simultaneously in four places outside the Kathmandu Valley.

Office editing of the questionnaire was done by five regular coders of the FP/MCH Project. Coding was carried out by 30 regular staff of the FP/MCH Project. They were all given four days' training. Each coded questionnaire was checked by five of the best coders. Machine editing was carried out in Kathmandu with the use of a computer at the Central Bureau of Statistics.

3.3 RESPONSE ERRORS AFFECTING DEMOGRAPHIC ESTIMATES

The demographic estimates can, generally, be affected by three types of response error. They are:

1. Age misreporting;
2. Omission of births particularly among older women; and
3. Reference errors.

3.3.1 AGE MISREPORTING

It is not uncommon to find misreporting of women's age in single years of age in developing countries. The incorrect reporting of age ends up with a large proportion of women in a particular digit and a small proportion in the neighbouring digits. Ages ending in zero and five tend to have a generally greater concentration of women while ages ending in two and eight tend to have relatively less marked concentrations at the expense of other digits. Such a concentration of women in a particular digit is known as age heaping.

The group of persons reporting, for instance, age 42 consists of (1) persons whose correct age is 42 and (2) those whose correct age is either higher or lower, but who erroneously reported age 42. The latter group is offset partly or wholly by (3) those erroneously reporting 'out of' actual age 42 into older or younger ages. The difference between groups (2) and (3) represents the net misreporting error for age 42. In addition, the count at age 42 is affected by net underenumeration at this age, i.e., by the balance of the number of persons aged 42 completely omitted from the census or survey and the number of persons aged 42 who are erroneously included in the census or survey. This type of error can severely distort any measures or estimation involving the age of respondents (Shryock, et al., 1975:205).

The misreporting of age is one of the common response errors encountered in Nepalese censuses and surveys. Age misreporting in Nepalese censuses has generally been attributed to the low level of literacy in Nepal and incorrect estimation of age by enumerators (CBS, 1977:61). The enumerators in the Nepalese censuses used marital

status and the number of children women have had to estimate the age of the women, causing a net upward transfer from ages 15-19 and 20-24 into age-groups 25-29 and 30-34. Though it looks fairly simple to arrive at a reasonable estimate of ages it can create further problems in data analysis. Ewbank (1981:10) points out:

> If parity and marital status are used to estimate age, then looking at marital status or parity as a function of age involves circular logic and provides no real information about marriage or childbearing.

The transfer of the women's age can affect the age-structure which, in turn, affects the estimation of fertility levels and trends. For example, a group of women whose real ages were 35-39 at the time of interview reported ages 40-44. The effect on the cumulative fertility would be an underestimation because the women aged 40-44 have higher parity than the women aged 35-39. In the case of current fertility, the bias would be in an upward direction as the women aged 40-44 have lower fertility rates than the women aged 35-39. The effect on fertility can occur not only because of the transfer from younger to older ages but also as a result of the transfer from older to younger ages. In this case, the direction of the bias will be in the opposite direction to that caused by transfers from younger to older ages.

Goldman et al.,(1979) conducted a detailed analysis of the quality of the NFS data to determine the extent of response error and its effect on the different demographic measures. The analysis concentrated mainly on misreporting of age and duration; displacement of vital events; and omission of vital events. Based on Goldman et al.'s findings the quality of the NFS data will be discussed.

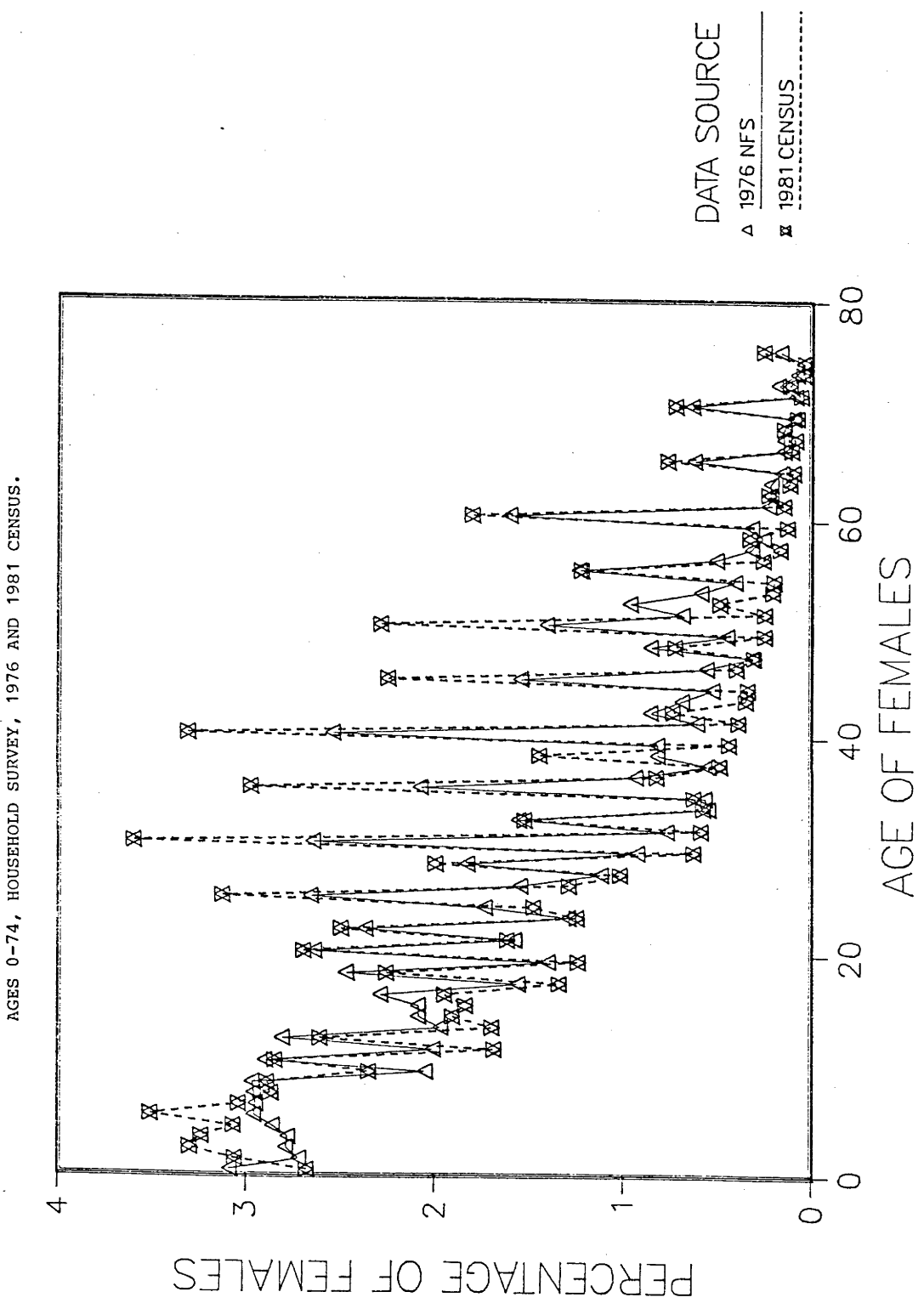


FIGURE 3.1: REPORTED SINGLE-YEAR AGE DISTRIBUTIONS OF FEMALES FOR AGES 0-74, HOUSEHOLD SURVEY, 1976 AND 1981 CENSUS.

Whenever I present comparative results between the NFS and CPS, data will be for currently married women aged between 15 and 59 to make them comparable.

Figure 3.1 shows the percent distribution of female population for ages 0-74 from the Household schedule of the NFS in comparison with the corresponding age distribution from the 1981 census of Nepal. It is quite evident that in both distributions, there is a remarkable preference for some particular digits, i.e. numbers divisible by five and to a lesser degree by two. The pattern of age reporting is quite similar in the census and NFS. The same pattern was observed in the 1971 census (Rajbanshi, et al., 1980:199). Nevertheless, it is clear that the degree of misreporting in terms of age heaping is less in the NFS than in the censuses. Myer's indices calculated for 1971(50.4) and 1981(51.3) indicate that age reporting has not improved over time in Nepalese censuses.

In Figure 3.2, the percent distributions by single years of age of currently married women for ages between 15 and 49 are presented based on the NFS(1976) and the CPS(1981). The patterns of age reporting are remarkably similar, but the degree of age heaping is greater in the CPS data than in the NFS data despite the fact that more women reported their date of birth in the CPS than in the NFS. In the NFS, 13 percent of the respondents (795 out of the 5940 ever-married women) reported a date of birth whereas 20 percent (1168 out of the 5880 currently married women) reported a date of birth in the CPS.

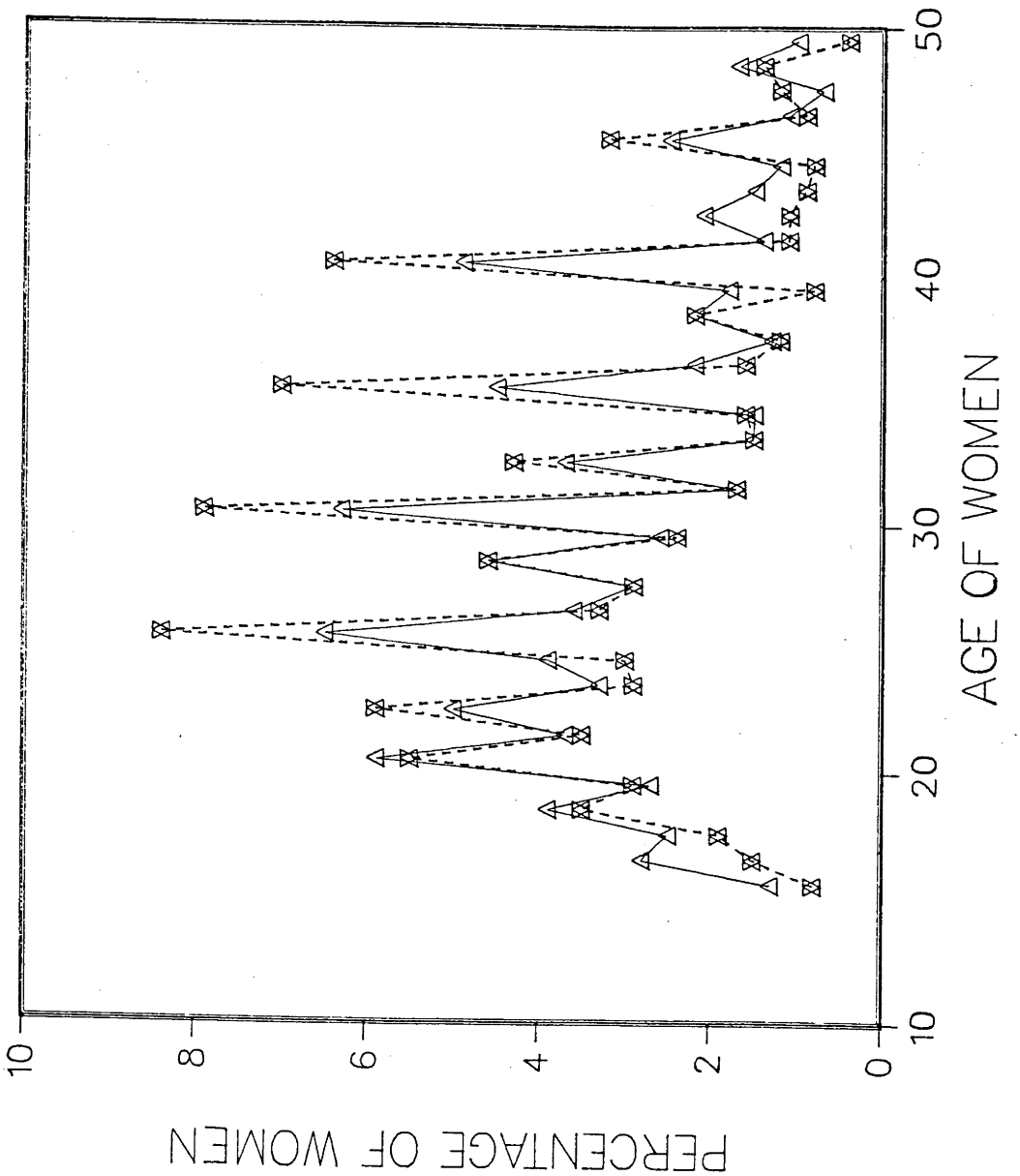
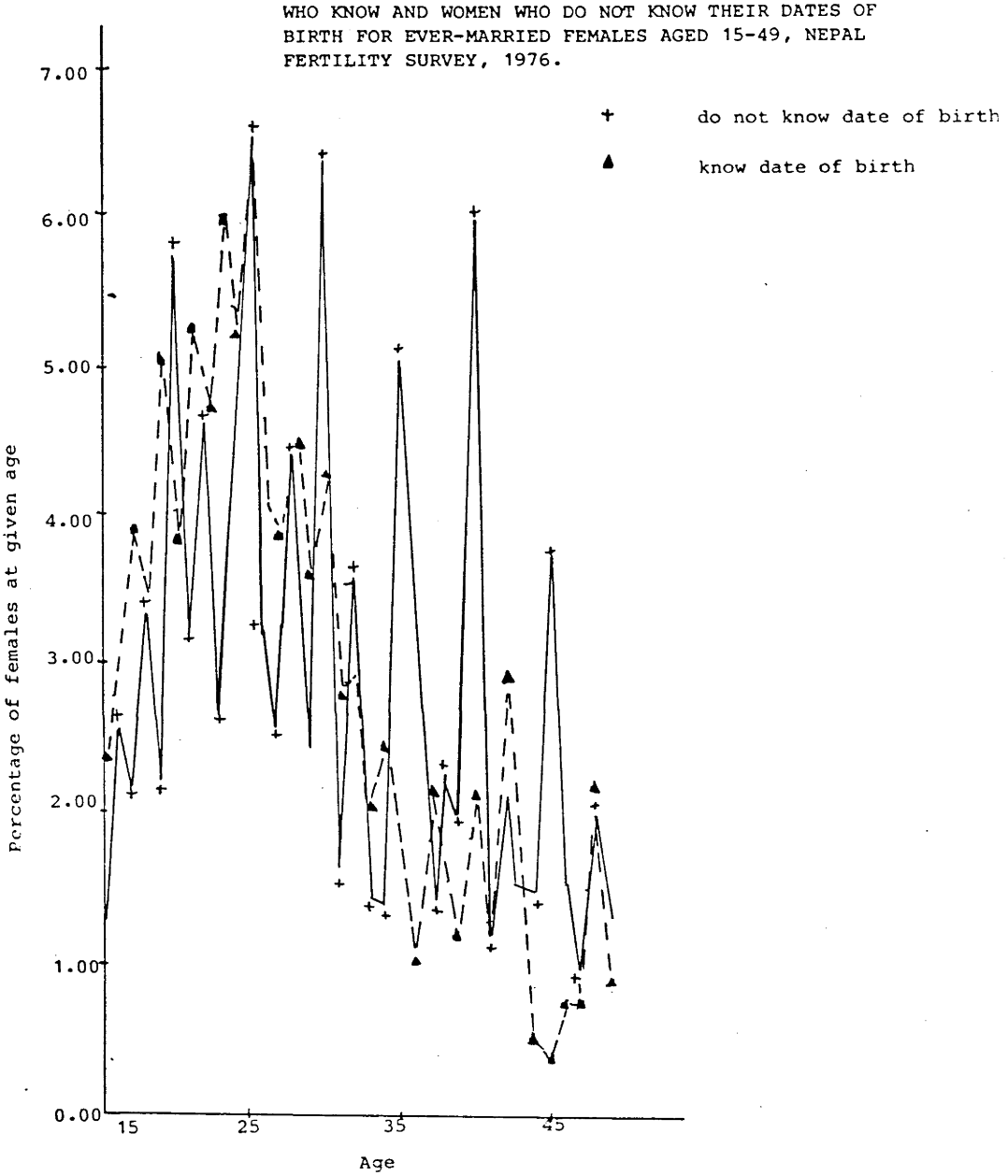


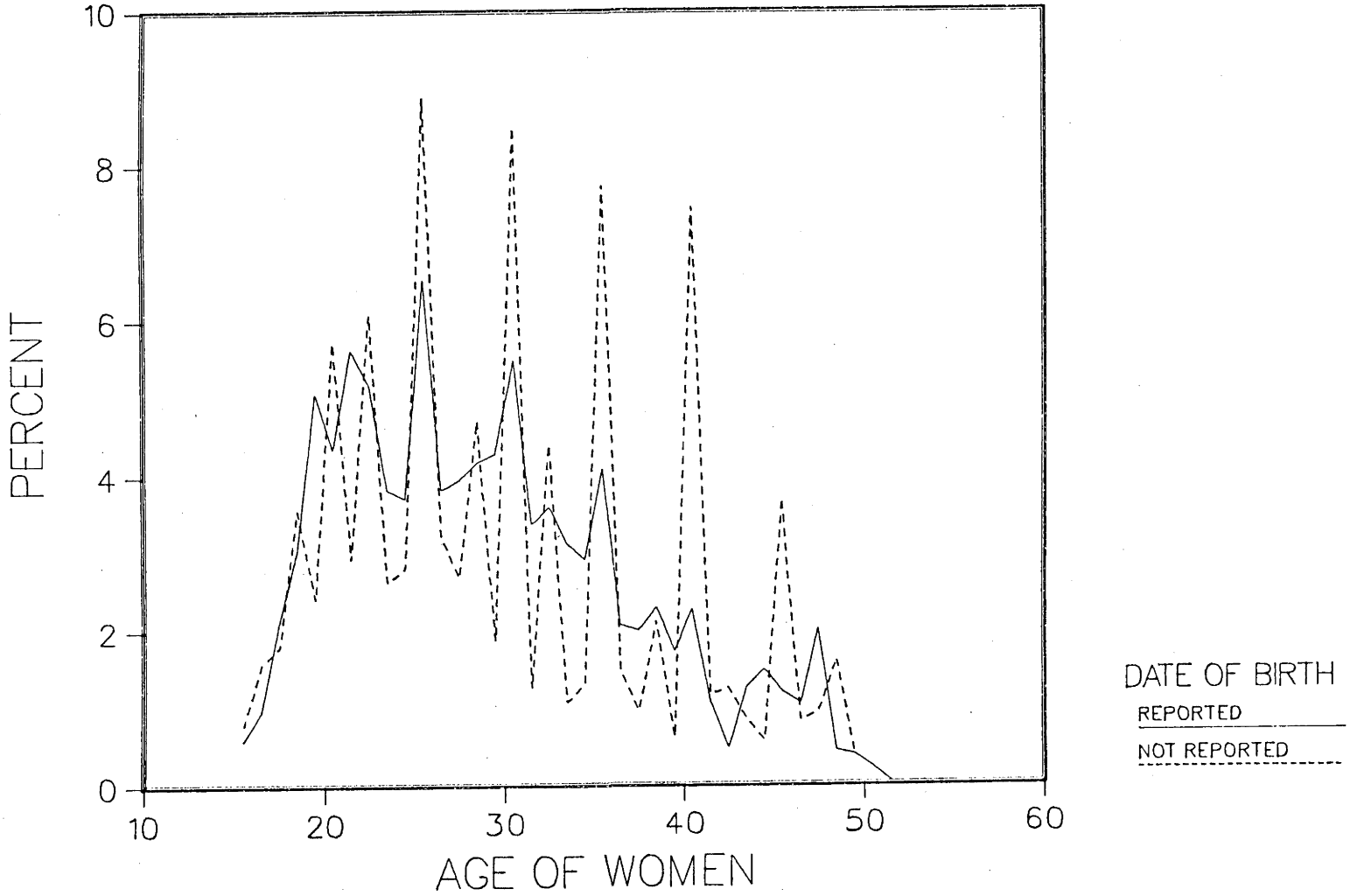
FIGURE 3.2: PERCENTAGE DISTRIBUTION OF CURRENTLY MARRIED WOMEN AGED 15-49 BY SINGLE-YEAR AGE, NEPAL FERTILITY SURVEY (NFS), 1976 AND NEPAL CONTRACEPTIVE PREVALENCE SURVEY (CPS), 1981.

FIGURE 3.3A: REPORTED SINGLE-YEAR AGE DISTRIBUTIONS FOR WOMEN WHO KNOW AND WOMEN WHO DO NOT KNOW THEIR DATES OF BIRTH FOR EVER-MARRIED FEMALES AGED 15-49, NEPAL FERTILITY SURVEY, 1976.



Source: Rajbanshi, B.S., et al., (1980), 'Evaluation of The Quality of The Demographic Data', in POPULATION OF NEPAL, Country Monograph Series No. 6, United Nations, Economic and Social Commission for Asia and the Pacific, Bangkok, p. 200.

FIGURE 3.3B: REPORTED SINGLE-YEAR AGE DISTRIBUTIONS FOR WOMEN WHO KNOW AND WOMEN WHO DO NOT KNOW THEIR DATES OF BIRTH FOR CURRENTLY MARRIED FEMALES AGED 15-49, NEPAL CONTRACEPTIVE PREVALENCE SURVEY (CPS), 1981.



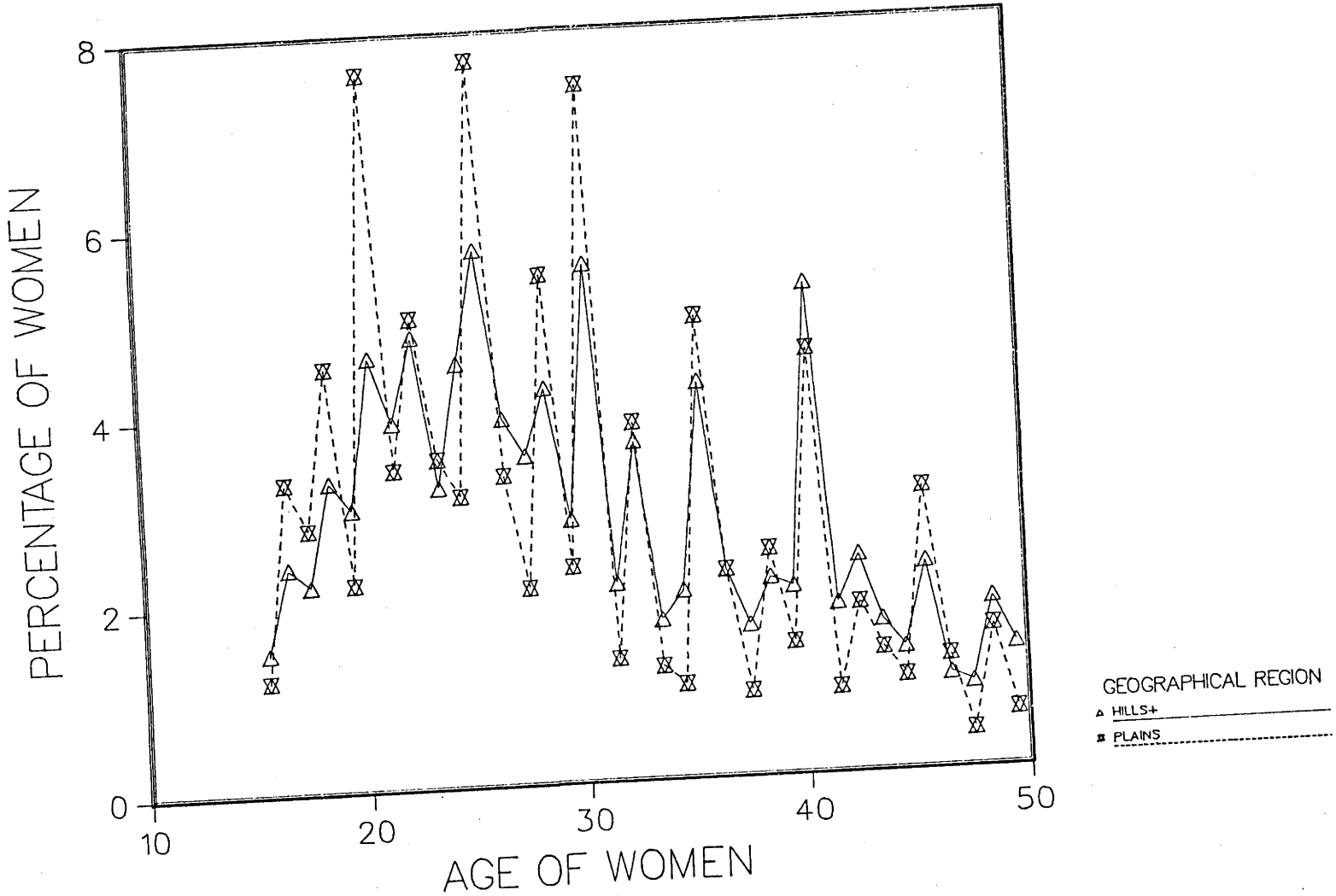
Source: The Nepal Contraceptive Prevalence Survey data, 1981.

Figure 3.3A compares the age distributions of those women who reported a date of birth with those who did not report it in the NFS, 1976. A similar comparison is presented in Figure 3.3B based on data from the CPS, 1981. In both surveys, the age heaping is less pronounced among the women who reported a date of birth than among those who did not. As a result, the age distributions of women who reported a date of birth in 1976 and 1981 are considerably more regular, with less heaping on numbers divisible by two and five. When the age distributions of these two groups of women are compared, the age heaping at certain preferred ages, such as 20 and 25, is more visible in the NFS, 1976 than in the CPS, 1981 among women who reported a date of birth.

The single-year age distribution of currently married women aged 15-49 in the Hills and Mountains is compared with that in the Plains in Figure 3.4A based on the NFS(1976). The similar comparison based on the CPS(1981) is made in Figure 3.4B. The reported age distributions in both surveys exhibit a considerable degree of age heaping at numbers divisible by two and five in all areas. However, the extent of age misreporting is greater in the Plains than in the Hills and Mountains. This finding holds for both sets of data (the CPS and NFS).

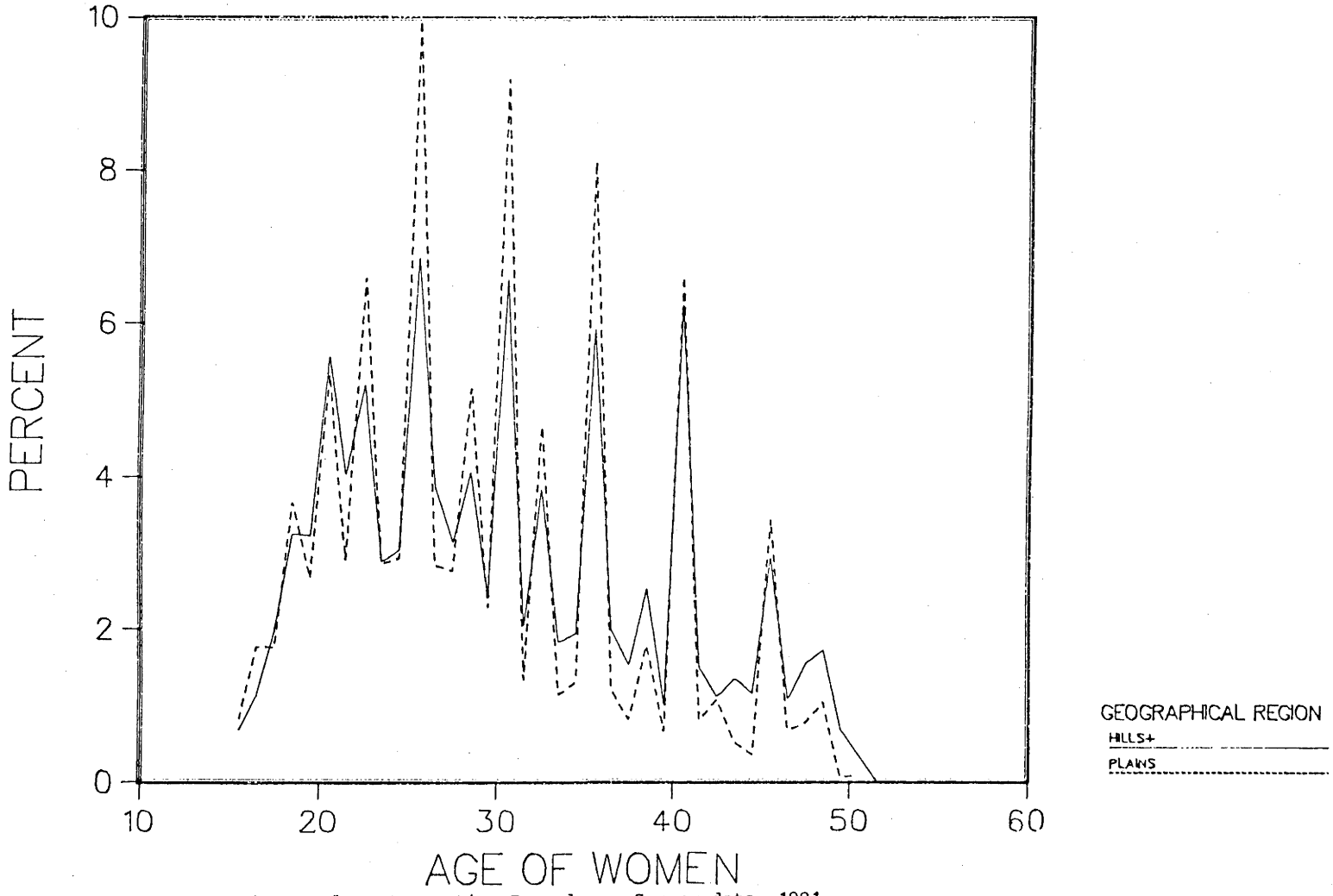
With regard to the literacy of respondents, a considerable degree of age misreporting is clearly visible among illiterate women aged over 30 years from the CPS (1981) data(Figure 3.5). The age heapings at 25 and 30 are almost equal for those who are literate and illiterate. The age distribution of literates shows that there is a large proportion of women reported as 22 years in 1981. This could be

FIGURE 3.4A: REPORTED SINGLE-YEAR AGE DISTRIBUTIONS FOR CURRENTLY MARRIED WOMEN BY GEOGRAPHICAL REGION, NEPAL FERTILITY SURVEY, 1976.



Source: Nepal Fertility Survey data, 1976.

FIGURE 3.4B: REPORTED SINGLE-YEAR AGE DISTRIBUTIONS FOR CURRENTLY MARRIED WOMEN BY GEOGRAPHICAL REGION, NEPAL CONTRACEPTIVE PREVALENCE SURVEY (CPS), 1981.



Source: The Nepal Contraceptive Prevalence Survey data, 1981.

FIGURE 3.5: REPORTED SINGLE-YEAR AGE DISTRIBUTIONS FOR CURRENTLY MARRIED WOMEN BY LITERACY OF WOMAN, NEPAL CONTRACEPTIVE PREVALENCE SURVEY (CPS), 1981.

Source: The Nepal Contraceptive Prevalence Survey data, 1981

intentional false reporting of age rather than unintentional. A year before the CPS was conducted a national referendum on no-party versus multi-party political system was held. The minimum age for Nepalese to be eligible to cast a vote is 21 years. Thus, people, particularly the politically motivated, i.e. the literate group, might have reported themseleves as 21 years old in 1980 (the referendum was held on 2 May 1980) and then reported their age as 22 in 1981 (the survey year).

As we have observed, the extent of age misreporting varied between the two data sets. The variation could be due to several reasons such as variation in sampling errors and the types of probe used in the survey.

In both surveys, all interviewers were trained to use probes to arrive at the correct age of respondents. Interviewers were asked to obtain the age of a woman by relating the time of her birth to some important local event. Instruction was also given to ask the age at marriage and duration of marriage and add the two numbers to arrive at the age of the woman. Likewise, instruction was given to use the age of mother when she gave birth to a particular child. If all this failed, they were asked to request the respondent to guess her own age. If her estimate seemed unbelievable, the interviewer was asked to estimate the age. It is not possible to find out to what extent probes were used to arrive at the age of women in the NFS(1976). In the CPS(1981), all interviewers were required to write an answer to a question: With what probe or question was the age of respondent found?

Table 3.1 presents the percent distribution of currently married women aged 15-49 by the types of question or probe used to estimate the age of respondents in the CPS, 1981. It is evident from the data that only two percent of the woman's ages were obtained using probes, such as important local events, age at marriage and age of child.

TABLE 3.1: PERCENTAGE DISTRIBUTION OF CURRENTLY MARRIED WOMEN AGED 15-49 BY TYPES OF QUESTION USED TO ARRIVE AT AGE OF WOMAN, 1981.

Type of questions used	Number of women	Percent
Date of birth	1124	19.1
Current age	3830	65.1
Important local events	40	0.7
Age at marriage	48	0.8
Age of a child	38	0.6
Respondent's guess	336	5.7
Interviewer's guess	199	3.4
Others	162	2.8
Not clear	99	1.7
No answer	5	0.1
Total	5881	100.0

Source: The Nepal Contraceptive Prevalence Survey data, 1981.

Almost one-tenth of the women's ages were estimated by the respondents or interviewers. Approximately two-thirds of the women reported their ages by answering a question: How old are you? It is very hard to imagine that these women reported age in one single number. It was my personal experience, as the Project Director for both surveys, that many respondents reported age saying 20-21 or 25-26, and so on, instead of giving one single number. As an example, interviewers might have recorded respondents' ages as 20 instead of 21 without probing. Even if they used probes correctly, we would find reported ages based on local events that should be more or less regular, with

less heaping. On the contrary, the age distribution based on local events shows that almost two-thirds (25 out of the 40 women) of the women's ages were concentrated on the preferred digits, such as numbers divisible by two and five (not shown in table). The concentration is more on numbers divisible by five than on numbers divisible by two. As expected, ages guessed by respondents and interviewers heap at numbers divisible by two and five.

It is clear from the above discussion that age heaping resulted from two reasons: (1) no knowledge of date of birth; and (2) only limited use of probes and improper use of probes by interviewers. The second reason is more important because a large number of women did not know their date of birth.

We observed before that the extent of age heaping is slightly more in the CPS(1981) than the NFS(1976). I argue that this is mainly due to differences in emphasis given during the interviewers' training. Though the duration of training for interviewers was two weeks in both surveys, more time was devoted to obtaining accurate demographic information in the NFS, but on obtaining accurate information on contraception in the CPS. This difference was largely due to different objectives in these surveys. In any case, many distortions in single year age distributions cancel each other out when five year age groups are used. The five year age group distributions of currently married women aged 15-49 are quite similar in the NFS and CPS (Table 3.2). There are small differences in the 15-19, 25-29 and 30-34 year age-groups but these very small differences are most plausibly explained by sampling variation and random error in age reporting.

TABLE 3.2: PERCENTAGE DISTRIBUTION OF CURRENTLY MARRIED WOMEN AGED 15-49 BY AGE:NFS,1976 AND CPS, 1981.

	NFS, 1976[1]		CPS, 1981[2]	
Age group	Number of women	Percent	Number of women	Percent
15-19	732	13.2	617	10.5
20-24	1199	21.8	1217	20.7
25-29	1116	20.2	1276	21.7
30-34	807	14.7	996	16.9
35-39	659	12.0	752	12.8
40-44	605	11.1	610	10.4
45-49	383	7.0	413	7.0
Total	5501	100.0	5881	100.0

Notes: Number of women and percentage in each age group may differ from the country reports published because of different version of data tapes.

Source: [1] Tabulated from the Nepal Fertility Survey 1976 data recoded version.
[2] The Nepal Contraceptive Prevalence Survey data, 1981.

The information on age at marriage was sought only in the NFS. The NFS attempted to find the effective age at marriage[8] rather than the age at marriage reported by respondents because many marriages in Nepal were child marriages. About 22 percent of the married couples did not actually start living together at the time of their marriage. For women who reported an age at menarche greater than the age at onset of cohabitation, the latter was increased to be equal to age at menarche. Goldman et al. (1979:13) found that some of the second marriages were also reported as first marriages in the NFS. This

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[8] For women who do not know their date of marriage, they are asked: How many years ago did you get married?

happened because the incidence of second marriage was not asked in the NFS.

According to Goldman et al. (1979:13), the percent distribution of marital duration by single years for ever-married females reveals heaping on preferred digits. It is also confirmed from the data that women who report their age incorrectly tend to report marital durations ending in the digits '0' and '5'.

3.3.2 OMISSION AND MISPLACEMENT OF BIRTHS

The omission of births is another common error encountered in censuses and surveys. The number of children ever born may be understated due to omission of births. Such omissions are often related to the age of respondents. Older women may often forget to report births that occurred in the remote past. This can happen for a number of reasons such as a lapse of memory or a failure to include a child who died or left home. More recent births may also be omitted because of social and cultural beliefs, particularly in a society where prevalence of traditional religion is high.

In Nepalese censuses, omission of children, particularly newly born children, proved to be a common error. It was believed that the following factors were responsible for the under-reporting of children (CBS, 1977:58):

1. A newly born child according to Hindu tradition would be given a name only after nine days[9] of its birth in a religious ceremony. During this period-which may be extended to several months-the child would not be considered as a regular member of the household;

2. During the first one or two years of his life, or more precisely during lactation, a child might be considered of

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[9] The name giving ceremony can occur six months after the birth of the child. It varies from one ethnic group to the another and also depends on the sex of the child.

less significance as a member of the household and generally his name will be dropped out by the head of the household in the interview; and

3. A male child in almost all agrarian societies, (where infant deaths are very frequent), is considered as a valuable asset to his parents and if he survives, is a guarantee for their old age. 'To drive out the evil eye', the mother may not disclose in an interview the right number of male children she has.

The omission of births can create a false impression on the fertility level. Generally, the omission of births which occurred in the remote past will provide an understatement of fertility at early ages in older cohorts. When the omission of recent births is prevalent in the data, it may suggest a false decline in fertility.

A collection of information regarding births which occurred in the recent past also has the serious problem of allocating births to the different time intervals before the survey. In a society where there is no concept of date of an event, reference errors are common. Brass et al.(1968:91) made a comment that the respondents might report events which occurred , on average, in the past eight months or (with a different culture or framing of questions) in the past 15 months as one year. The misplacement of births from one period to another depending on the longer or shorter reference period bias may overestimate or underestimate the period fertility. As a result, it can give a false impression of fertility decline. A complexity of problems occurs when the age of the women is related to the reference errors.

In the NFS, the total number of children ever born was estimated based on separate questions on children of each sex living at home, children living away from home and those who had died. Detailed

information on each pregnancy was also recorded on the pregnancy history. Information gathered from these two sources was reconciled. The total number of children ever born, in the CPS, was estimated in the same way as in the NFS. However, a reconciliation was not possible as there was no pregnancy history collected for each birth. Instead, a short pregnancy history covering live births which occurred five years prior to the survey was used only for those who said that they had live births during that time.

Goldman et al.(1979:22) found that the two curves (reported versus synthetic[10] children ever born) were in good agreement at ages in the early twenties and they concluded that the reference period of a year was perceived approximately correctly by the respondents in the NFS (Figure 3.6A). The two curves depart increasingly from one another with rising age, with exceptional points, such as ages 29,33 and 49. Goldman et al.(1979:24) concluded that women who could not supply a date of birth were more likely to omit births from their fertility histories than were women who reported a date of birth.

Similar curves are shown in Figure 3.6B based on the CPS data. Close agreement between reported and synthetic (but not as close as in Figure 3.6A) is observed up to age 30 years, suggesting that there is a possibility of a reference error in the CPS data. The two curves depart increasingly with rising age, except at ages 42 and 49.

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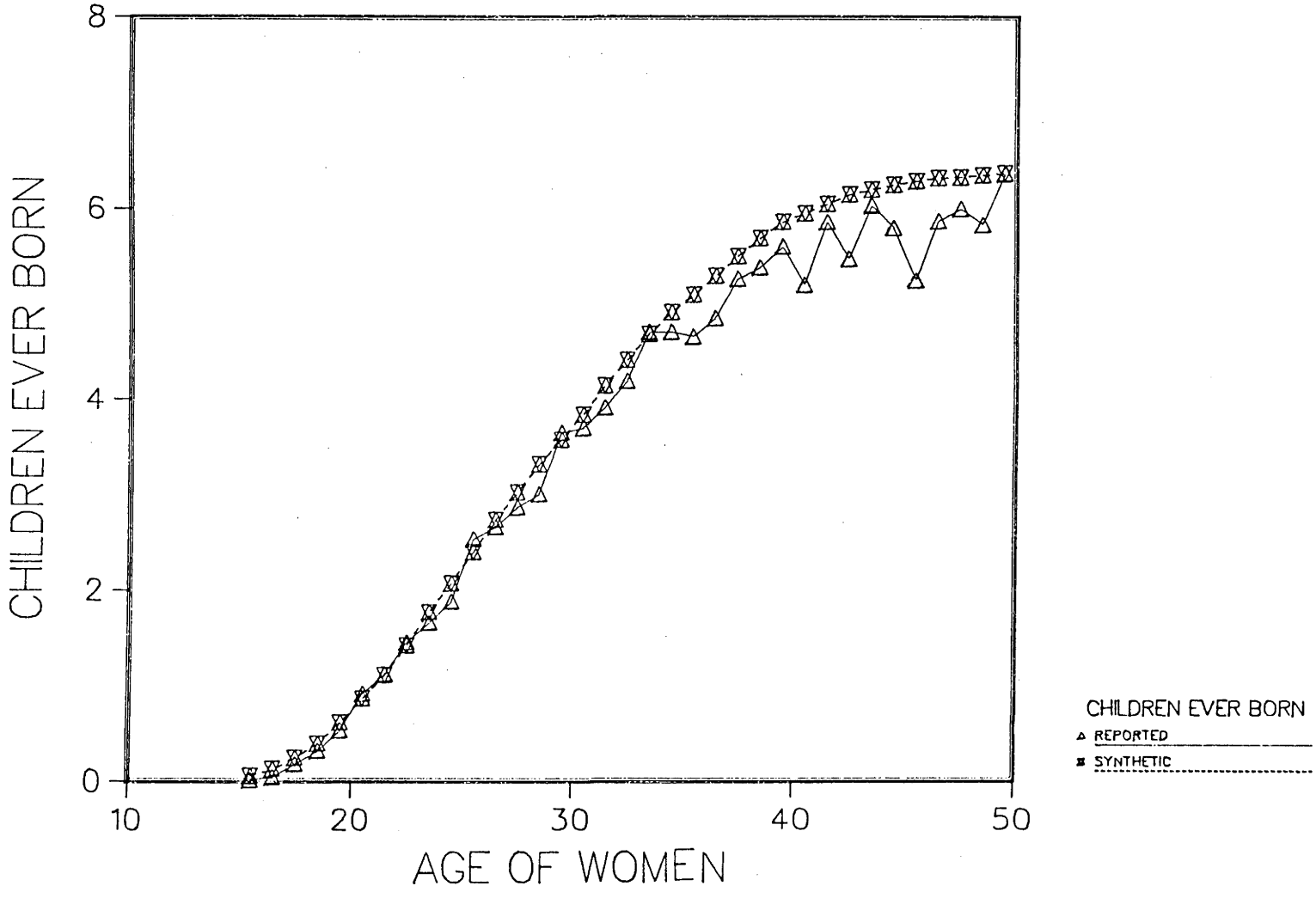
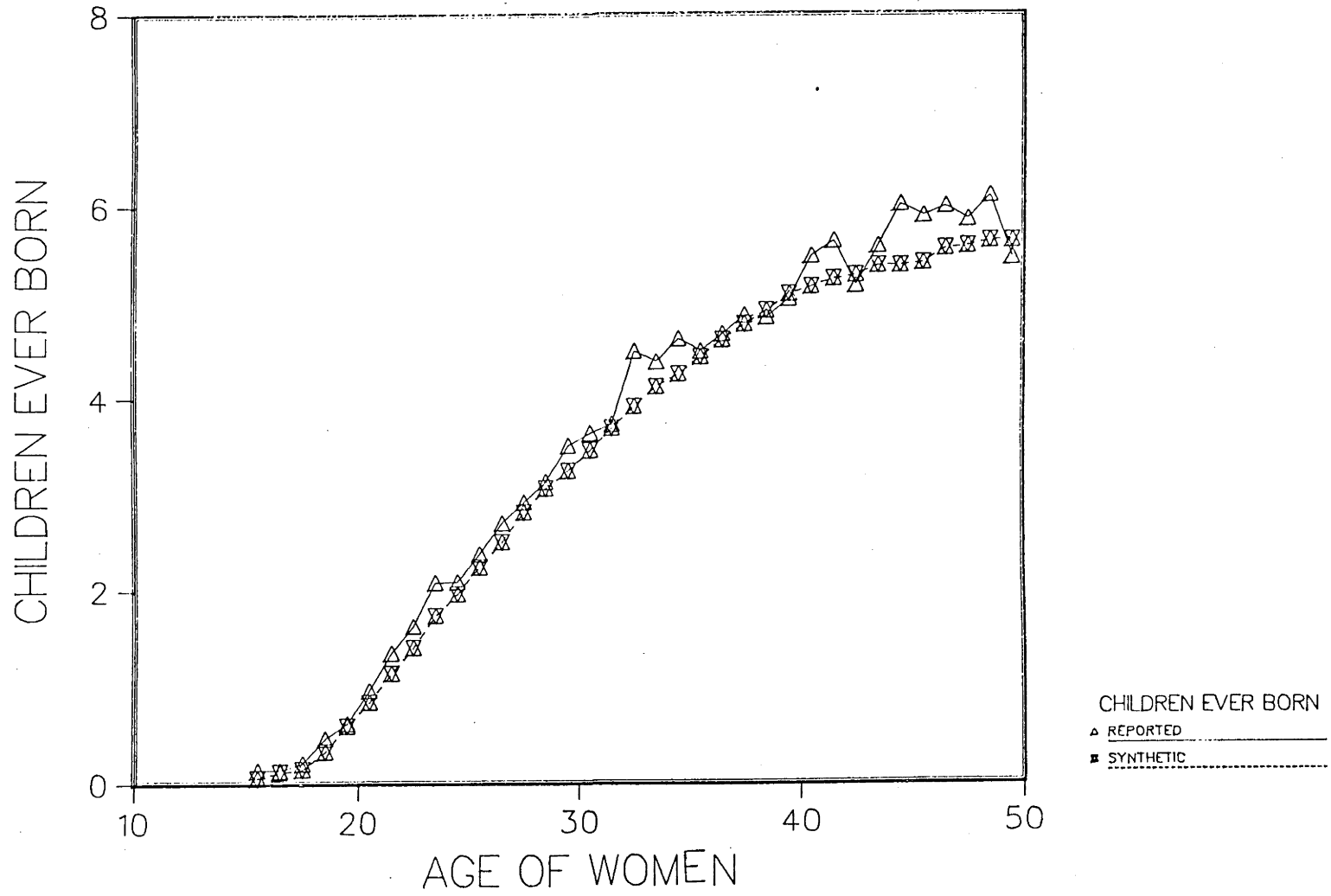
[10] Synthetic number of children ever born is the cumulation of the age specific fertility schedule constructed from births in the past year by single years of age.

FIGURE 3.6A: REPORTED NUMBER OF CHILDREN EVER BORN PER WOMAN AND NUMBER FROM SYNTHETIC BIRTHS, LAST YEAR SCHEDULE, BY SINGLE YEAR OF AGE, NEPAL FERTILITY SURVEY (NFS), 1976.



Source: Table 3.3

FIGURE 3.6B: REPORTED NUMBER OF CHILDREN EVER BORN PER WOMAN AND NUMBER FROM SYNTHETIC BIRTHS, LAST YEAR SCHEDULE, BY SINGLE YEAR OF AGE, NEPAL CONTRACEPTIVE PREVALENCE SURVEY (CPS), 1981.



Source: Table 3.3

The reported children ever born based on the NFS data for single years of age suggest that the average values of reported parity at young ages, particularly at ages 20 and 25, are above the average of the values of the neighbouring two ages(Table 3.3). On the other hand, the reported parities for women above age 30, particularly at ages 35, 40 and 45, are less than the previous groups. The former case is suspected to result from age misreporting while the latter is due to omission of births by women whose age is reported as a heaped number, or, more generally, by women who do not know their ages (Goldman et al.,1979:23).

In the CPS data, the extent of error in the reported children ever born is not greater than in the NFS. Most likely, the problem might be smaller in the CPS than in the NFS. The average values of reported parity at heaped ages, particularly at ages below 30, are approximately the same as average values of the neighbouring two ages, except at ages 18 and 20(Table 3.3). At age 18, the reported parity is higher than the average values of 17 and 19, as a result of age misreporting. For example, some women above age 18 who would normally have more children ever born than 18 year-olds report wrongly to age 18 and some younger women who have had one or more children falsely report age 18. On the other hand, women under age 20 who have a lesser parity than women aged 20 are wrongly reported as 20, as a result, the reported parity at age 20 becomes lower than it really was.

Among older women, the CPS data face the same problem as the NFS data, of omission of births at heaped ages. However, when the reported cumulative fertility by five-year age intervals for women who

TABLE 3.3: REPORTED NUMBER OF CHILDREN EVER BORN PER WOMAN VERSUS NUMBER FROM SYNTHETIC BIRTH-LAST -YEAR SCHEDULE, BY SINGLE YEARS OF AGE, 1976 (EVER-MARRIED WOMEN) AND 1981 (CURRENTLY MARRIED WOMEN).

	NFS, 1976 [1]			CPS, 1981 [2]		
Single years of age	Reported	Synthetic	Difference	Reported	Synthetic	Difference
15	0.01	0.05	0.04	0.14	0.06	-0.08
16	0.04	0.12	0.08	0.14	0.12	-0.02
17	0.17	0.24	0.07	0.21	0.15	-0.06
18	0.31	0.39	0.08	0.46	0.33	-0.13
19	0.53	0.61	0.07	0.62	0.59	-0.03
20	0.91	0.86	-0.05	0.96	0.84	-0.12
21	1.12	1.11	-0.01	1.35	1.14	-0.21
22	1.45	1.42	-0.03	1.63	1.41	-0.22
23	1.66	1.77	0.11	2.09	1.74	-0.35
24	1.88	2.07	0.20	2.10	1.97	-0.13
25	2.53	2.40	-0.13	2.39	2.25	-0.14
26	2.66	2.74	0.09	2.71	2.51	-0.20
27	2.87	3.03	0.16	2.93	2.82	-0.11
28	3.01	3.32	0.31	3.14	3.07	-0.07
29	3.65	3.58	-0.07	3.51	3.25	-0.26
30	3.70	3.84	0.15	3.64	3.46	-0.18
31	3.91	4.14	0.23	3.73	3.69	-0.04
32	4.19	4.41	0.22	4.49	3.91	-0.58
33	4.70	4.68	-0.03	4.38	4.12	-0.26
34	4.70	4.91	0.21	4.62	4.25	-0.37
35	4.65	5.09	0.44	4.49	4.43	-0.06
36	4.86	5.29	0.43	4.67	4.61	-0.06
37	5.26	5.50	0.24	4.86	4.77	-0.09
38	5.38	5.69	0.31	4.84	4.91	-0.07
39	5.60	5.86	0.26	5.03	5.08	-0.05
40	5.20	5.95	0.75	5.48	5.16	-0.32
41	5.86	6.05	0.20	5.64	5.24	-0.40
42	5.47	6.15	0.68	5.17	5.28	-0.11
43	6.03	6.20	0.17	5.59	5.38	-0.21
44	5.80	6.25	0.46	6.02	5.38	-0.64
45	5.25	6.29	1.04	5.90	5.41	-0.49
46	5.87	6.32	0.45	6.00	5.56	-0.44
47	6.00	6.33	0.34	5.86	5.58	-0.28
48	5.83	6.35	0.52	6.11	5.64	-0.47
49	6.36	6.37	0.01	5.46	5.64	-0.18

Sources: [1] Goldman et al. (1979), 'The quality of data in the Nepal Fertility Survey', Scientific Reports, no. 6, December, ISI/WFS, London.
[2] The Nepal Contraceptive Prevalence Survey data, 1981.

Note: Numbers may disagree in last decimal place due to round-off error.
Definition of synthetic children ever born is given in the text.

reported their date of birth is compared with that for women who did not know their date of birth, these two groups have almost the same fertility, with the exception of the 15-19 age-group(Table 3.4). This suggests that the past fertility has been reported in the CPS by women who did not know their date of birth as correctly as by those who did know the date.

The major difference between the NFS data and the CPS data is that the number of 'synthetic' children ever born is, at most ages, higher than the 'reported' in the NFS data while the 'reported' is higher than the 'synthetic', at all ages, in the CPS data. The difference in these two curves can occur if the fertility is actually declining. I argue that the differences found in the CPS are due to omission.

The P/F ratio[11] which was developed by Brass is one of the most frequently used indirect techniques for the estimation of current fertility in the developing countries. This procedure has also been extensively used as a diagnostic tool in the evaluation of the quality of survey data in Nepal (Hobcraft et al.,1982:291). If fertility has been constant, reference error is the same for all ages in recent periods and the P/F ratios are greater than one and decline gradually with increasing age; this suggests that there is a reference error as well as omission of births, particularly at older ages (Brass, 1980:37). The P/F ratio technique was applied to the NFS data by Goldman et al., who found that there was no misperceived reference

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[11] P refers to children ever born per woman and F refers to cumulative births in the recent period.

TABLE 3.4: REPORTED NUMBER OF CHILDREN EVER BORN PER WOMAN BY AGE AT SURVEY, FOR WOMEN WHO REPORT VERSUS WOMEN WHO DO NOT REPORT DATES OF BIRTH FROM THE NFS (1976) DATA AND THE CPS (1981) DATA.

	NFS, 1976[1]				CPS, 1981[2]			
	Date of birth				Date of birth			
	Not reported		Reported		Not reported		Reported	
Age at survey	Children ever born	Number of women	Children ever born	Number of women	Children ever born	Number of women	Children ever born	Number of women
15-19	0.31	603	0.38	141	0.36	476	0.49	138
20-24	1.41	1028	1.61	199	1.55	950	1.54	265
25-29	2.90	965	2.93	177	2.78	1009	2.86	267
30-34	4.11	740	4.06	115	4.05	780	3.92	216
35-39	5.02	677	5.59	59	4.62	609	4.70	142
40-44	5.52	651	5.65	69	5.53	532	5.41	77
45-49	5.70	481	6.29	35	5.97	351	5.83	62

Notes: 'Women' refers to ever-married women in the NFS (1976) while it refers to currently married women in the CPS (1981).

Sources: [1] Goldman *et al.* (1979), 'The quality of data in the Nepal Fertility Survey', Scientific Reports, no. 6, December, table 8, ISI/WFS.
[2] The Nepal Contraceptive Prevalence Survey data, 1981.

period. Thus, there was no need for an adjustment for estimating current fertility with the use of births in the past year(Goldman et al.,1979:21). The P/F ratio was also calculated by motherhood duration using the NFS data. The values suggested that the reporting of births was good in most recent periods and fertility was constant(Hobcraft et al.,1982:312).

The P/F ratio procedure was also applied to the CPS data; the result is presented in appendix 4.1. The P/F ratio presented for each age-group indicates that the ratios are higher than unity at younger ages and decline gradually with increasing age. The P/F ratio for the age-group 20-24 suggests that births have been 28 percent underreported for the past year in the CPS and the declining values indicate omission of births by older women. The latter finding cannot be certain from the parity based on the five-year age-groups but it is clearly identifiable from the single years of age of the women (Table 3.3). The application of the P/F ratio technique suggests that recent births are underreported. Thus, age-specific fertility rates by five-year age intervals require a correction factor of 28 percent. An application of the correction factor would indicate that fertility had remained constant in Nepal.

I have already pointed out that there are a number of reasons why the children born recently can be underreported. In addition, the underreporting of recent births occurred in the CPS because the question was asked wrongly. A short pregnancy history was used only for those women who said 'yes' to a question: In the past five years did you have any live births? Brass argues that the question asking date of last birth is better(1975:16). He writes:

> Results are better, because, when one asks 'When did you have your last child?', some kind of definite and certain answer to the question is almost mandatory. On the other hand, the question 'Did you have a child last year?' almost invites a 'no' response.

My concern in the present study is not the 'last year' or the 'last five years' rather it is 'When did you?' or 'Did you?'. The latter form of question can easily fail to collect the correct number of children born recently for the three reasons stated above. In addition, children who have died will not be reported because parents do not want to remember those events. Recent death events are more sensitive than earlier death events. It has been documented in other Nepalese surveys that deaths, particularly infant deaths, are underreported(Nepal FP/MCH, 1977:219; and Thapa et al., 1982:64-65).

3.4 RESPONSE ERRORS RELATING TO CONTRACEPTION

Almost all of the sample surveys which collected information regarding knowledge and practice of contraception were not accompanied by evaluation of their reliability, indicating that the survey planners ignored the importance of response error. The lack of knowledge on reliability of these data raises doubts. As Mauldin(1965:98) argues, '.....in the sensitive area of fertility behavior, will people tell about their behavior, and will they tell the truth? How useful are such surveys?'. Hauser(1967:403) pointed out that KAP Surveys neglected to include adequate efforts to study the reliability and validity of their data. Hauser added that these surveys ignored the literature on response errors.

In the sixties and seventies, a few researchers attempted to assess the quality of their data in terms of reliability and validity. Some of the most notable were Westoff, Potter and Sagi(1961:52-69), Freedman and Takeshita(1969:405), Brackbill(1974: 261-266), Mukherjee(1975:127-142), Knodel and Piampiti(1977:55-66), Coombs(1977:218-232) and Ryder(1979:115-128). The Indonesia Fertility Survey which was carried out in cooperation with the WFS was accompained by a reliability survey which, however, did not include contraception aspects(MacDonald et al.,1978). Under the WFS programme, the Response Errors Project conducted a study to (1) provide guidance to users of substantive data; (2) provide the basis of improved survey design; and (3) satisfy methodological research objectives (O'Muircheartaigh,1982). The study was designed to be carried out in three stages: main interview, re-interview and reconciliation interview and was conducted in Lesotho, Peru, Turkey and the Dominican Republic. The report is yet to come out.

The response reliability studies mentioned above were based on the test-retest design. This type of study has several drawbacks. Knodel et al.(1977:55) noted that the long period between interviews increased the chances of genuine change occurring in attitudes and in some behavioural characteristics, such as contraceptive use. It may also increase the chances of sample loss due to death or migration. When there is a very short interval between interviews, the respondents may refuse to co-operate. Another problem is the error that occurs in recording, editing, coding, punching and matching records from each round, and also from interviewer bias.

In short, the finding of these studies was that there was greater reliability for factual data than for data relating to knowledge of contraceptive methods. Mukherjee(1975:140) concluded, based on his findings, that unreliability of responses to attitudinal questions was not due to (1) complex and ambiguous items, (2) inconsistent items, (3) mechanical errors in reading, marking and scoring, (4) inadequate and non-uniform instructions, and (5) changes in attitudes. The possible reasons suggested were situational factors, particularly (1) the effect of the interviewer, (2) the presence of other people at the interview, (3) the nature and wording of the questions asked, (4) the degree of rapport established before the interview, (5) the willingness on the part of the interviwee to continue the interview, and (6) response according to perception of the interviewer's attitude and views.

A group of anthropologists conducted a survey[12] a few months after the NFS. The authors concluded, based on their study, that the knowledge of contraception was grossly underreported. They argued that the underreporting was due to linguistic unintelligibility, i.e. the language used in the NFS was primarily a highly literate variety, and to the circumstances of the interview: a stranger (interviewer) asking sensitive questions in the presence of the respondents' kinsmen

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[12] Their primary aim was to cross-check the validity and accuracy of survey research results. A questionnaire was compiled that consisted of questions from four different major Nepalese Surveys, i.e. surveys on household economics, health and family planning. They were administered to 76 people in three different villages with which authors were very familiar. Cross-checking was carried out with in depth interview and based on authors' past knowledge on particular individuals. Tests of the intelligibility of sample questions and vocabulary items were conducted among 64 respondents.

and neighbours (Campbell et al.,1979:8).

In the CPS, every effort was made to improve the language of questions by conducting a pre-test and a language seminar attended by linguists. Interviewers were drawn from various places in the country so that there would be at least one local person in a team.

In the following analysis, the CPS(1981) information concerning the knowledge and use of family planning methods will be assessed based on the effects of situational variables. More specifically, level of knowledge and use of contraception will be compared by the sex of interviewers, the extent of reliability and degree of co-operativeness as seen by interviewers, and presence of other persons during the interview.

3.4.1 RESPONSE RELIABILITY

Every interviewer was asked to scale the overall co-operativeness shown by respondents during the interview. Interviewers were also asked to give their opinion concerning the reliability of the respondent's responses with respect to knowledge and use of contraception. Scales run from one to nine. One indicates that a response is unreliable or the respondent is unco-operative, nine indicates that a response is reliable or the respondent is co-operative during the interview. I imagine that the level of co-operativeness or reliability as seen by individual interviewers may also be subject to a chance effect. More specifically, interviewers may mark three instead of four or vice versa without it meaning any real difference. If we try to differentiate reliability level between three or four, we may not get meaningful information. However, the

broad scale will give some meaningful information. Thus, I will discuss my findings based on two broad categories i.e. below average (one to four) and above average (five to nine).

Table 3.5 indicates that more than four-fifths of the respondents are above average in the overall co-operativeness scale in all three geographical regions. However, there are six percent more respondents in the Hills categorized within 'above average' in the overall co-operativeness scale than in the other regions. It is hypothesized

TABLE 3.5: PERCENTAGE DISTRIBUTION OF RESPONDENTS BY THE LEVEL OF OVERALL CO-OPERATIVENESS DURING INTERVIEW AND GEOGRAPHICAL REGION, 1981.

Level of overall co-operativeness		Geographical region			
		Mountains	Hills	Plains	All
Unco-operative	1	0.0	0.8	0.9	0.8
	2	3.5	1.4	1.9	1.8
	3	3.3	1.1	4.1	2.8
	4	4.6	2.6	5.2	4.1
	5	8.1	4.7	7.2	6.2
	6	11.6	12.3	13.0	12.6
	7	20.5	22.0	17.9	19.8
	8	17.0	27.5	18.5	22.2
Co-operative	9	31.4	27.6	31.4	29.8
Total		100.0	100.0	100.0	100.0
Mean		7.1	7.4	7.1	7.2
Number of respondents		458	2438	2885	5781

Notes: Percentages may not add up to 100, because of rounding and 100 cases were excluded from analysis because of no response.

Source: The Nepal Contraceptive Prevalence Survey data, 1981.

that women respondents tend to be more friendly and less hesitant to talk about a personal matter such as family planning with the female interviewer than with the male interviewer. This is more true in the

Plains than in the Hills because the Hill women are more open and friendly to outsiders than their counterparts in the Plains. This hypothesis is explored in Table 3.6, which shows that 94 percent of respondents are categorized as 'above average' in the co-operativeness scale by the female interviewers while only 86 percent are so

TABLE 3.6: PERCENTAGE DISTRIBUTION OF RESPONDENTS FROM THE PLAINS BY THE LEVEL OF OVERALL CO-OPERATIVENESS DURING INTERVIEW AND SEX OF INTERVIEWER, 1981.

Level of overall co-operativeness		Sex of interviewer: Male	Female	Total
Unco-operative	1	1.0	0.8	0.9
	2	2.5	0.5	1.9
	3	5.0	1.7	4.1
	4	5.9	3.3	5.2
	5	7.8	5.6	7.2
	6	13.1	12.6	13.0
	7	13.4	28.9	17.9
	8	17.9	20.0	18.5
Co-operative	9	33.3	26.7	31.4
Total		100.0	100.0	100.0
Number of respondents		2043	840	2883

Notes: Percentages may not add up to 100 because of rounding and 62 cases were excluded from analysis because of no response.

Source: The Nepal Contraceptive Prevalence Survey data, 1981.

categorized by the male interviewers in the Plains[13]. Though the hypothesis that more women tend to be co-operative to the female interviewer than to the male interviewer appears to be continued, the overall effect is expected to be very small as a large majority of the

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[13] The effect of the interviewer's sex can be tested only in the Plains because male and female interviewers were sent to the same places in the Plains whereas female interviewers were not sent to the remote villages in the Hills and Mountains.

respondents were cooperative to both types of interviewers in all regions of Nepal.

According to the interviewers' rating of response reliability with respect to knowledge, ever-use and current use of contraception, approximately three-fourths of the responses are rated 'above average' on the reliability scale. Responses given by the women from the Mountains and the Hills are more reliable than the responses of the women from the Plains. This is true not only of 'prompted knowledge' regarding contraception but also of 'ever use' and 'current use' of contraception (Table 3.7). Among many other factors, the true response may not come for two reasons: the interviewer's sex and person(s) present during the interview.

3.4.2 RESPONSE EFFECTS

Table 3.8 presents the proportion of women with knowledge of contraception by specific method and sex of interviewer in the Plains. Data show that the level of knowledge of specifc methods is consistently higher among women who were interviewed by female interviewers than those interviewed by men[14]. The effect of the sex of the interviewer is also apparent when the knowledge on any method of contraception is considered[15].

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[14] The association between sex of interviewer and knowledge of specific methods except with IUD is significant at the one percent level.

[15] The association is significant at the one percent level.

TABLE 3.7: PERCENTAGE DISTRIBUTION OF RESPONDENTS BY RESPONSE RELIABILITY WITH PARTICULAR QUESTIONS ON KNOWLEDGE, EVER USE AND CURRENT USE OF CONTRACEPTION BY GEOGRAPHICAL REGION, 1981.

Related question and geographical region	Response reliability: unreliable 1	2	3	4	5	6	7	8	reliable 9	Total	No. of respondents	Below average (1-4)	Above average (5-9)
Prompted knowledge													
Mountains	0.0	3.8	7.1	9.8	9.6	13.1	23.5	16.9	16.1	100.0	461	20.7	79.2
Hills	1.0	2.0	3.9	6.5	8.1	16.3	23.3	19.1	20.0	100.0	2373	13.4	86.6
Plains	5.7	9.4	9.8	10.5	9.1	10.2	12.0	10.4	22.9	100.0	2901	35.4	64.6
All	3.3	5.8	7.2	8.8	8.7	13.0	17.6	14.8	20.8	100.0	5735	25.1	74.9
Ever use													
Mountains	0.0	1.1	4.3	15.1	9.7	8.6	24.7	15.1	21.4	100.0	93	20.5	79.5
Hills	1.0	2.7	2.3	3.2	6.7	11.9	18.7	25.6	27.9	100.0	975	9.2	90.8
Plains	21.0	6.0	6.9	5.9	5.7	8.1	10.6	13.5	22.3	100.0	1963	39.8	60.2
All	14.0	4.8	5.3	5.3	6.1	9.3	13.6	17.4	24.2	100.0	3031	29.4	70.6
Current use													
Mountains	4.0	0.0	12.1	4.0	3.0	9.1	18.2	45.6	4.0	100.0	33	20.1	79.9
Hills	2.4	3.3	4.1	6.5	5.9	7.4	13.0	19.2	38.2	100.0	339	16.3	83.7
Plains	20.4	4.0	1.8	4.2	4.4	8.0	10.1	13.3	33.8	100.0	930	30.4	69.6
All	15.3	3.7	2.6	4.8	4.8	7.8	11.1	15.7	34.2	100.0	1302	26.4	73.6

Source: The Nepal Contraceptive Prevalence Survey data, 1981.

The effect of person(s) present during the interview on the level of knowledge of specific methods is presented in Table 3.9A. The first panel represents the Mountains and Hills. The second panel represents the Plains. In the Mountains and Hills, the presence of husband and in-law(s) during the interview seems to lead to an upward bias while the presence of other female(s), and other male(s) results in a downward bias. Nevertheless, the differences in the proportions

TABLE 3.8: PERCENT OF RESPONDENTS WITH KNOWLEDGE OF CONTRACEPTION BY SPECIFIC METHOD AND SEX OF INTERVIEWER: PLAINS, 1981

Specific method	Sex of interviewer: Male N	Male Percent	Female N	Female Percent	All N	All Percent
Oral pills*	328	6.7	357	36.2	685	23.2
Condom*	194	9.9	136	13.8	330	11.2
IUD	164	8.4	108	11.0	272	9.2
Female sterilization*	1021	52.1	756	76.7	1777	60.3
Male sterilization*	734	37.4	602	61.1	1336	45.4
Depo-provera*	167	8.6	148	15.0	315	10.7
Traditional	53	2.7	25	2.5	78	2.6
Others	4	0.2	9	0.9	13	0.4
At least one	1961	55.1	985	80.3	2946	63.5

Notes: * indicates difference in percentages between male and female significant at one percent level.
N denotes number of respondents.

Source: The Nepal Contraceptive Prevalence Survey data, 1981.

are significant at the one percent level only when the husband is present, particularly with respect to knowledge of oral pills, condom, IUD, male sterilization and depo-provera. The differences in proportions between the other person(s) present and not present

TABLE 3.9A: PERCENT OF RESPONDENTS WITH KNOWLEDGE OF CONTRACEPTION BY SPECIFIC METHOD, WHETHER PARTICULAR PERSON(S) PRESENT DURING INTERVIEW AND GEOGRAPHICAL REGION, 1981.

	Particular person(s) present							
	Husband		In-law(s)		Other female		Other male	
Geographical region	No	Yes	No	Yes	No	Yes	No	Yes
Mountains and Hills								
Oral pills	24.8	33.9*	27.0	27.5	27.3	25.9	27.8	17.3*
Condom	14.5	20.5*	15.6	21.3	15.7	16.7	16.4	10.1
IUD	6.4	11.1	7.3	11.0	7.2	8.9	7.7	5.9
Female sterilization	27.4	31.2	28.1	32.4	28.9	25.9	29.2	17.8*
Male sterilization	28.8	37.0*	30.5	35.6	31.1	29.5	31.6	19.9*
Depo-provera	6.1	10.6*	7.0	10.9	7.1	7.7	7.2	7.5
Traditional	(0.3)	(0.6)	(0.4)	(0.0	(0.2)	(0.8)	(0.3)	(0.8)
Others	(0.3)	(0.6)	(0.4)	(0.0)	(0.3)	(0.6)	(0.3)	(0.7)
Plains								
Oral pills	23.5	23.0	23.8	19.9	22.1	25.3	23.1	24.6
Condom	11.7	9.8	11.8	6.9*	12.3	9.6	12.0	6.3*
IUD	9.6	8.1	9.8	4.6*	10.2	7.7	9.9	4.6*
Female sterilization	61.1	57.9	60.3	60.4	54.3	70.1*	60.2	61.2
Male sterilization	45.4	46.1	45.7	44.4	41.0	53.0*	45.3	47.7
Depo-provera	11.2	9.3	11.2	7.1	11.1	10.1	11.0	8.7
Traditional	(2.6)	(2.7)	(2.8)	(0.7)	(3.1)	(1.7)	(2.1)	(5.6)*
Others	(0.4)	(0.5)	(0.3)	(0.8)	(0.6)	(0.1)	(0.5)	(0.1)

Notes: (1) Percentage within parentheses indicates that denominator is less than 25 but more than 10.
(2) * indicates difference in percentages between male and female or present and not present significant at 1 percent level.

Source: The Nepal Contraceptive Prevalence Survey data, 1981.

with knowledge of oral pills, male and female sterilization are significant at the one percent level.

TABLE 3.9B: PERCENT OF RESPONDENTS WITH KNOWLEDGE OF ANY PARTICULAR METHOD OF CONTRACEPTION BY WHETHER PERSON(S) PRESENT DURING INTERVIEW AND GEOGRAPHICAL REGION, 1981.

	Mountains and Hills		Plains	
Person(s) present during interview	Number of women	Percent with knowledge	Number of women	Percent with knowledge
Husband				
No	2217	38.7*	2195	64.5
Yes	691	44.7	700	60.5
In-law(s)				
No	2751	39.8	2553	63.8
Yes	158	45.3	343	61.5
Other female(s)				
No	2350	40.9	1790	58.0*
Yes	559	37.0	1106	72.5
Other male(s)				
No	2693	41.4*	2512	63.2
Yes	216	24.0	384	65.6

Notes: * indicates difference in percentages between male and female significant at one percent level.

Source: The Nepal Contraceptive Prevalence Survey data, 1981.

In the Plains the presence of the other person(s) seems to exert a downward bias on the knowledge of specific methods, with the exception of oral pills, male and female sterilization when other female(s) and other male(s) are present. However, the differences in the proportions of women with knowledge of condoms and IUD between the in-law(s) and other male(s) present and not present are significant at

the one percent level. Unlike the women from the Hills, the presence of husband has no significant effect on women's knowledge of a specific method.

When the knowledge on any method of contraception is considered, the significant associations are found between (1) proportion of women with knowledge and presence of husband, and (2) proportion of women with knowledge and presence of other male(s) in the Mountains and Hills (Table 3.9B). With respect to the Plains, a significant association is found only between knowledge of contraception and presence of other female(s). The interesting patterns of association are : the proportion of women with knowledge of contraception is higher in the Mountains and the Hills when interviewed in the presence of close relatives, i.e. husband and in-law(s). The proportion is lower when interviewed in the presence of 'other female(s) and 'other male(s)'. The patterns of association are opposite in the Plains.

With regard to ever use and current use of contraception[16], the sex of the interviewer has no significant effect (Tables 3.10 and 3.11). The presence of husband during the interview has a significant effect on the prevalence of ever and current use of contraception in the Mountains and Hills. When the husband is present, the prevalence of use is higher in the Mountains and Hills. The remaining factors, such as the presence of in-law(s), other female(s), other male(s), did not affect the prevalence of ever use and current use in the Mountains and Hills. The prevalence of contraceptive ever use and current use

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[16] The number of respondents who are ever users and current users is too small to subdivide them further according to specific method of contraception. Thus, the effects are measured on the total use only.

is significantly higher when the in-law(s) and other female(s) are not present during the interview in the Plains. Though the presence of the husband or other male(s), in the Plains, leads to lower prevalence of ever use of contraceptive as well as of reported current use, the differences between the two figures are not significant.

TABLE 3.10: PERCENT OF RESPONDENTS WHO HAVE EVER USED METHOD OF CONTRACEPTION BY SEX OF INTERVIEWER AND WHETHER OTHER PERSON(S) PRESENT DURING INTERVIEW IN MOUNTAINS AND HILLS AND PLAINS, 1981.

Sex of interviewer and person(s) present during interview	Mountains and Hills		Plains	
	Number of women	Percent ever used	Number of women	Percent ever used
Sex of interviewer				
Male	-	-	1961	10.0
Female	-	-	985	9.2
Husband				
No	2217	6.4*	2195	10.2
Yes	691	12.2	700	8.2
In-law(s)				
No	2751	7.8	2553	10.4*
Yes	158	7.5	343	4.7
Other female(s)				
No	2350	7.9	1790	11.8*
Yes	559	7.2	1106	6.4
Other male(s)				
No	2693	7.7*	2512	10.0
Yes	216	8.1	384	8.0

Notes: * indicates difference in percentages between male and female or present and not present significant at one percent level.

Source: The Nepal Contraceptive Prevalence Survey data, 1981.

As we can see from the data, the overall effects on the proportion of ever users and current users are limited. With the application of correction factors, the presence of the husband during the interview leads to overreporting the prevalence of current users by only 1.4 percentage points in the Mountains and Hills. Due to the presence of the in-law(s) and other female(s), the prevalence of current use is underreported by only 0.6 and 1.8 percentage points respectively.

TABLE 3.11: PERCENT OF RESPONDENTS WHO ARE CURRENT USERS OF METHOD OF CONTRACEPTION BY SEX OF INTERVIEWER AND WHETHER OTHER PERSON(S) PRESENT DURING INTERVIEW IN THE MOUNTAINS AND HILLS AND PLAINS, 1981.

Sex of interviewer and person(s) present during interview	Mountains and Hills		Plains	
	Number of women	Percent of current users	Number of women	Percent of current users
Sex of interviewer				
Male	-	-	1961	7.9
Female	-	-	985	7.0
Husband				
No	2217	4.7*	2195	7.7
Yes	691	10.7	700	7.3
In-law(s)				
No	2751	6.2	2553	8.2*
Yes	158	4.9	343	3.4
Other female(s)				
No	2350	6.3	1790	9.4*
Yes	559	5.4	1106	4.7
Other male(s)				
No	2693	6.1	2512	8.0
Yes	216	6.9	384	4.9

Notes: * indicates difference in percentages between male and female or present and not present significant at one percent level.

Source: The Nepal Contraceptive Prevalence Survey data, 1981.

3.5 CONCLUSIONS

The quality of the Nepal Fertility Survey(1976) and the Nepal Contraceptive Prevalence Survey(1981) data is evaluated in this chapter. It is noted that the degree of age misreporting is lowest in the NFS followed by the CPS and the 1971 and 1981 Censuses. It is argued that the slightly higher age heaping that occurred in the CPS than in the NFS is due to differences in the priority emphases of these surveys. However, there are no differences in the five-year age-group distributions.

The omission and displacement of births occurring in the last five years before the survey are negligible in the NFS. The omission of births is noted, particularly births to the older women occurring more than ten years before the survey. In the CPS, there is a gross underreporting of births occurring in the recent past. As a result, a false decline in the total marital fertility rate is suggested. It is argued that an underreporting of live births occurred due to a deficiency in the questionnaire design.

With respect to the reliability of the family planning data collected in the CPS, a large majority of the Nepalese respondents were very co-operative during the interview. However, the proportion of women with knowledge on contraceptives is higher when women are interviewed by women.

In the Mountains and Hills, the presence of husband increases the proportion of women reporting knowledge of contraceptives while the presence of other male(s) decreases the proportion of women with knowledge of contraceptives, paricularly oral pills, male and female

sterilization. In the Plains, the proportion of women reporting knowledge of contraceptives is higher when 'in-laws' and 'other male(s)' are present during the interview.

It is found that the sex of the interviewer did not affect the reported prevalence of contraceptive use. Similarly, any effects on reported prevalence of contraceptive use due to the presence of other persons during the interview are negligible.

With respect to the degree of validity and direction of bias, reporting of contraceptive practice as noted by J. Laing(1984), varies from place to place, between husbands and wives, and depending on the nature of the survey questionnaires. Several researchers (Mauldin, 1965; Raman, 1980; Green, 1969; Poti et al., 1962; Hermalin, 1975; United Nations, 1961) conducted research on contraceptive use differences between husbands and wives. Some of the studies found that wives tended to report lower levels of contraceptive use than husbands. The opposite was also found in some studies. With regard to the nature of the survey questionnaires, Laing(1984) pointed out a definitional problem in all four core questionnaires designed by International Union for the Scientific Study of Population, Population Council, World Fertility Survey, and Westinghouse Health Systems. The form of the question can alter the reported contraceptive use level. The reading of a list of methods and the use of open-ended questions both have deficiencies(United Nations, 1979). The former may overestimate, while the later may underestimate the levels of contraceptive use. Thus, analysis on contraception should be carried out keeping in mind all these drawbacks that might occur in the survey.

CHAPTER 4

MARRIAGE AND FERTILITY

4.1 INTRODUCTION

The aim of this chapter is to investigate the pattern of marital fertility among different sub-groups in Nepal. As we have observed in Chapter 1, the level of fertility is quite high[1] and there was apparently no trend in the fertility level before 1976. The Contraceptive Prevalence Survey(CPS) conducted in 1981 collected information regarding births in the five years prior to the survey and number of children ever born among currently married women. Based on these two pieces of information, the total fertility rate was calculated for 1981 (see Appendix 4.1). The estimated total fertility rate, 6.8 per woman in 1981, was at about the same level as in 1976.

Owing to lack of data to examine fertility differences from the Nepal Contraceptive Prevalence Survey(CPS), 1981, the analysis for this chapter will be based on the data from the Nepal Fertility Survey(NFS), 1976.

In studying the pattern of marital fertility, two measures of fertility will be employed: (1)number of children ever born to currently married women aged 15-49; and (2)number of children ever

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[1] Total fertility rate estimated based on the Nepal Fertility Survey data (1976) was 6.3 per woman (Goldman, et al., 1979:21) and it was 6.4 per woman based on The Demographic Sample Survey data (1976)(Bourini, 1977:10).

born in the last five years to currently married women aged 15-49 who have been married for at least five years. These two measures will provide us with estimates of the fertility of women at different times. The first will largely indicate past fertility while the second measures more recent fertility and also yields total marital fertility rate.

The use of independent variables is necessarily severely restricted. Differential marital fertility will be examined by geographical region, religion, ethnicity, education of husband[2] and work status of woman and husband, controlling for age at marriage. Findings of two separate approaches, bivariate and multivariate analysis, will be presented.

Before the analysis of differential fertility, it is important to identify those intermediate variables which affect the level of fertility. As discussed in Chapter 2, there are eleven intermediate variables in the Davis-Blake model but not all of them can be examined due to lack of data. However, Bongaarts(1982:179) has found that only four are really important: (1)proportions married; (2)contraception; (3)induced abortion; and (4)the effect of postpartum infecundability. He indicated that these four variables explained 96 percent of the variation in the observed fertility rate.

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[2] Wherever data permit the education of the woman will be analysed as well. Some variables will be regrouped according to the number of cases.

With due consideration to data constraints and relative importance of the intermediate variables[3] in the Nepalese context, the first three of the intercourse variables, those governing the formation and dissolution of unions in the reproductive period, will be examined. Two of the variables will be analysed in subsequent chapters in relation to contraception variables.

4.2 MARRIAGE FORMATION

In a review of theories of the relation between nuptiality patterns and types of social organization, McDonald(1983:2) noted three distinct stages of social organization which Marx and Weber stated distinctly in their social evolution studies. The first form of such an organization is that where the lineage[4] controls its members and provides them with economic, physical and spiritual security. Each member of the lineage has a defined position; thus the generation of elders occupies a place tightly controlling and organizing marriage of their younger members for the sake of the security of the lineage. The second form of organization is that where rights of access to the property owned by a kin-group or individual will be only by inheritance. Hence, the older generation has power which makes the younger generation dependent upon them.

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[3] Data regarding the practice of abortion and postpartum infecundability are not available in Nepal. According to the NFS data, only six percent of ever-married women aged 15-49 were reported as having heard of induced abortion.

[4] A lineage is defined as a unilineal group whose members trace their descent from one ancestor and know the genealogical connections to that ancestor (McDonald, 1983:37).

McDonald(1983:4) noted:

> In this second form of organization, alliance through marriage will be important to the ruling class so that their marriages will tend to be exogamous and marriage will be tightly controlled by the parental generation. Restrictions on both social and physical mobility will mean that marriage for the peasantry will be characterized by local endogamy. Single people of the peasantry may also be given relatively more freedom in choosing their partner, but where society is highly differentiated this freedom may need to be restricted because of the rules of class or caste endogamy or because of the need for compensation, usually in the form of dowry, when these rules are alleged to have been violated.

The last form is the one which prevails at present in the Western world. In this urbanized, industrialized and individualized society, marriage occurs by free choice without any restriction by lineage or by parents.

In every society, one of the three forms of social organization operates to exert some form of control upon marriage. Though historical and anthropological evidence regarding cause and effect is scanty, an attempt is made to explain the nuptiality pattern that prevails in the Nepalese social organization.

Information on marital status is available for as far back as 1952/54. In the 1952/54 census[5], marital status information was recorded for all persons aged five years and over. Unfortunately, information was not tabulated by single years of age or 5-year age-group. It was available only in very broad age categories. The

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[5] The political revolution coincided with the time of the census. Thus, the government decided to conduct the census in two phases. The eastern part of Nepal was enumerated during 1952 and the western part was enumerated during 1954.(HMG of Nepal, 1958).

1961 and 1971 censuses collected marital status information for all persons aged six years and over. More recently, the 1977 Mid-Term Population Sample survey[6] also collected marriage information. A more scientific and statistically sound sample survey, known as the Nepal Fertility Survey(NFS) 1976, collected marital status information in a household survey and detailed information in an individual survey. Apart from the NFS, no other surveys collected detailed information on marriage in Nepal. The Nepal Contraceptive Prevalence Survey(CPS), 1981 did not collect any information relating to marriage. Data from the 1981 National Population census have not yet been published.

Table 4.1 presents the proportions of ever married and currently married women for 1961, 1971 and 1976 by age of woman. Comparisons of the percentage of ever married women indicate that there was a substantial decline between 1961 and 1971 for women aged up to and including the 15-19 age-group. Proportions based on the 1976 survey suggest that there was no change in the age pattern of marriage between 1971 and 1976. A substantial decline in the proportion of ever married women during 1961-71 could be due to change in the legal minimum age at marriage. The new law which came into existence after August 1963 aimed to prevent child marriage[7] by setting the minimum

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[6] This was an intercensal population survey based on a stratified two-stage sample design. From each of the 75 districts, 100 wards (except for the two smallest districts) were selected on probability proportion to the number of households in the wards. In the next step, households were selected with a systematic sample of 1 in 6 households (HMG of Nepal, 1979).

[7] The new law which is known as Naya Mulki Ain was introduced to bring about a number of changes in social practices such as child marriage, remarriage, polyandrous and polygynous marriage, etc.

TABLE 4.1: PROPORTION OF EVER MARRIED WOMEN BY AGE OF WOMAN FOR 1961, 1971 AND 1976 IN NEPAL.

	1961 census[1]		1971 census[2]		1976 NFS[3]		1976 mid pop.[4]	
Age-group	Ever married	Currently married	Ever married	Currently married	Ever married	Currently married	Ever married	Currently married
6-9	5.3	5.3	2.3	n.a.	n.a.	n.a.	n.a.	n.a.
10-14	24.8	24.6	13.4	13.4	n.a.	n.a.	9.5	9.4
15-19	73.8	71.4	60.7	60.2	62.7	61.5	56.8	56.5
20-24	94.6	91.6	92.1	91.1	94.0	92.6	90.9	89.9
25-29	98.1	93.7	97.4	95.4	98.2	95.7	96.9	95.0
30-34	99.0	91.8	98.6	95.0	98.8	93.4	98.3	94.7
35-39	99.2	86.6	98.9	92.0	99.4	90.0	98.8	91.8
40-44	99.3	78.3	99.1	86.6	99.5	83.9	98.7	85.9
45-49	99.4	68.6	99.2	80.6	99.3	76.4	99.1	79.9
50-54	99.4	59.9	99.3	70.8	99.2	66.1	98.8	68.4
55-59	99.5	50.1	99.4	66.6	99.8	59.1	99.5	63.1
60 years +	99.5	32.1	99.4	44.4	99.4	35.8	99.4	35.4

Note: n.a. indicates data not available.

Sources: [1] CBS, 'The analysis of the population statistics of Nepal,' Table4.1.
[2] ibid., Table 4.2.
[3] Ministry of Health, 'Nepal Fertility Survey, 1976: First Report', Table II4.
[4] HMG, 'Mid-Term Population : 1976', Table 12.

age of marriage at 14 years for females and 18 years for males. Subsequently, the lower age limit of marriage was raised to 16 years for females. While there is a slight decrease in the proportion of ever married women, particularly for those aged less than 20 years, the pattern of universal marriage continued to be prevalent till 1976.

The age pattern of proportions of women currently married is virtually the same (Table 4.1). The proportion of currently married women increased between 1961 and 1971, particularly among women aged 25 and older. However, 1976 data (NFS and Mid-term population survey) do not show any changes in the distribution of currently married women compared to 1971 census data.

AGE AT MARRIAGE

In the Nepalese censuses, age at marriage was not asked. Therefore, it is not possible to calculate the mean age at marriage of women directly. The only source of information regarding the age at marriage was from the Nepal Fertility Survey(NFS), 1976, in which date of marriage and date of consummation of marriage questions were put to individual woman. Questions asked in the NFS are reproduced in Appendix 4.2.

Based on the proportion of single women by age, Hajnal's (1953:111-136) singulate mean age at marriage (SMAM) can be derived. This index measures the mean number of years spent unmarried among women ultimately marrying and it is a good summary indicator of age at marriage though it may provide a biased estimate if the marriage pattern is changing (Agarwala, 1962:9). Singulate mean ages at marriage for various periods are presented in Table 4.2; they suggest

an increase of one year over the ten years period between 1961 and 1971. During the next five years, between 1971 and 1976, there was a negligible increase in age at marriage.

TABLE 4.2: SINGULATE MEAN AGE AT MARRIAGE (SMAM)

Year	Singulate mean age at marriage (SMAM)
1961 census[1]	15.7
1971 census[1]	16.8
1976 NFS[2]	17.1
1976 Mid term population	17.2

Note: Singulate mean age at marriage (SMAM) is calculated based on Hajnal's formula using single age; for 1976 mid term population, 5 years age-group is employed to calculate SMAM.

Sources: [1] CBS (1977), 'The analysis of the population statistics of Nepal', page 102.
[2] Smith, David. P. (1980), 'Age at First Marriage' Comparative Studies, No.7, ISI/WFS, Table 2.

Generally, the mean age at marriage estimated from answers given by women provides better evidence of age at marriage. However, there are three points to be mentioned here regarding this method. Firstly, age at marriage reported in the NFS(1976) has been adjusted[8].

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[8] Age at marriage was adjusted according to age at cohabitation. If age at cohabitation is less than age at menarche, then age at menarche is taken as age at marriage (Ministry of Health, 1977:35).

Secondly, information regarding remarriage was not collected[9]. Thus, age at marriage reported is regarded as first marriage though a small number of remarriages might have been reported. And thirdly, it is to be noted that cross-sectional data on age at marriage collected from a sample survey of ever married women are subject to a censoring effect. Generally, the effect is more pronounced in the younger age-groups. As a result, it will show upward trends across cohorts. To resolve this problem, mean age at marriage is estimated based on ever married women aged 25 or more and married before the age of 25. However, this estimate has two deficiencies. Firstly, we will not be able to examine changes in marriage pattern among two younger cohorts (15-19 and 20-24). These women have to be deleted from the analysis as their marriage experience would not have been completed. Secondly, there is a need to avoid truncation effect in comparing across cohorts. Mean ages at marriage calculated for those women who were married before their 25th birthday by age-groups suggest that there was no historical trend in age at marriage (see row total in Table 4.5).

Various sophisticated methods have been applied to examine the age pattern of marriage in Nepal based on the NFS(1976) data. One technique to measure age at marriage is the life table analysis which takes into account the distribution of single women by current age and ever married women by ages at marriage and at interview. David Smith(1980:1-18) has applied this technique to nineteen WFS countries

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[9] Remarriage questions were not asked in the NFS(1976) because they were found to be sensitive and embarrassing for the Nepalese. Apart from this reason, remarriage is not frequently practised in Nepalese society.

including Nepal for a comparative study. The cumulative proportion of ever married women for each birth cohort by age at marriage is presented in Appendix 4.3 and plotted in Figure 4.1. A summarized version of Appendix 4.3 is presented in Table 4.3 which shows that in every percentile considered (10th., 25th., 50th., and 75th.), ages at

TABLE 4.3: AGES AT WHICH 10, 25, 50 AND 75 PERCENT OF WOMEN ENTER MARRIAGE FOR COHORTS OF AGES 15-49, 1976.

	Percentile			
Cohort	10th	25th	50th	75th
15-19	12.3	14.4	16.8	*
20-24	11.6	13.4	15.8	18.2
25-29	11.0	13.0	15.2	18.2
30-34	11.0	13.0	15.0	17.9
35-39	11.7	13.5	15.6	18.7
40-44	11.0	13.2	15.6	18.8
45-49	11.0	13.6	15.8	18.8

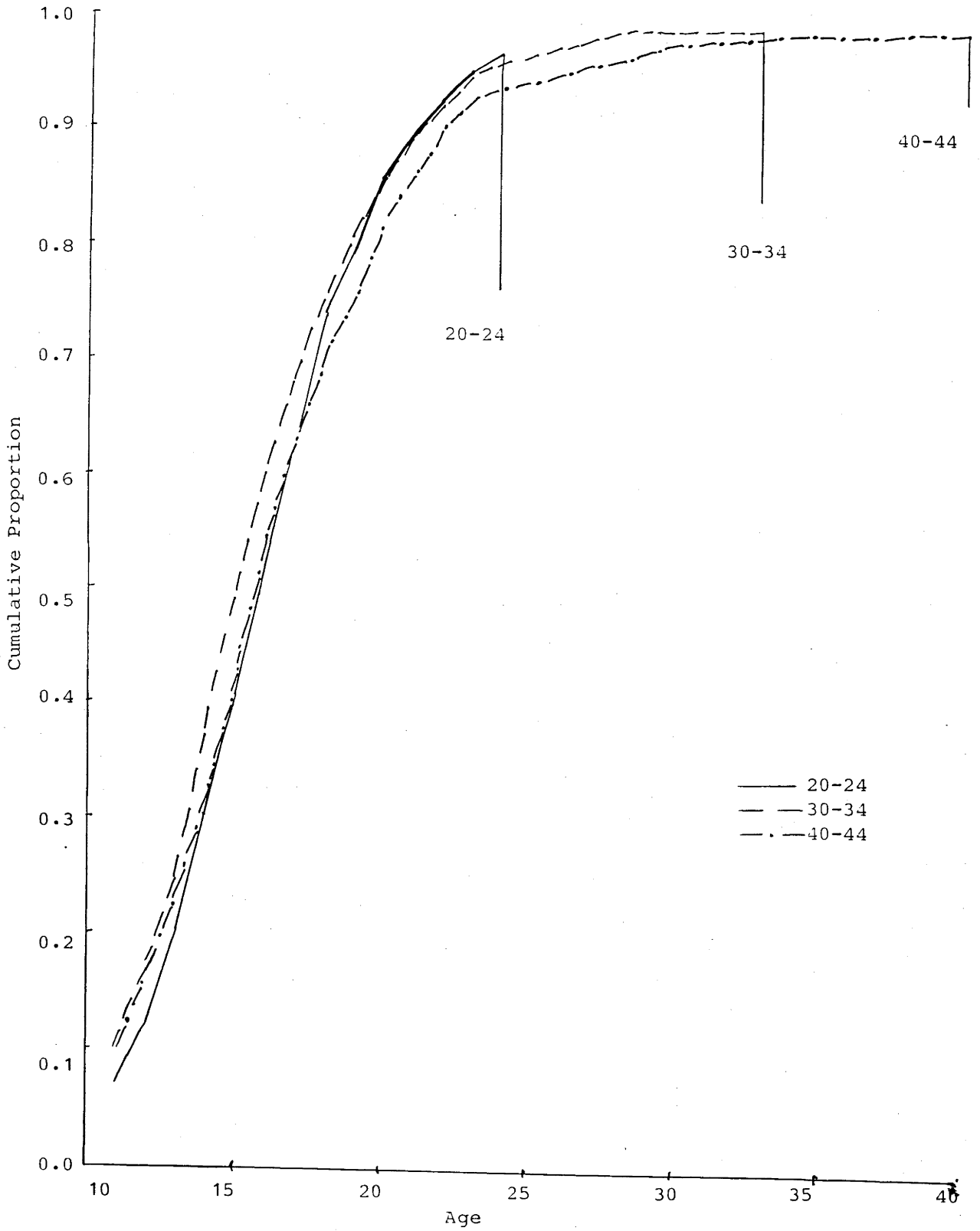
Note: * indicates the cohort has not reached 75th percentile.

Source: Smith, D. P.(1980), 'Age at First Marriage', Comparative Studies, No. 7, April, Tables 3 to 7.

marriage do not vary across age-groups with the exception of the youngest age-group 15-19. A slight increase in age at marriage among this youngest age-group cannot be confirmed as the increase is very slight and could be due to small size.

The second technique is based on Coale's(1971) model, which was derived from his findings that there is a common age pattern of first

FIGURE 4.1: CUMULATIVE PROPORTION OF WOMEN 20-24, 30-34 AND 40-44 EVER MARRIED, AT SINGLE YEAR AGES BETWEEN 11.0 AND 40.0; NEPAL FERTILITY SURVEY, 1976



Source: Appendix 4.3

marriage frequencies. Coale states:

> We have evidence of the same basic curve of first marriage in cohorts that marry early and cohorts that marry late, in cohorts in which marriage is virtually universal, and in cohorts in which one-quarter remain single. Moreover, the uniform age structure of nuptiality occurs in societies in which most marriages are arranged by families with little regard for the preference of bride and groom, and in societies in which marriages typically result from the self-selection of mutually preferred partners. (Coale, 1971:203).

In Coale's model, the first marriage pattern can be explained fitting the standard curve which computes three parameters for each cohort: (a) age at which significant number of first marriages occur, (c) proportion of ultimately ever-married, and (k) the scale factor expressing the number of years of marriage in the given population equivalent to one year in the standard population.

Rodriguez and Trussell (1980) modified Coale's model so that indices can be interpreted easily with the help of maximum likelihood estimates. They translated the first two parameters of Coale's model into mean age at marriage($\hat{u}$) and standard deviation($\hat{\sigma}$). The value of c which is the proportion of each cohort eventually marrying is the same as Coale's parameter($\hat{C}$).

The results[10] of fitting the model to the Nepal Fertility Survey(NFS), 1976, data are presented in Table 4.4. The P-value presented in the last column of Table 4.4 indicates that Coale's model fits well at the five percent level for all age-groups except the

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[10] Estimated parameters are obtained with the use of a computer package called NUPTIAL which utilized Coale's model and modification by Rodriguez and Trussell(1980).

TABLE 4.4: ESTIMATES OF THE MEAN AND STANDARD DEVIATION OF THE AGE DISTRIBUTION OF FIRST MARRIAGES AND THE PROPORTION EVENTUALLY MARRYING, BOTH HOUSEHOLD AND INDIVIDUAL DATA, 1976.

Age Group (Cohort)	Type of Estimate of C	$\hat{u}$	$\hat{\sigma}$	$\hat{C}$	S.E.$\hat{u}$	S.E.$\hat{\sigma}$	S.E.$\hat{C}$	P-Value (HH+I)
Conventional Age groups								
15-19	Estimated	20.3	6.9	1.589	0.669	0.470	0.130	0.000
	Fixed (C=0.992)	17.1	4.8	0.992	0.142	0.126	a	0.000
20-24	Estimated	17.0	5.2	1.079	0.190	0.160	0.010	0.000
	Fixed (C=0.992)	16.2	4.5	0.992	0.111	0.082	a	0.034
25-29	Estimated	16.2	4.7	1.014	0.156	0.134	0.004	0.000
	Fixed (C=0.992)	15.9	4.5	0.992	0.134	0.110	a	0.000
30-34	Estimated	15.8	4.5	0.995	0.144	0.126	0.004	0.000
35-39	Estimated	16.6	4.9	0.998	0.184	0.151	0.003	0.556
40-44	Estimated	16.4	5.7	0.998	0.184	0.151	0.002	0.002
45-49	Estimated	16.6	5.1	0.994	0.219	0.181	0.004	0.028
Broad Age groups								
15-49	Estimated	16.4	4.8	0.998	0.055	0.049	0.001	0.000
20-49	Estimated	16.2	4.7	0.998	0.061	0.052	0.001	0.000

Notes: a indicates not estimated.

Source: NUPTIAL results for World Fertility Survey data-sets from Smith et al .(1982), 'Cohort Nuptiality in Asia and the Pacific: An analysis of the World Fertility Surveys', Working Paper, no.25, East-West Population Institute, Table 5f, May.

35-39 group.

The application of a variety of techniques confirms that there was no discernible change in the age pattern of first marriage in Nepal.

The third parameter($\hat{\sigma}$) of Coale's model, a standard deviation for the distribution of ages at first marriage derived reveals quite an interesting marriage pattern. The high value of($\hat{\sigma}$) indicates how dispersed are ages at marriages in Nepal. The values of($\hat{\sigma}$) presented in Table 4.4 indicate that unlike in Bangladesh and South Korea[11], there is a dispersion of ages at marriage for each cohort, the value ranging from 4.5 to 6.9 in Nepal. Dispersion of ages at marriage could occur through social and economic development and cultural differences within the country. It could also perhaps be due to extreme social inequality. The following section will explore factors which affect the level of age at marriage in Nepal.

FACTORS AFFECTING THE AGE AT MARRIAGE

The theory regarding the social determinants of the timing of the first marriage is not well known. While anthropologists have given attention to kinship and marriage, demographers are engaged in understanding the relation between marriage and fertility (Hawthorn, 1970:86; McDonald, 1983:1). The age at which marriage occurs in a nuclear family system tends to be late because the economic situation

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[11] The values of($\hat{\sigma}$) are in the range of 2.9 to 4.5 for Bangladesh and 2.6 to 6.0 for South Korea(Smith, et al., 1982:13,16)

has to be strengthened to be able to set up a separate household. In an extended family system where the formation of a new separate household is not a condition, marriage occurs early (Hawthorn, 1970:87). In a Hindu society where the kinship system is very strong, marriage is considered as one of the sixteen classical stages (Samskara) in a person's life. One of the ways in which a person is considered a mature man (Admi) is through his marriage (Mayer, 1960:215). Young members of the household should obey all rules of etiquette and have respect for their elders.

Judith Blake (1967:136) looks at marriage somewhat differently from this emphasis on kinship systems. She hypothesized that age at marriage is higher where selection of partner for marriage is made by free choice rather than by an arranged match. The former type of marriage usually occurs only when both mates are old enough to make their own decision and are sufficiently independent financially to be able to set up a separate household. Early marriage occurs in entirely different conditions, where parents will often make the decision for their sons and daughters. Children will be supported financially and reside with parents even after their marriage.

Peter McDonald(1981:416), in an attempt to develop a framework for analysis of nuptiality, looks at marriage in relation to its functions in each culture. Functions, as he observed, in the major cultures are classified into three categories: economic, social and personal. Economic functions of marriage may have to do with establishing a separate new household. Marriage may provide a means of economic security and it may also serve as an instrument to make a division of labour. Marriage also provides means for the exchange of

wealth. Depending upon the cultures, the social functions of marriage serve as an important element in the maintenance or transformation of the social structure in many ways. Marriage may strengthen or weaken social differentials. It can form or strengthen social or political alliances, continue family lineage, and provide a means of social control of sexual activity. It helps to maintain the socio-political role relationships in the society and serves to reinforce or establish the social prestige of those involved. Aside from those functions which may have important effects on individuals, there are certain functions that are specifically personal. In many cultures, marriage may only be sanctioned to enter into the sexual act and as a source of affection, love and emotional support. It may also be a means to achieve spiritual reward in a religious sense.

McDonald has pointed out that some or all of these functions may be operating in any given society. Furthermore, changes in function may occur due to changes in the prevailing social structure and its value system which in turn affect the marriage customs including marriage age. The process of change in social structure and value systems may be brought about by technological advances, environmental changes, resources depletion, industrialization, urbanization, education, population changes, development of new ideas from external culture or internally, and many other factors.

In trying to find factors affecting the age at marriage among the Gurung community in Nepal, Macfarlane (1976:221) identified several possible causes that would have varied the age at marriage. Marriage could occur earlier or later depending on the timing of inheritance and rules of inheritance. Age at marriage can also be affected by the

amount of capital required at marriage. It can also be determined by the size of the kin group to which the couple belong. The amount of money that is required for marriage can easily be borrowed from other kin groups, to be paid back over the years as they support other kin members' weddings. Other determining factors can be how marriage is arranged, the standard of living and availability of partners.

The following analysis will basically aim to identify the sub groups which practise early marriage and late marriage. An attempt is made to relate their marriage patterns with the cultural practices that prevail in their societies based on anthropological research.

Mean ages at marriage according to different background characteristics are presented in Table 4.5 controlling for age of woman. Data indicate that women from the Mountain region tend to marry later than women from the Hills and Plains. According to anthropological research, people from the Mountains have entirely different marriage functions than others.

Two of the major groups inhabiting the Mountain region are Bhotes and Sherpas. There are several peculiar practices that may have led to relatively late marriage among them. According to their social traditions, every married couple must establish an independent household even if the bridegroom's father has to divide his own house (Furer-Haimendorf, 1964:39). Though young Sherpas have freedom to select their partners, it usually takes several years to become a legal couple. There are three major wedding rites, Sodene, Dem-chang and Zendi or Gyen-kutop which must be completed before a bride can be brought to her new home (Furer-Haimendorf, 1964:41-68). Often the gap

TABLE 4.5: MEAN AGE AT MARRIAGE (IN YEARS) BY BACKGROUND CHARACTERISTICS CONTROLLING CURRENT AGE OF WOMAN, 1976

Background characteristics	Age of woman 25-29	30-34	35-39	40-44	45-49	Total
Total						
Geographical region						
Mountains	16.0	16.6	16.0	15.8	15.0	16.0
Hills	15.4	15.2	15.9	15.8	16.0	15.6
Plains	15.0	15.0	15.3	14.9	15.3	15.1
Ethnicity**						
Gurungs	16.5	(18.5)	(17.5)	(16.8)	*	17.6
Tamangs	17.1	16.4	(18.7)	(18.0)	(17.7)	17.5
Rais	16.5	17.1	(17.4)	(17.2)	(18.4)	17.2
Magars	16.3	16.6	16.5	16.4	16.9	16.5
Newars	16.0	16.2	16.4	17.5	16.9	16.5
Chhetris	15.4	14.9	15.1	15.3	15.5	15.2
S-D-M-D @	15.9	(14.6)	14.8	(15.4)	(15.8)	15.2
Tharus	14.8	14.8	15.9	15.5	(15.8)	15.2
Muslims	14.1	(13.8)	(15.2)	14.6	(15.3)	14.5
Brahmins	13.9	13.0	14.0	13.1	13.2	13.5
Others	14.8	15.1	15.6	15.4	15.1	15.2
Religion						
Buddhism	17.1	16.8	18.7	17.1	(18.0)	17.4
Hinduism	15.2	15.2	15.6	15.4	15.6	15.4
Islam	14.2	(13.8)	(14.9)	14.6	15.7	14.6
Work status of woman before marriage						
No work	14.7	14.6	15.2	14.7	15.1	14.8
Non-farming	(15.3)	*	*	*	*	16.3
Farming	16.1	16.2	16.4	16.5	16.6	16.3
Education of husband						
No schooling	15.4	15.3	15.7	15.6	15.7	15.5
Primary	15.1	15.4	15.0	15.2	(15.7)	15.0
Middle +	14.9	15.1	15.7	(13.7)	(15.1)	15.1
Work status of husband						
Non-farming	15.1	14.7	15.6	15.3	15.6	15.2
Farming	15.3	15.3	15.7	15.6	15.7	15.5
Total	15.3	15.2	15.7	15.5	15.7	15.4

Notes: * indicates denominator is less than 10 women.
() indicates that mean is calculated based on less than 25 but more than 10 women in denominator.
@ S-D-M-D stands for Satars, Dhanuwars, Majars and Darais.
** a small number of Sherpas excluded from ethnicity variable.

Sources: Tabulated from the Nepal Fertility Survey data, 1976, standard recode, version 1, London: ISI/WFS.

between each of these rites could be several years.

Sodene is to put a formal request by the father or a senior member of the boy's kin group to the girl's parents. At the time of Sodene, the couple planning engagement may have already been lovers for some time. In extreme cases, the girl might have become pregnant. If the proposal is accepted, the young man has a right to visit his future wife at night and may engage in regular sexual activity. Depending on the relation between these two young persons, the next rite, Dem-chang towards marriage may or may not occur. An acceptance of formal proposal does not necessarily mean that the couple will be in a permanent union.

Dem-chang rites usually require a considerable expenditure which may be the cause to delay several years for Dem-chang after Sodene. After completion of this rite, their children, if any, will have full rights of legitimacy. However, both of them will continue to live with their respective parents. In any event if the boy wants to bring his future wife home before the final wedding ceremony, he has to pay her wages.

By the time the final wedding, Zendi or Gyen-kutop is performed they may have one or two children[12]. They will become legally husband and wife after the completion of this ceremony. Furer-Haimendorf (1964:56) suggests a delay of this ceremony may have occurred because of the need of the daughter's labour, and the

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[12] Due to the relatively infertile period following the menarche, very few women have one or two children before the final wedding rite. (Furer-Haimendorf, 1964:41).

bridegroom not having the capacity to set up a household of his own.

Other minority groups (Dhinga, Lhomi etc.) in the mountainous region also have the freedom of selecting their partners(Bista, 1972:170 and Ross, 1981:74). The Dhinga who are from the western Mountains also do not practise childhood bethrothal (Ross, 1981:74).

Unlike the people of the Mountain region who have many common social traditions and practices which might have caused them to delay their marriages, there are wide divisions among different groups in their culture and social tradition in the Hills and Plains. Therefore, in order to discuss factors affecting age at marriage in these regions it will become essential to look at them by each ethnic group.

Mean ages at marriage presented in Table 4.5 according to ethnic groups clearly show two distinct age patterns of marriage. All those ethnic groups, namely, Gurungs, Tamangs, Rais, Magars and Newars who belong to the Mongoloid and Tibeto-Burman language group tend to marry later than those from the Indo-Aryan groups. Of all the ethnic groups in Nepal, mean ages at marriage are highest for Gurungs, Tamangs and Rais. Brahmins tend to have the lowest age at marriage.

Higher mean ages at marriage among Gurungs in comparison to many other Nepalese societies have been documented by Macfarlane (1976:220). From his village level data, he found that two-thirds of marriages occurred at between 17 and 21 years among Gurung women. The mean age at marriage was just over 19 in his village. He suggested several factors that might have accounted for higher age at marriage among Gurungs. Unlike other Nepalese societies, Gurungs do not live

in a joint family. Their family usually consists of husband and wife with their unmarried children. It is expected that a few years after marriage, a couple must set up an individual household. The same type of social tradition exists among Limbu society (Caplan, 1974:185). Therefore, marriage occurs fairly late so that a family will have sufficient time to accumulate capital to provide a separate household for the new couple. Another important factor is the way in which a marriage is arranged. Among Gurungs, Tamangs and Rais, selection of partner is usually made by free choice. Marriage in these societies occurs once the young couple are attracted to each other. However, the extent of sexual freedom before marriage that Sherpas enjoy does not seem to exist in these societies. To some extent, young couples among the Newars and Magars also enjoy freedom of selecting their partners. Such a freedom among the Newars is attributed mainly to western education, political liberalism and economic considerations (Bajracharya, 1959:418).

Like Gurungs, Tamangs, Rais and Magars, the remaining ethnic groups also have their own traditions regarding marriage. Two of the common features of these groups are the joint family system and parentally arranged marriage.

The mean age for Newari girls at marriage is 16.5 years which is three years higher than the mean for the Brahmin girls. Among Brahmins the traditional pattern of early marriage is due to the fact that the girl is to be married off before menarche.

> A man who has failed to marry off his daughter prior to first menstruation is said to have committed the sin of embryo murder, and her presence in his household endangers the purity of all of its adult male residents. Hence the pre-pubertal marriage of girls must be understood as an

> institutionalised response to the dangers believed to be associated with reproductive sexuality outside the confines of marriage.(Allen, 1982:180).

In order to solve the problem of such control of female sexuality, three types of institutions exist among the orthodox Brahmins. They are: the bethrothal of girls prior to first menstruation, the absolute control of sexually active women by their husbands, and the prohibition against widow-remarriage. As a result of the development of these institutions, Brahmin girls are to be married off before menarche. Once married they are not allowed to divorce. Furthermore, widow remarriages are strictly prohibited.

Michael Allen (1982) confirms, based on his anthropological study[13], that the Newars also followed this orthodox pattern which required pre-puberty marriage (p.180). While comparing pre-puberty marriages performed by Newars with those of Brahmins, he found that unlike Brahmin girls, Newari girls go through a ritually elaborate mock- marriage during childhood. Ihi[14], referred to by Michael Allen as a marriage rite among Newars, is carried out before puberty. During the two days ceremony of Ihi, purification is the main function before the Kanyadan ('the giving of the virgin') event is performed.

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[13] Michael Allen did his research in Kathmandu during 1973-74 and 1978-79.

[14] Ihi is considered one of the most important domestic rituals among Newars. Ihi is performed, usually, in a group. A group may consist of a few girls to twenty four girls. This rite is usually combined with some other ceremony, such as an old-age ceremony.

In the process of Kanyadan, a Newari girl is married to a supposedly celibate god. In the orthodox Hindu marriage, Kanyadan is actually done giving away a virgin girl to a boy prior to menarche.

Among these two groups, consummation takes place only after menstruation begins. Brahmin and Newari girls both have to observe a pre-menstrual rite. Again, as Michael Allen (1982:195) pointed out,

> ... in both cases the ritual treatment of first menstruation begins with a strict three day period and is followed by a more relaxed longer period during which the girl loses her virginity. The only difference is that whereas the Brahmin girl is given to and deflowered by her mortal husband, the Newar girl is first given to a celibate god and is then deflowered by either an ugly effigy or the sun god.

Thus, these differences in observed spiritual and religious values might be the reason why Newar girls have higher age at marriage than Brahmins.

By and large, Brahmins and Chhetris look on marriage as a religious rite. Both of these groups follow almost similar marriage rituals. Marriage between a Chhetri girl and Brahmin boy is an acceptable union (Furer-Haimendorf, 1959:232). Because they have the same social practices and beliefs regarding marriage, the question arises why the age at marriage differs between these two groups. Mean age at marriage is 15.2 years for Chhetri girls and 13.5 years for Brahmin girls. Based on the anthropological evidence also, an early pattern of marriage is less frequent among Chhetris[15] than among Brahmins (Bista, 1972:7).

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[15] According to Bista (1972:7), Chhetri girls are married off when they are fully grown whereas among Brahmins, in order to gain Punya, 'merit', their girls of eight to ten years must be given to a Brahmin boy.

Basically, we could identify two reasons for higher age at marriage for Chhetri girls than for Brahmins. Firstly, unlike Brahmin young couples, Chhetri young couples can say whether they like each other or not before parents decide on their marriage. In marriage rituals, there is one extra ceremony which is exclusive to Chhetris (Bennett, 1977:129) before the Kanyadan rite. This is called Swayambar which literally means girl's self choice of a husband. Bennett(1977:129) as informed by his informant writes: 'Swayambars, of course, were grand affairs where thousands of princes and their armies turned out in hopes of being chosen by the princess.'

Secondly, the Thakuri group which is considered the highest class within the Chhetri caste has relatively late marriage because of their concern with status. The amount of dowry[16] to be given is considerably large if one wants to maintain family status. In order to keep the local community unaware of this difficult situation, Thakuri girls are married off to a distant location (Winkler, 1979:307). This type of marriage arrangement will definitely restrict the daughter's ability to revisit her parents frequently. Walter Winkler (1979:306) argued that their marriage was delayed until a bride was ready to separate from the natal home.

The remaining groups (Tharus, Satars, Dhanuwars, Majhis, Darais, Muslims) have slightly higher mean age at marriage than Brahmins and lower than the Mongoloid groups. Except for Muslims, marriage systems that have been adopted by other groups have been influenced by Hindus. The Tharus who were practising various forms of marriage such as

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[16] Dowry is given to the girl by her family at the marriage.

capture and purchase, have adopted the Hindu system (Shrivastava, 1958:139). They also considered marriage as obligatory; an unmarried women does not have social status. The girl's parents, usually, find a partner for their daughter. Unlike in most other societies in Nepal, the girl is older than the boy. It is not unlikely that a boy of seven or eight years is married to a girl of 15 or 16 years(Bista, 1972:121). This may be one reason why Tharu girls have higher mean age at marriage than Brahmins. But it is not known why a boy of seven to eight years gets married to a 15-16 year old girl.

Information regarding the social traditions of the Satars, Dhanuwars, Majhis and Darais is very scanty. Bista (1972:131) reported that Dhanuwars practise marriage by mutual agreement which involves a decision of couples to live together. The age at which the couple decides to live together according to the Bista could be between 29 and 30 years which does not support our finding.

As expected, ages at marriage differ according to religion. Buddhist girls marry much later than Hindu and Muslim girls: mean age at marriage is lowest among Muslim girls in all age-groups. Hindu girls occupy an intermediate position between Buddhists and Muslims. Factors relating to mean ages at marriage are nothing more than the reflection of social tradition and belief practised by each ethnic group. Mongoloid and Tibeto-Burman language groups are either Buddhist or follow Tibetan Buddhist culture. Except Muslims, all other Indo-Aryan groups belong to the Hindu religion. Differences in mean ages at marriage by religious group are not peculiar to Nepal. In Malaysia (Chander, et al., 1977:60) and Sri Lanka(1978:63), mean ages at marriage are found to be highest among Buddhists followed by

Hindus and Muslims.

In a society where labour is in demand, we would expect woman's age at marriage to be higher. If a woman is working or helping her parents on the farm, her marriage is likely to be postponed a few years. Mean ages at marriage according to the work status of women before marriage indicate that those who work before marriage tend to marry almost two years later than those who do not work. This pattern is consistent in all age-groups. On the other hand, it is found from data that husband's work status is not so important in relation to age at marriage. Women whose husbands are working in farming have almost the same mean age at marriage as those whose husbands are working in non-farming occupations. Again, mean ages at marriage do not differ according to husband's educational level. When controlled for age, there is an inverse relationship between age at marriage and education of husband for women aged 25-29 and 40-49.

4.3 MARRIAGE DISSOLUTION

A common cause of marriage dissolution among Nepalese women is the death of their husbands. There are very few women whose marriage was dissolved by divorce or separation. Until August 1963, there was no prohibition on divorce or separation socially or legally except among Newars. Under the Newars' system of formal divorce, both the parties mutually agree to break the marriage by signing the divorce papers, Par-Pachuke-Patra (Nepali, 1965:239). However, it is not necessary to go to court to formalize the document. Neither party can break the marriage tie without the other party's consent. Apart from this system, Nepal has no history on divorce laws nor are there any

data on divorce before 1963 (Daibagya, B.P., 1966; cited from Rajbanshi, et al., 1980:42).

Table 4.6 presents the proportion of widowed by age-groups at various years. As expected, the proportion of widowed increases with an increase in age. Compared to 1961 data, there is a considerable decline in the proportion of widowed in each age-group in Nepal. This is generally attributed to the decline in mortality over the decade. However, the decline does not continue after 1971. In fact, the proportion of widowed increased slightly from 1971 to 1976 in almost

TABLE 4.6: PROPORTION OF WIDOWED BY AGE OF WOMAN FOR 1961, 1971 AND 1976.

Age of woman	1961 Census	1971 Census	1976 NFS	1976 Mid Term
15-19	0.8	0.3	0.6	0.2
20-24	1.6	0.7	0.3	0.6
25-29	3.2	1.6	1.7	1.4
30-34	6.1	3.3	3.8	3.1
35-39	11.6	6.6	8.0	6.7
40-44	19.9	12.1	13.2	12.5
45-49	29.6	18.3	21.4	18.8
50-54	39.0	28.1	31.0	29.7
55-59	47.2	32.4	39.0	35.8
60 years +	65.7	54.6	62.1	63.5

Sources: Same as in Table 4.1

all the age-groups. Therefore, the decline which we have noticed between 1961 and 1971 may have been an exaggeration due to the low quality of 1971 data. All that can be said from these data is that there is an indication of decline in the proportion widowed since 1961 but by how much it is difficult to document.

4.4 PATTERN OF MARITAL FERTILITY

4.4.1 CUMULATIVE FERTILITY

Table 4.7 presents the mean number of children ever born to currently married women aged 15-49 by selected characteristics. The last three columns are: mean number of children standardized using 5-year age distribution of the total population as standard. The standardized mean number of children ever born to all currently married women indicates that fertility is lowest in the Mountains but about the same in the Hills and Plains. However, when the standardized mean number of children is examined for broad age group(15-34 and 35-49), women from the Plains have the highest fertility followed by women from the Hills and the Mountains. Among the older women(35-49) fertility is almost the same for the Hills and Plains but women in the Mountains continue to have lower fertility.

Detailed examination of fertility by age reveals that women from the Mountains have lower fertility than those from the Hills and Plains in each age-group up to 40-44. The mean number of children ever born is slightly higher among women from the Plains than from the Hills up to age 34. By age 35 and over, women from the Hills have slightly higher fertility, although this difference may be an artifact because of reporting errors. It is to be noted that mean numbers of children ever born calculated for age-groups 35-39, 40-44 and 45-49 have some inaccuracies in selected categories due to memory lapse. The same pattern of marital fertility by age has been observed in

TABLE 4.7: UNSTANDARDIZED AND STANDARDIZED MEAN NUMBER OF CHILDREN EVER BORN TO CURRENTLY MARRIED WOMEN AGED 15-49 BY DIFFERENT BACKGROUND CHARACTERISTICS AND AGE OF WOMAN, 1976.

Background characteristics	Age of woman (unstandardized)								Age of woman(standardized)		
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total	15-34	35-49	Total
Geographical region											
Mountains	0.18	1.22	2.56	3.48	4.87	4.80	6.53	3.15	1.88	5.23	2.89
	(38)	(90)	(71)	(65)	(63)	(50)	(34)	(411)			
Hills	0.29	1.44	2.83	4.13	5.27	5.76	6.35	3.30	2.19	5.70	3.24
	(355)	(570)	(564)	(406)	(322)	(337)	(195)	(2749)			
Plains	0.38	1.50	3.11	4.38	5.20	5.96	5.68	3.24	2.36	5.59	3.33
	(320)	(514)	(473)	(332)	(270)	(216)	(154)	(2279)			
Ethnicity											
Mongoloids	0.30	1.31	2.68	4.00	5.23	5.57	6.19	3.35	2.08	5.58	3.13
	(147)	(304)	(303)	(230)	(184)	(192)	(121)	(1481)			
Brahmins	0.28	1.53	3.12	4.20	5.39	6.32	7.03	3.10	2.31	6.11	3.45
	(109)	(146)	(108)	(80)	(59)	(53)	(35)	(590)			
Others	0.34	1.49	3.02	4.27	5.15	5.76	5.90	3.23	2.30	5.55	3.27
	(475)	(747)	(705)	(494)	(413)	(357)	(226)	(3417)			
Religion											
Hindu	0.32	1.48	2.95	4.18	5.23	5.77	6.22	3.27	2.25	5.66	3.27
	(677)	(1089)	(1007)	(756)	(603)	(547)	(341)	(5020)			
Non-Hindu	0.33	1.16	2.73	4.02	4.85	5.53	5.10	3.04	2.06	5.16	2.99
	(52)	(110)	(108)	(51)	(56)	(57)	(40)	(476)			
Education of husband											
No schooling	0.35	1.42	2.84	4.16	5.24	5.84	6.17	3.56	2.20	5.67	3.24
	(367)	(718)	(766)	(603)	(532)	(510)	(321)	(3817)			
Primary	0.26	1.32	2.87	3.92	4.93	5.27	5.13	2.22	2.11	5.10	3.01
	(118)	(168)	(120)	(51)	(42)	(26)	(8)	(533)			
Middle +	0.33	1.52	3.35	4.38	4.93	5.00	5.73	2.28	2.37	5.14	3.24
	(186)	(208)	(145)	(79)	(30)	(23)	(15)	(683)			
Work status of woman											
Not working	0.38	1.56	3.09	4.30	5.20	5.68	5.89	3.33	2.35	5.54	3.31
	(417)	(681)	(633)	(470)	(394)	(335)	(241)	(3171)			
Working	0.24	1.29	2.73	3.98	5.20	5.83	6.44	3.12	2.07	5.72	3.16
	(312)	(517)	(481)	(335)	(265)	(270)	(141)	(2321)			
Work status of husband											
Farming	0.33	1.43	2.95	4.17	5.24	5.87	6.19	3.38	2.24	5.69	3.27
	(514)	(834)	(814)	(625)	(517)	(495)	(308)	(4107)			
Non-farming	0.36	1.54	2.93	4.29	4.98	5.32	5.77	2.99	2.29	5.29	3.19
	(143)	(296)	(255)	(149)	(115)	(92)	(65)	(1115)			
Total	0.32	1.45	2.93	4.17	5.20	5.74	6.10	3.24			
	(732)	(1199)	(1116)	(807)	(659)	(605)	(383)	(5501)			

Notes: Number inside the parentheses indicates number of women.
Standard used here was 5 years age distribution of total women.
Number of women may not add up to total because of 'not reported' and 'don't know' cases.

Source: Tabulated from the Nepal Fertility Survey, 1976, Standard Recode, version 1, London: ISI/WFS.

Nepal in a different data set[17] (Tuladhar, et al., 1982:82).

There is a clear pattern of fertility differences by ethnicity and religion. Among all currently married women aged 15-49, Brahmins have higher standardized fertility than Mongoloids and others. The standardized means by broad age-groups (15-34 and 35-49) indicate only small differences in fertility among younger women (15-34); Brahmins aged 35-49, on the other hand have higher fertility than the other two groups in the same age-group. Looking at the five year age groups, Brahmins have slightly higher mean number of children than the other two groups (Mongoloids and others) in all age-groups except 15-19. Likewise, Hindu women have slightly more children than non-Hindu women in all age-groups, as was expected.

The pattern of fertility differences by husband's education suggests an inverted U-shaped relationship. In every age-group, women whose husbands had primary education have slightly fewer births than those whose husbands did not have schooling. Nevertheless, the mean number of children increases, again, among those women whose husbands had middle or higher education. By age 35 and over, women whose husbands had no schooling tend to have a higher number of children than those having husbands with primary or higher schooling.

There is a difference of 0.15 births between working and non-working among all currently married women aged 15-49. When examined by age-group, the data indicate that there is no consistent pattern of fertility difference. The mean number of children by work

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[17] Demographic surveys were conducted from 1975 to 1978 in four districts in the Hills and Plains(two from each). While selecting districts, they were matched on a set of social and demographic characteristics.

status and age shows that those who work tend to have slightly lower fertility than those who do not work, up to age 30-34. Among women aged 35 and older, the mean is slightly higher for those who worked than for those who did not. The fertility differences by work status of husband present an interesting pattern. Up to age 30-34, there is no difference in fertility between women whose husbands worked in farm and non-farm occupations. By the time women reach an older age (35 years and older), those whose husbands are in farm occupations have higher fertility than women whose husbands are in non-farm occupations.

As we have observed earlier, there is some difference in mean ages at marriage among different sub-groups in the Nepalese population. The pattern of differences in marital fertility described earlier does not take account of age at marriage. It has been stated in the literature that age at marriage is probably the most important determinant of cumulative fertility in societies where fertility control is least extensive and pre-marital fertility is much lower than marital fertility (Knodel, 1978:492). A strong inverse relationship between cumulative fertility and age at marriage is expected to be found under a regime of natural fertility.

Natural fertility as defined by Louis Henry (1961:81) is marital fertility in the absence of deliberate birth control. He demonstrated that there was a typical age pattern of natural fertility within marriage. However, the level of fertility does vary among different populations. Social factors such as sexual taboos during lactation and periods of separation due to seasonal migration of one of the spouses play a part in determining natural fertility(Henry, 1979:27).

According to Henry, these factors and biological factors control the behaviour of the couple. Thus factors which affect marital fertility but are independent of the number of children already born are not considered as fertility control. On the other hand, fertility is said to be controlled when the behaviour of the couple is bound to the number of children already born and is intended to delay or stop having more births which they do not wish to have.

Many of the factors that determine natural fertility have little direct evidence except age at marriage (Menken, 1979:4). In this section, the pattern of marital fertility is examined taking age at marriage into consideration.

Table 4.8 presents the mean number of children ever born to currently married women aged 15-49 by age at marriage. It is clear that there is a strong negative relationship between age at marriage and cumulative fertility. This pattern of fertility by ages at marriage is apparent in all age-groups[18]. This shows that there is a considerable impact of age at marriage on cumulative fertility. This phenomenon has been documented not only in other Asian contries but also in pre-industrial Europe (Wrigley, 1976, cited by Knodel, 1978:492).

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[18] In a society where fertility control is extensively practised, age at marriage does not always mark the beginning of the childbearing period. Page(1977:85-106) concluded that duration of marriage is also important to include along with age.

TABLE 4.8: MEAN NUMBER OF CHILDREN EVER BORN TO CURRENTLY MARRIED WOMEN AGED 15-49 BY AGE OF WOMAN AND AGE AT MARRIAGE, 1976

	Age at marriage				
Age of woman	<15	15-17	18-19	20+	Total
15-19	0.47	0.20	0.05	-	0.32
	(352)	(324)	(56)		(732)
20-24	1.96	1.42	0.82	0.46	1.45
	(466)	(437)	(180)	(116)	(1199)
25-29	3.61	2.99	2.24	1.41	2.93
	(483)	(323)	(154)	(156)	(1116)
30-34	4.77	4.33	3.62	2.55	4.17
	(347)	(256)	(79)	(125)	(807)
35-39	5.74	5.73	4.89	3.61	5.20
	(235)	(208)	(82)	(134)	(659)
40-44	6.34	6.04	5.50	4.43	5.74
	(218)	(185)	(74)	(128)	(605)
45-49	6.44	6.27	6.14	5.35	6.10
	(120)	(126)	(50)	(87)	(383)
Total	3.59	3.15	2.81	2.83	3.24
	(2221)	(1859)	(675)	(746)	(5501)

Notes: Number inside the parentheses indicates number of women
- indicates no cases

Source: Tabulated from the Nepal Fertility Survey, 1976, Standard Recode, version 1, London: ISI/WFS.

In Table 4.9, we present the mean number of children ever born to currently married women aged 15-34 and 35-49 according to selected background characteristics, controlling for age at marriage. Regardless of age at marriage, women from the Mountains continued to have lower cumulative fertility than those from the Hills and Plains with the exception of those women aged 15-34 who married at the age of 20 years or older. Of those who marry before age 15 the mean number

TABLE 4.9: MEAN NUMBER OF CHILDREN EVER BORN TO CURRENTLY MARRIED WOMEN AGED 15-49 BY SELECTED BACKGROUND CHARACTERISTICS AND AGE AT MARRIAGE FOR 15-34 AND 35-49, 1976.

Background characteristics	15-34 Age at marriage				35-49 Age at marriage			
	<15	15-17	18-19	20+	<15	15-17	18-19	20+
Geographical region								
Mountains	2.41	1.94	1.59	1.45	5.72	5.51	5.50	3.83
	(91)	(103)	(32)	(38)	(46)	(57)	(14)	(30)
Hills	2.74	2.04	1.70	1.44	6.24	6.32	5.57	4.41
	(765)	(675)	(250)	(205)	(258)	(266)	(114)	(216)
Plains	2.76	2.14	1.67	1.58	6.08	5.67	5.17	4.36
	(768)	(541)	(177)	(153)	(268)	(194)	(78)	(100)
Ethnicity								
Mongoloids	2.72	2.17	1.85	1.52	6.46	6.32	5.97	4.25
	(1648)	(375)	(182)	(169)	(96)	(148)	(88)	(165)
Brahmins	2.47	1.61	0.86	1.64	6.53	6.30	2.00	4.38
	(273)	(128)	(28)	(14)	(90)	(37)	(4)	(16)
Others	2.73	2.08	1.63	1.44	5.94	5.77	5.11	4.45
	(1116)	(834)	(258)	(213)	(384)	(333)	(111)	(168)
Religion								
Hindu	2.74	2.08	1.68	1.49	6.12	5.99	5.41	4.46
	(1522)	(1226)	(421)	(360)	(529)	(480)	(184)	(298)
Non-Hindu	2.45	1.89	1.56	1.46	6.21	5.80	5.52	3.65
	(124)	(112)	(48)	(37)	(44)	(39)	(21)	(51)
Education of woman								
No schooling	2.75	2.07	1.68	1.49	6.11	5.99	5.41	4.35
	(1560)	(1245)	(433)	(372)	(572)	(511)	(206)	(345)
Some scholing	2.10	1.90	1.61	1.57	-	-	-	-
	(83)	(92)	(33)	(21)				
Work status of woman								
Not working	2.77	2.10	1.71	1.57	6.10	5.76	4.90	4.08
	(1117)	(705)	(217)	(162)	(411)	(296)	(104)	(159)
Working	2.60	2.03	1.60	1.42	6.17	6.24	5.93	4.56
	(531)	(632)	(249)	(233)	(162)	(222)	(102)	(190)
Education of husband								
No schooling	2.89	2.27	1.74	1.53	6.20	6.08	5.41	4.42
	(1033)	(824)	(314)	(283)	(463)	(441)	(168)	(291)
Primary	2.53	1.76	1.54	1.16	5.59	5.21	5.00	3.80
	(332)	(284)	(99)	(70)	(61)	(39)	(19)	(25)
Middle +	2.32	1.67	1.48	1.80				
	(283)	(232)	(56)	(44)				
Work status of husband								
Farming	2.80	2.08	1.71	1.59	6.18	6.19	5.48	4.37
	(1181)	(949)	(338)	(319)	(452)	(412)	(166)	(290)
Non-farming	2.66	2.23	1.62	1.06	5.84	5.26	5.37	4.16
	(368)	(298)	(111)	(66)	(99)	(88)	(35)	(50)

Notes: Number inside the parentheses indicates number of women.
- indicates no cases or too few cases

Source: Tabulated from the Nepal Fertility Survey, 1976, Standard Recode, Version 1, London: ISI/WFS.

of children is the same for the Hills and Plains. However, women aged 35-49 from the Hills tend to have slightly more births than those from the Plains among those marrying between the ages 15 and 19. In all these three regions, the prevalence of breastfeeding is universal and the mean duration of breastfeeding is equally long[19]. The pattern of lower fertility in the Mountains than in the Hills and Plains might be due to three reasons. First, it has been noted by Gorer (1967:174) in his Himalayan village study that, of the fifty-six married women aged more than 20 years, eighteen were completely sterile. He indicated that a high incidence of sterility could be due to a genetic factor rather than disease such as gonorrhoea. In the Hills, Macfarlane (1976:236) did not encounter any evidence regarding such a disease being widespread in his community. Nevertheless, he did point out that dietary deficiency might have caused low fecundity. Worth and Shah (1969:60) found in their scientific medical research in Nepal that gonorrhoea and, to a lesser degree, syphilis were widespread throughout the country at the time of the survey, in the early 1960s. They also noted that the prevalence of these diseases was higher in the Mountains than in the Hills and Plains. The second reason is the incidence of remarriage. It is reported that the younger brothers in the Mountains have a right to their older brother's widow (Bista, 1972:164). Therefore, a woman in the Mountains has a higher probability of having a husband even when her first husband dies. In many instances, she becomes a widow in her late thirties or early

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[19] Mean length of breastfeeding in the last closed interval is 16 months in the Mountains, 19 months in the Hills and Plains (Ministry of Health, 1977:Table 4.1.4B).

forties[20]. Immediately following the death of her first husband, she will become the wife of her husband's brother. The third reason which may have a greater impact on marital fertility is a long period of separation between spouses due to the nature of their occupation.

The possible reasons that were given above, however, do not explain the fertility differences between the Hills and Plains. In an earlier study (Tuladhar et al., 1982:83), it was argued that there may be three reasons why the Hills have higher marital fertility than the Plains: (1) among Hill women, the shortest intervals occur between births of higher parities; (2) infant mortality and child mortality are higher in the Plains than in the Hills; infant mortality is higher among mothers in the older age-groups in the Plains; and (3) the rate of foetal wastage was found to be higher in the Plains.

When age at marriage is controlled, fertility differences between Mongoloids and Brahmins almost disappear among the older women (35-49). However, among these women, the category 'other' still continue to have fewer births than Mongoloids and Brahmins except for those marrying late, 20 years or above. Among younger women (15-34), Brahmins have the lowest cumulative fertility at all ages at marriage except for those who married at ages 20 years or above.

The age pattern of Brahmins' fertility seems to suggest that the changes in law that allow remarriage have affected the Brahmins' marriage pattern. For other than Brahmin widows remarriage has not been strictly unacceptable in Nepal even before the law was changed.

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[20] The mean age at widowhood was 38.8 years in 1961 and 40.0 years in 1971 for women up to the age of 50 years (Tuladhar, et al., 1977:27).

However, data relating to prevalence of widow remarriage are not available to prove this conjecture. Another reason, as discussed earlier, could be related to the poor health condition among older women when they were at ages 34 years or less.

Differences in marital fertility by type of religion seem to have disappeared once age at marriage is controlled except among those women aged 35-49 marrying at the age of 20 years or above. Women with some schooling tend to have slightly fewer births than women with no schooling. The effect of education of woman on cumulative fertility seems to be highest among women aged 15-34 marrying at younger ages and its effect declines with an increase in age at marriage. For the same women aged 15-34, fertility differential by work status of women has disappeared when age at marriage is taken into account. Unlike among younger women (15-34), older women aged 35-49 who are in the work force have higher marital fertility than those not in the workforce. It is to be noted that the overwhelming majority of the women who are in the work force are engaged in farm work which demands manual labour. On the other hand, those who are not working could be better off economically or their husbands are better educated and have higher social status.

Husband's education seems to have a relationship with cumulative fertility. Women whose husbands have no schooling have higher mean number of children ever born than those women whose husbands have had some schooling regardless of age at marriage[21]. Among women aged 15-34, work status of husband shows no effect on fertility except for

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[21] The mean number of children ever born reported by those women aged 15-34 marrying at ages 20 years or above is unexpectedly higher, this could be due to small sizes or reporting error.

those marrying at ages 20 years or more. However, women aged 35-49 whose husbands are in farm occupations have slightly more births than women with husbands in non-farm occupations.

The preceding analysis, which takes age at marriage into consideration, revealed that the mean number of children ever born differs significantly[22] according to geographical region, ethnicity, work status of woman, education of husband and work status of husband among older women (35-49). However, the relationships established between each single independent variable and cumulative fertility are to be taken as preliminary results because the independent variables are intercorrelated. In order to study the effects of any particular independent variable on marital fertility the effects of all other variables must be statistically controlled. Multiple Classification Analysis (MCA) technique is applied for that purpose.

Results obtained with the use of the MCA technique are useful when there is no significant interaction between independent variables. Thus, the first task will be to test for interactions between independent variables. One way of minimizing the problem of interaction is to run MCA in sub-groups. Here, analysis is carried out for those who are aged 15-34 and 35-49 separately.

Five independent variables (geographical region, ethnicity, work status of women, education of husband and work status of husband) are

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[22] Analysis of variance results indicated that cumulative fertility differs significantly at below five percent level according to geographical region and education of woman among women aged 15-34. See Appendices 4.4 and 4.5.

used as factors and age and age at marriage as covariates[23] in the MCA to check for interaction. Among all these independent variables several two-way interactions were found to be significant at five percent level (see Appendices 4.6A and 4.6B). In all the interactions, 'ethnicity' is interacting with geographical region as well as with work status of woman and education of husband. To minimize the interaction effect, the strongest interaction, which is between geographical region and ethnicity, is considered a new composite variable which will make other interactions insignificant. However, without knowing how the interaction has occurred, it would be difficult to reduce its effect. One way of dealing with this kind of problem[24] is to take a difference from the grand means with interactive model and with additive model. The mathematical part is shown in Appendix 4.7. Differences in deviations between the two models are plotted in Figure 4.2. As we can see from Figure 4.2, most of the points are in the normal pattern except the Mongoloids living in the Plains who have unexpectedly high fertility. There are 42 women of this type in the whole sample.

These 42 women are no different in many characteristics compared to the rest of the population. However, it is noted that they have on an average three times more wasted pregnancies than the rest of the women. The mean number of children ever born in the past five years prior to the survey is slightly more than for the rest of the women:

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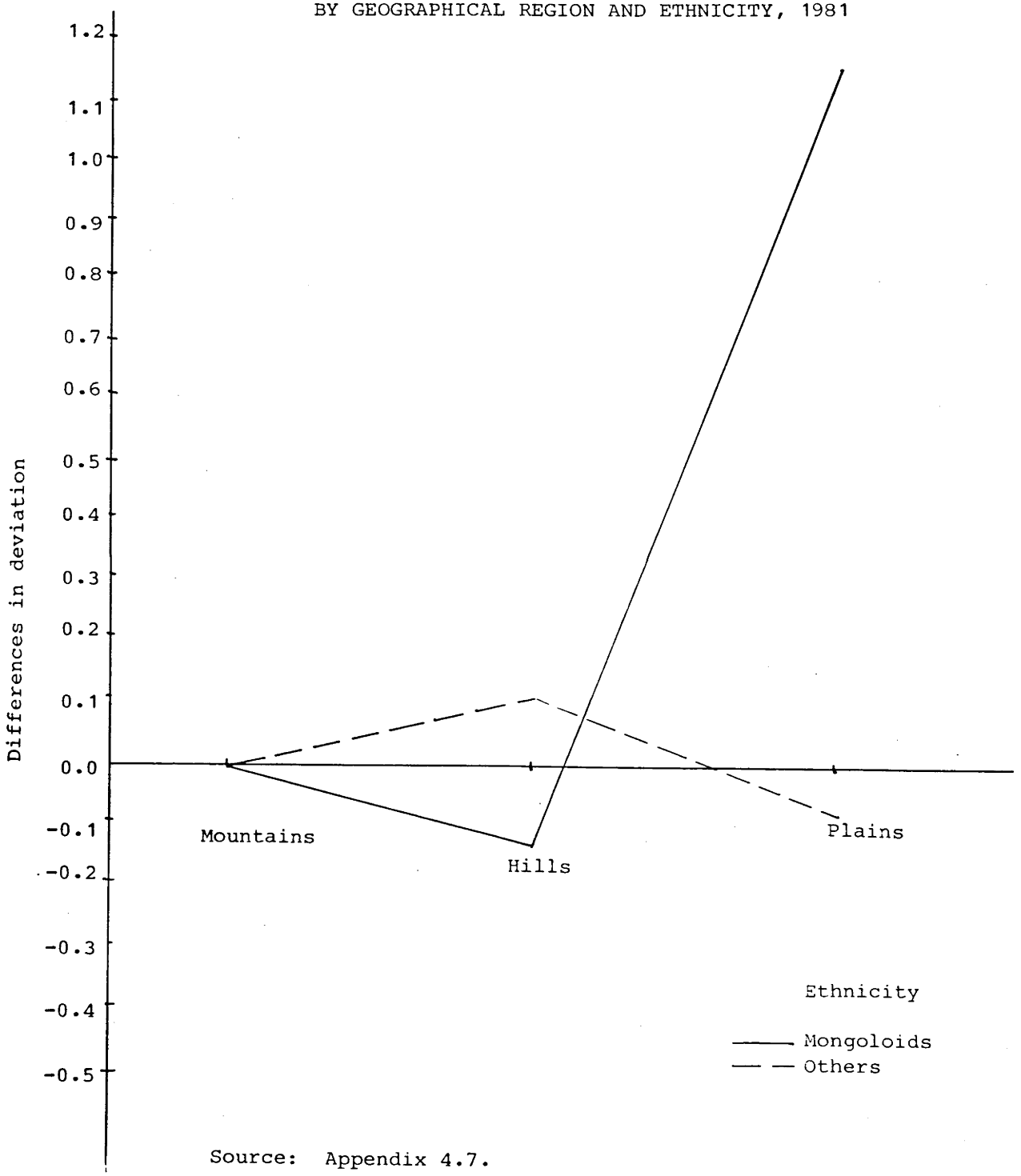
[23] Squared age of woman and squared age at first marriage were also used as covariates in addition to age of woman and age at first marriage for linearity problem, but Appendix 4.6B shows that the squared terms are not significant. Thus, for the further analysis, the squared terms are ignored.

[24] This technique was advised by Professor Thomas Pullum of the University of Washington in personal communication.

FIGURE 4.2: DEVIATIONS BETWEEN ADDITIVE AND INTERACTIVE MODELS BY GEOGRAPHICAL REGION AND ETHNICITY, 1981



Source: Appendix 4.7.

1.2 per woman versus 0.8 per woman. They also have shorter open birth intervals and the proportion of exposed women is slightly higher. Interestingly, almost half of these women knew an efficient method of contraception whereas this proportion is substantially lower for the rest of the women in the survey (see Appendix 4.8).

In order to avoid the interaction effect, it is essential to remove these women from the analysis. Besides, the small number of women in this group will have no significant effect on our result.

Table 4.10 shows the deviation from the grand mean number of children ever born, unadjusted, adjusted for all other independent variables and adjusted for all other independent variables and covariates[25]. The eta value presented for each independent variable indicates the bivariate linear regression of the dependent variable on the factor. The beta value represents the standardized partial-regression coefficient controlling other variables. R-square represents the proportion of variation in fertility explained by the additive effects of all variables considered. It is to be noted that socio-economic variables explain only 1.4 percent of variation in the cumulative fertility. Age and age at marriage explains about 11.1 percent.

The MCA results presented in Table 4.10 clearly indicate that differences in cumulative fertility observed earlier persisted among different groups. Unadjusted and adjusted deviation from the grand mean number of children ever born presented according to geographical region is lowest in the Mountains and highest in the Hills. The interesting part of the analysis is that differential fertility by

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[25] Analysis of variance results are presented in Appendix 4.9.

TABLE 4.10: UNADJUSTED AND ADJUSTED DEVIATIONS FROM GRAND MEAN NUMBER OF CHILDREN EVER BORN TO CURRENTLY MARRIED WOMEN AGED 35-49 ACCORDING TO SELECTED BACKGROUND CHARACTERISTICS WITH AGE OF WOMAN AND AGE AT FIRST MARRIAGE AS COVARIATES, 1976.
(GRAND MEAN = 5.60).

Variable + category	N	Unadjusted deviation	eta	Adjusted for independents deviation	beta	Adjusted for independents +covariates deviation	beta
Geographical region *							
Mountains	139	-0.29		-0.36		-0.38	
Hills	821	0.14		0.19		0.14	
Plains	576	-0.13		-0.18		-0.10	
			0.06		0.08		0.06
Ethnicity *							
Mongoloids	443	-0.11		-0.32		-0.06	
Others	1093	0.04		0.13		0.02	
			0.03		0.08		0.01
Work status of woman							
Not working	891	-0.08		-0.05		-0.16	
Working	645	0.12		0.07		0.22	
			0.04		0.02		0.07
Education of husband *							
No schooling	1287	0.07		0.06		0.05	
Some schooling	249	-0.37		-0.30		-0.25	
			0.06		0.05		0.04
Work status of husband *							
Non-farming	261	-0.35		-0.33		-0.32	
Farming	1275	0.07		0.07		0.07	
			0.06		0.06		0.05
Multiple R squared					0.014		0.125
Multiple R					0.116		0.354

Source: Analysis based on the Nepal Fertility Survey, 1976, standard recode,version 1, London: ISI/WFS.

geographical region widens when other independent variables are controlled. It narrows, again, when age and age at marriage are added to the model. This pattern is also reflected by the values of eta and beta. This type of fluctuation effect is more noticeable with the ethnicity variable. Unadjusted mean number of children ever born shows that there is very little difference in marital fertility by ethnicity. When all other independent variables were introduced in the model, the effect of ethnicity on fertility increased. However, the effect disppeared once age and age at marriage were controlled along with other independent variables. This pattern of fertility differences by ethnicity is also shown by the changing values of eta and beta.

Unlike other independent variables, the effect of work status of women on marital fertility has become stronger once age and age at marriage were considered along with other independent variables in the model. Mean number of children ever born, adjusted for all other independent variables and covariates, according to work status of women supported our earlier finding that working women, indeed, have higher marital fertility than non-working women.

With the introduction of all other independent variables, the effect of husband's education on cumulative fertility decreases slightly. Its effect, further, decreases with the addition of age and age at marriage in the model. However, an inverse relationship between education of husband and cumulative fertility continues to exist even when all other independent variables and covariates are taken into consideration.

Unlike other independent variables considered in this analysis, the effect of husband's work status persists whether or not other variables are taken into consideration. The value of beta remains the same as before after introduction of all other variables.

4.4.2 CURRENT FERTILITY

Mean number of children ever born in the last five years prior to the survey to currently married women aged 15-49 who have been married for at least five years provides an index of current fertility which is also free from truncation bias. The mean presented in Table 4.11 by age group would give us age-specific fertility rates.

In contrast to the findings on differential fertility based on cumulative fertility, the current fertility does not vary much according to different background characteristics except for husband's education and work status (Table 4.11). It is not uncommon to find little effect on current fertility by these factors. The factors that influence a woman to have a child in a particular time-period are likely to be different from those that affect the cumulative fertility. Behaviour factors such as contraception, breastfeeding and abstinence might have more effect on current fertility. The decision whether to have an additional child may depend on the number of surviving children a woman already had. As we have mentioned earlier, because the practice of breastfeeding is almost the same for all groups in Nepal, its effects will not differ. The effects of use of contraception will be presented in Chapter 8.

TABLE 4.11: MEAN NUMBER OF CHILDREN EVER BORN IN THE FIVE YEARS PRECEDING THE SURVEY TO CURRENTLY MARRIED WOMEN AGED 15-49 WHO HAVE BEEN MARRIED AT LEAST 5 YEARS BY AGE OF WOMAN AND DIFFERENT BACKGROUND CHARACTERISTICS, 1976.

Background characteristics	Age of woman								Total Marital fertility rate
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total	
Geographical region									
Mountains	0.500	1.344	1.455	1.277	1.312	0.740	0.441	1.160	6.569
	(4)	(64)	(66)	(65)	(61)	(50)	(34)	(344)	
Hills	0.638	1.482	1.569	1.433	1.110	0.791	0.308	1.208	6.693
	(58)	(367)	(520)	(400)	(318)	(335)	(195)	(2193)	
Plains	0.824	1.536	1.639	1.486	1.130	0.704	0.329	1.266	6.824
	(74)	(345)	(451)	(327)	(270)	(216)	(152)	(1835)	
Ethnicity									
Mongoloids	0.909	1.523	1.567	1.458	1.267	0.826	0.331	0.809	6.971
	(11)	(155)	(270)	(227)	(180)	(190)	(121)	(1154)	
Brahmins	0.800	1.395	1.533	1.190	1.085	0.623	0.200	1.153	6.026
	(20)	(119)	(107)	(79)	(59)	(53)	(35)	(472)	
Others	0.713	1.493	1.608	1.478	1.095	0.742	0.348	1.240	6.764
	(108)	(521)	(668)	(487)	(411)	(357)	(224)	(2776)	
Religion									
Hindu	0.742	1.499	1.587	1.436	1.127	0.755	0.325	1.229	6.729
	(132)	(735)	(948)	(745)	(599)	(546)	(339)	(4044)	
Non-Hindu	0.714	1.312	1.615	1.529	1.259	0.786	0.357	1.213	6.858
	(7)	(61)	(96)	(51)	(54)	(56)	(42)	(367)	
Education of woman									
No schooling	0.705	1.478	1.577	1.456	1.142	0.755	0.330	1.219	6.738
	(129)	(745)	(992)	(767)	(639)	(596)	(379)	(4247)	
Some schooling	1.200	1.560	1.804	1.000	0.668	1.000	0.000	1.412	6.032
	(10)	(50)	(51)	(27)	(12)	(6)	(2)	(158)	
Work status of woman									
Not working	0.837	1.510	1.609	1.437	1.102	0.699	0.289	1.220	6.646
	(104)	(504)	(608)	(467)	(394)	(335)	(239)	(2651)	
Working	0.457	1.442	1.563	1.453	1.193	0.825	0.390	1.239	6.866
	(35)	(292)	(435)	(327)	(259)	(268)	(142)	(1758)	
Education of husband									
No schooling	0.838	1.492	1.588	1.460	1.193	0.784	0.342	1.216	6.859
	(74)	(463)	(711)	(594)	(528)	(508)	(319)	(3197)	
Some schooling	0.655	1.412	1.568	1.344	0.900	0.449	0.217	1.264	5.890
	(55)	(262)	(244)	(128)	(70)	(49)	(23)	(831)	
Work status of husband									
Farming	0.745	1.513	1.623	1.478	1.174	0.801	0.345	1.242	6.934
	(106)	(538)	(761)	(615)	(512)	(493)	(307)	(3332)	
Non-farming	0.947	1.466	1.513	1.385	1.017	0.565	0.262	1.214	6.208
	(19)	(208)	(240)	(148)	(115)	(92)	(65)	(887)	
Total	0.741	1.485	1.590	1.442	1.138	0.756	0.328	1.228	6.739
	(139)	(796)	(1045)	(796)	(653)	(603)	(381)	(4413)	

Notes: Number inside the parentheses indicates number of women.
The method of calculating total marital fertility rate is given in the text.
Number of women may not add up to total because of 'not reported' and 'don't know' cases.

Source: Tabulated from the Nepal Fertility Survey, 1976, Standard Recode, version 1, London: ISI/WFS.

A summary measure of current fertility (Total marital fertility rate) suggests that the greatest difference is found by education of husbands. Total marital fertility rates are 6.9 for women whose husbands have no schooling as against 5.9 for those whose husbands have some schooling. I would like to point out here that this total fertility rate used here differs from the conventional one in four ways: five-year vs. one-year reference period[26]; exclusion of recently married couples; exclusion of those under age 20; and reference to current age rather than age at event. Total marital fertility rate equals the sum of the means for each five years age group above age 20.

If we look at the age-specific marital fertility pattern presented in Table 4.11, it follows the natural fertility pattern. The marital fertility is highest at early ages, particularly at ages between 20 and 29, and declines very slowly with an increase in age. As expected under a regime of natural fertility, age-specific marital fertility in Nepal does not differ by age at marriage (Table 4.12). But it is worth noting that current fertility of those who marry later is higher, thus reducing the expected downward effect on completed family size.

So far, the analysis of current fertility was carried out taking only age and age at marriage into consideration. Though we find that differences in current fertility by each independent variable are very

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[26] Births in the last year can usually have a problem of reference error. As a result, it can give us a false decline in fertility. In addition, the total marital fertility rate is calculated based on the women aged between 20 and 49 because the small number of women of ages 15-19 can provide a wrong picture on the age pattern of fertility. Similar rates were computed by Knodel(1978:491) in the fertility differentials of pre-industrial Germany to observe the age-pattern of marital fertility.

little, one can argue that the finding might be different because of the fact that all independent variables are interrelated. Therefore, I proceed to examine fertility differences by each independent variable controlling for all other independent variables and covariates with the multivariate approach.

As with completed fertility, Multiple Classification Analysis (MCA) technique is employed for two sub-groups of currently married women (age-groups 15-34 and 35-49) to study fertility differentials.

TABLE 4.12: MEAN NUMBER OF CHILDREN EVER BORN IN THE FIVE YEARS PRECEDING THE SURVEY TO CURRENTLY MARRIED WOMEN AGED 15-49 WHO HAVE BEEN MARRIED FOR AT LEAST 5 YEARS BY AGE OF WOMAN AND AGE AT MARRIAGE, 1976

	Age at marriage			
Age of woman	<15	15-17	18 +	Total
15-19	0.741	-	-	0.741
	(139)			(139)
20-24	1.509	1.431	1.636	1.485
	(466)	(297)	(33)	(796)
25-29	1.627	1.567	1.544	1.590
	(483)	(323)	(239)	(1045)
30-34	1.366	1.481	1.529	1.442
	(347)	(256)	(193)	(796)
35-39	1.000	1.260	1.171	1.138
	(235)	(208)	(210)	(653)
40-44	0.619	0.730	0.930	0.756
	(218)	(185)	(200)	(603)
45-49	0.250	0.310	0.415	0.328
	(120)	(126)	(135)	(381)
Total	1.228	1.252	1.194	1.228
	(2008)	(1395)	(1010)	(4413)
Age standardized	1.181	1.209	1.273	

Notes: Number inside the parentheses indicates number of women.
- indicates no cases.
Standard used here was distribution according to age at marriage.

Source: Tabulated from the Nepal Fertility Survey, 1976, standard recode, version 1, London: ISI/WFS.

In order to avoid losing any information, the selected husband's and woman's characteristics (education and work-status) are combined. Thus, education and work-status variables represent the characteristics of both husbands and wives. Including these two variables, there are five independent variables: geographical region, religion, ethnicity, education[27] and work-status[28]; and two covariates, age of woman and age at marriage. Examination of interaction and treatment to delete the effect of interactions is done in the same manner as was described in the earlier section (4.4.1).

The MCA results for 15-34 women suggest that there is no significant difference in current fertility among different sub-groups in Nepal except by geographical region(Appendix 4.10). On an average, the Mountain women aged 15-34 have 0.18 fewer births compared to overall fertility (Appendix 4.11). Again, the adjusted deviations from the grand mean are only -0.02 and 0.05 for the Hills and the Plains respectively when all other variables are controlled. The only reasons for lower fertility in the Mountains seem to be the higher incidence of secondary sterility and long separations between husband and wife, which were mentioned earlier.

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[27]The combined education variable has four categories. But the categories are regrouped further, into two groups because two out of four categories have very small numbers of women. The final education variable has two categories: (1)both spouses having no schooling (2)at least one of the spouses has some schooling.

[28] There are four categories in the combined work-status variable. They are: (1)non-working woman - husband working on farm (2)non-working woman - husband working in non-farm (3)working woman - husband working in farm (4)working woman - husband working in non-farm.

Differences in current fertility among women aged 35-49 are found to be significant for education and work-status only(Appendix 4.12). When all other variables are controlled, the fertility is lower among women with at least one of the spouses having some schooling. The adjusted deviation from the grand mean is -0.14 for women with at least one of the spouses having some schooling(Appendix 4.13). The unadjusted eta value is 0.07 which is unchanged when effects of other variables are introduced. With regard to work-status, working women whose husbands are engaged in non-farm occupation have the lowest fertility. Adjusted fertility of this group of women is low by 0.17 births compared to the overall mean. Unlike education, the effect of the work-status variable on fertility is reduced when other variables are taken into consideration. Unadjusted eta is 0.10, it reduces to 0.08 when adjusted for other independent variables and it further reduces to 0.06 when covariates are added with independent variables.

CHAPTER 5

POPULATION AND FAMILY PLANNING PROGRAMME

5.1 INTRODUCTION

It was noted in the Nepal Country Economic Memorandum of the World Bank(1978) according to UNFPA(1979) that there was little economic growth during the Fifth Plan period (1975-1980). Nepal's GNP per capita in 1976 was estimated to be around US$ 120[1]. The lack of economic growth was largely due to stagnant agricultural production. Nepal's per capita income would continue to fall unless a breakthrough in raising agricultural productivity was achieved and new opportunities in industry were identified. The tourist industry has contributed to the GDP, but its contribution has been minimal. It is expected that Nepal which has been a food-exporting country will be a net importer of food by 1984/85(World Bank, 1983:8). The shortage of food is severe in the Hills where an average family produces only enough food for 225 days per year. At the same time the World Bank figures show that there is a surplus of food in the Plains.

There is a widespread problem of poor health in the population of Nepal, one of the underlying problems being malnutrition. More than 90 percent of the rural population drink polluted water and infectious diseases are widespread. The UNFPA Mission on Needs Assessment for Population Assistance identified two serious shortcomings in the health care delivery system in Nepal (UNFPA, 1979:12). The first one

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[1] The Asian Development Bank estimated the figures of per capita GNP in American dollars as follows: 1977- $110, 1978- $120, 1979- $130, 1980- $140, and 1981- $160.

was insufficient emphasis on the importance of proper nutrition, unpolluted water, and education in hygiene and sanitation under the preventive health programme. The second one had to do with uneven distribution of the health budget, a large proportion of which is spent on providing hospital based services that serve only the urban population.

The growing problem in economic and health conditions is exacerbated by the rapidly growing population. If population growth can be checked by cutting births, maternal and child health and economic standards stand a better chance of being simultaneously improved.

In 1965, the late King Mahendra of Nepal declared: 'In order to bring equilibrium between the population growth and economic output of the country, my government has adopted a policy of family planning.' On Human Rights Day, December 10, 1966, the King of Nepal signed the United Nations Declaration on Population of 1966(Population Council, 1967).

5.2 POPULATION POLICY

Development planning in Nepal was started as early as the mid-1950s. The First Development Plan was prepared for the period 1956-1961, and the second plan for the period 1961-1965. In both plans, there was no specific population policy other than a resettlement policy to absorb the increasing population in the Hills (UNFPA,1979:46). Attention was given to the problem of population growth only after the preparation of the Third Plan (1965-1970), in which a chapter was devoted to 'Population and Manpower', where the

population growth and its various consequences were clearly discussed (HMG of Nepal, 1965:48-55). In addition, the impact of health and family planning programmes on population growth was stressed in the plan, and provision was made for the delivery of family planning services.

The Fourth Development Plan (1970-1975) was even more clear in its objectives in relation to population policy. For the period 1970-1975, six areas were given high priority, the fifth of which concerned the effective use of manpower resources and population control. It stated:

> While setting the goals of economic development, it has become necessary to consider the effective utilization of available manpower resources and the control of population growth within desirable limits. Although the rate of growth of population in Nepal appears to be low in comparison with the growth rate in many countries, it is not a desirable rate in relation to available resources, especially cultivable land. The family planning programme will help improve the situation and thereby uplift the standard of living of the people.(HMG of Nepal, 1970:3).

The chapter on 'Manpower and Population' stressed two requirements for bringing about a substantial change in the birth rate (HMG of Nepal, 1970:23). The first was to bring changes in the economic and social conditions, cultural patterns and aspirations of the common man. The second point was to create an institution to implement a family planning programme.

The Fifth Development Plan (1975-1980) devoted an entire chapter to population policy. The plan stated that

> optimum utilization of manpower, consistent with the aims of broader economic growth and faster rise in the standard of

> living of the masses, demands a pattern of distribution of population in keeping with the present and future geographical distribution of the physical resource endowments of the country. (Lohani, 1976:22).

In order to realize these objectives, the Government of Nepal adopted the following policies for the Fifth Plan (1975-1980)(HMG of Nepal, 1976:42)[2]:

> 1. Achieve perceptible reduction in crude birth rate through such indirect but broad and basic determinants as social, economic, cultural, and educational development and reforms, as well as through direct antinatalist and preventive programs of family planning and maternity and child health care;
>
> 2. Control the flow of immigration into the country to reduce this flow to insignificance;
>
> 3. Organize the internal migration from the hills to the Terai, and also from rural to urban areas, in a systematic way and on the basis of a set program;
>
> 4. In order to achieve an optimum spatial distribution of population, it is highly desirable that population growth in Nepal should have direct correspondence with the differing resource endowments of different geographic regions. Especially, more attention should be focused on the necessity of increasing the density of population in the Western Terai and particularly in the Far Western Terai;
>
> 5. From the regional development considerations, it is desirable to develop small urban centers in hitherto unurbanized regions. Necessary civic facilities should be provided in the centers selected for such planned urbanization.

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[2] An English version is cited from G. P. Lohani (1976), 'Search For a Population Policy', A proceeding of Conference on the Implementation of Population Policies, jointly sponsored by Population Policies Coordination Board, Nepal, Ministry of Health, Nepal and the University of California, Berkeley, FP/MCH Project in Nepal, pp.18-23.

The Sixth Development Plan (1980-1985) discussed the impact of population growth on different sectors, particularly on agriculture, forestry, labour force, education, health and urbanization. The plan stated as its two population objectives: 1. The annual population growth rate of 2.3 percent will be regulated and pre-requisites to bring down the population growth will be created in the Sixth Plan, and 2. Problems of population distribution and migration will be tackled (HMG of Nepal, 1980:715). The plan adopted the following policies: (1) to introduce a family planning programme with particular emphasis on permanent methods in rural areas where fertility was high, (2) to intensify economic activities in the Hill areas in an effort to regulate the movement of population, and (3) to popularize the family planning programme among the people at large by adequate provision for publicity and extension of services.

The Family Planning and Maternal Child Health Project (FP/MCH Project), which is under the Ministry of Health, was in charge of coordinating and implementing population policy and providing family planning information and services until 1975. The Fifth Plan (1975-1980) called for the development of a Population Policy Coordination Board (POPCOB) under the National Planning Commission (NPC) in 1975. The POPCOB was responsible for coordinating the work of the various ministries with matters pertaining to population changes. The POPCOB was chaired by a member of the NPC and its members were representatives from various ministries, such as Health, Law, Home Affairs, Panchayat and Agriculture and representatives from the Tribhuvan University, Women's organization, the Family Planning and Maternal Child Health Project. By the end of 1977, however, it had become apparent that the POPCOB had been unable to meet its

objectives (UNFPA, 1979:48).

The Government of Nepal instituted the National Commission on Population (NCP) chaired by the Prime Minsiter in 1978. Under this commission, four committees[3] were formed. After a few months, the position of chairman of the NCP was given to the Minister for Home and Panchayat by the government. The functions of the commission were as follows[4]:

> a. Issuance of policy directives from different activities that influence birth rate, death rate, migration, immigration, employment, size of population and population behaviours;
>
> b. To study or to cause to study the problems specified under (a) and thereafter bring into publication such reports of studies;
>
> c. Necessary surveys to be organised and held for survey of the existing population situation;
>
> d. Study of activities influencing the population to be undertaken by the ministries, departments and other organizations who are related with the population programmes, preparation and execution of plans and programmes and periodical assessment and review of the same;
>
> e. Contacts to be established and maintained with international organizations agencies(sic) in regard to population policies and activities and to work as National Centre in this field;
>
> f. Launching of a pilot project in the form of experiment or on experimental basis in a particular place, area or location community(sic), institution or a class of society

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[3] The four committees were: (1) Family Planning Services, (2) Population Information and Education, (3) Population Distribution, Citizenship and Migration, and (4) Population and Law.

[4] Cited from the 'Report of Mission on Needs Assessment for Population Assistance', UNFPA Report No.21, 1979, pp. 129.

in connection with finding out factors contributing to faster growth of population;

g. Arrangement of training programmes to civil servants and other workers to implement the projects under population plan and policies;

h. Execution of population policies, search and recommendation for factors providing for necessary encouragement; and

i. Other necessary activities to be caused to be undertaken for the successful implementation of population policies.

As time passed, it was soon realized that the NCP did not progress in its activities other than the health based programmes. This was largely due to its administrative structure. The NCP proposals must be submitted to the Government through the Ministry of Health. As a result, it received a low priority within the Ministry of Health.

The NCP was reorganized again in 1979. The Prime Minister, again, chaired the NCP. The position of vice-chairman was given to the vice-chairman of the National Planning Commission. The secretariat of the NCP was kept under the secretariat of the National Planning Commission. The new structure of the NCP provided it with its own administrative staff. Technical staff were drawn from various ministries to work on specific areas of research.

5.3 IMPLEMENTATION OF POPULATION POLICIES

As we have noted, Nepal has a comprehensive population policy to bring down the level of fertility. The Family Planning Programme is expected to affect fertility directly, whereas a number of socio-economic measures may affect fertility indirectly.

In the Sixth Development Plan (1980-1985), the Integrated Rural Development approach is the basic approach adopted to meet the plan objectives. Under this approach, steps are to be taken to provide at least minimum human needs, particularly education, health(including training for Ayurvedic and traditional healers), and provision of safe drinking water, housing and development of programmes to provide at least minimum income. All the programmes will have indirect impact on lowering fertility if they are successfully implemented.

5.3.1 SOCIO-ECONOMIC MEASURES

5.3.1A POPULATION DISTRIBUTION

A resettlement programme was one of the earliest measures taken to tackle the population problem in the Hills[5]. In 1954, the government of Nepal allocated areas for relocation of the victims of monsoon floods and landslides in the Hills. The Rapti Valley Development Programme was launched in Chitwan district in 1956. The programme aimed to relieve population pressure in some neighbouring areas, rehabilitate the landless peasants, and solve the food deficit in the Kathmandu valley. The programme did not make progress until the malaria eradication programme was launched in 1958. By the end of the First Five Year Plan(1960), approximately 28,000 hectares of land were distributed among 5,233 families. However, this programme failed

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[5] Much of the information in relation to resettlement programmes is based on an article: Kansakar(1979), 'Internal Migration and Population Distribution in Nepal', in NEPAL: REPORT OF MISSION ON NEEDS ASSESSMENT FOR POPULATION ASSISTANCE, Report no. 21, UNFPA, New York, pp.137-152.

to meet its objectives for two reasons: (1) malfeasance in the distribution of land, and (2) reckless deforestation by large-scale migration of the Hill people to the Terai (Plain) and inner Terai in quest of cultivable land for resettlement.

The Government established the Nepal Resettlement Company in 1964 based on a feasibility study report of 1962. The company stated its policies as follows:

1. to bring fallow and uneconomic forest lands under cultivation through resettlement;

2. to reduce the heavy pressure of population on cultivated land in the hills;

3. to remove the forest encroachers from protected forest areas and resettle them elsewhere to conserve the forests;

4. to protect the steep and landslide-prone land from cultivation;

5. to conserve the natural vegetation of the catchment areas of irrigation, drinking water, hydro-electicity, and other projects; and

6. to distribute the excess land available through the implementation of the Land Reform Programme.

In the resettlement project areas, the company made provision to sell land at a nominal price. In addition, more people from the Hills were attracted to the scheme because there were social and economic facilities, such as roads, health posts and schools. As a result, the company could not cope with the demands for land, and people who could not obtain land under the project scheme encroached on the forests in and around the project areas. In the end, the company could not function according to the objectives stated above.

When the Government established the Resettlement Department at the beginning of 1969 under the Ministry of Food and Agriculture to handle a large scale resettlement programme, the company was kept under this new department. It was pointed out that the Nepal Resettlement Company still was not effective due to the lack of necessary technical manpower (Kansakar, 1979:146).

5.3.1B POPULATION EDUCATION AND COMMUNICATION

The Ministry of Education revised the school curriculum in 1978, to introduce population information in various subjects up to secondary level. For grades 4-7, the topic of causes of rapid population growth was introduced in social studies. Grades 8-10 students are required to study considerably more population-related topics. Physical development of the child, child care, and childhood diseases and nutrition are included in the subject of home science. In addition, the health curriculum includes topics on family life and human reproduction. All grade 10 students study topics on pregnancy and family planning.

Though population education has been formally included in the school curriculum, there is a lack of trained teachers. It is estimated that out of 23,000 primary school teachers (grades 1-3), only 37 percent have ever received any training; of 8,000 lower secondary teachers (grades 4-7) only 39 percent have ever been trained; and of 5,000 secondary teachers (grades 8-10), only 50 percent were trained as of 1979.

At the university level, the Tribhuvan University does not have a population course leading to a diploma or degree in demography, but population courses are available for students studying economics, geography and law.

With respect to non-formal population education, a few organizations have population education programmes. Most of those that exist are new and are supported by UNFPA grants based on the recommendations submitted by the UNFPA Needs Assessment Mission to Nepal in April 1979. There are currently 19 different governmental and non-governmental agencies involved in Family Planning and Population Education programmes (see Table 5.1). The Department of Agriculture and the Agriculture Development Bank integrated the Family Planning and Population Education programmes into their agricultural education programmes. The Department of Labour with the help of the International Labour Organization and the Nepal Labour Organization conducts workshops and seminars on population and family planning for volunteers who distribute contraceptives in industrial districts. Employees who undergo sterilization get special benefits such as a few days of leave with pay after sterilization.

Co-operatives are widely scattered throughout the country, although the majority are in the Plains. There were 690 primary co-operative societies with more than 900,000 members in 1979. The co-operative societies operate one co-operative training institute in Kathmandu. Members of co-operatives are trained in the training centre and in field situations. Members are informed on topics such as agriculture, health and family planning. Recently, a short population course has been introduced into their regular training

TABLE 5.1: POPULATION AND FAMILY PLANNING PROGRAMMES IN NEPAL.

Agency	Media and Method
1. National Population Commission	Formulation of population policies, research and evaluation, publications, and training.
2. Nepal Family Planning Maternal Child Health Project Project	Field Workers (1700), printed materials, radio, movie, video, exhbition, trainings, workshops, sterilization campaign, contraceptives distribution, child and mother's health care services, research and evaluation.
3. Deapartment of Health (Integrated Health Project)	Radio, printed materials, field workers (1522), health care, integrating family planning services.
4. Family Planning Association of Nepal	Printed materials, movie, exhibitions, radio, field workers (101), training, workshops, seminar, sterilization campaign, services on sterilization and contraceptive distribution.
5. Curriculum Development Center (Ministry of Education)	Workshops and seminars for development and modification on population education, curriculum for higher secondary schools, radio and textbook.
6. Cooperative Training Center	Trainings, workshops/seminars, publications- wall posters, news letters, booklets and pamphlets.
7. Women's Training Center	Trainings, workshops/seminars, teaching materials production.
8. Panchayat Training Center	Trainings, workshops/seminars, teaching materials production.
9. Department of Labour	Workshops/seminars, contraceptives distribution (Industrial Labourers).
10.Nepal Women's Organization	Training and services on family planning (training motivators and distributing contraceptive through them).
11.Mother's Clubs	Training members, distribute contraceptives (only in Dang, Kaski, Bhojpur, Lalitpur).
12.Nepal Red-Cross Society	Motivate people through members group discussions and posters for family planning and sterilization.
13.Youth Clubs	Training, workshops, sterilization camps, distribution of contraceptives (only in Kathmandu, Bhaktapur, Nuwakot, Bara, Parsa, Jhapa, and Kapilvastu).
14.Small Farmers Development Project (Agriculture Develoment Bank)	Posters, flip-charts, cassettes, flash-cards, group trainings, group discussions, dramas (limited to two pilot projects in Nuwakot and Dhanusha).
15.Contraceptive Retail Sales Project	Posters, pamphlets, pictorial, booklets, radio ads, flip-charts, outdoor displays, trainings, seminars, research, evaluation and promotional medias like point of purchase, display materials and commercial distribution of condom and pills through dealers and retailers in existing markets.
16.Department of Agriculture: a. Extension and Training Division	*Field workers (1600) trainings, workshops, field days, farmers seminars, vegetable seed packages distribution.
b. Information Division	*Community listenning centers, radios, cassettes.
17.Small Farmers Development Project (Agriculture Development Bank)	*Radios, cassettees, posters, charts, group trainings, group discussions (only in 8 districts).
18.Ministry of Education: a.CTSDC b.Adult Education	*Textbooks, radio, training of teachers and school supervisors, instructional materials, and training packages, news-letter.
19.Institute of Education, Tribhuvan University	*Teachers' training, radio.

Notes: * indicates that the programmes are in planning stage to integrate Population Education.

Source: New Era (1981), 'Base line study for Population Education Programme in Nepal', Kathmandu, Nepal.

course.

To assist, implement and coordinate population education activities, the Information, Education and Communication (IEC) Division of the FP/MCH Project is acting as the multisectoral population education unit. The IEC Division of the FP/MCH Project is well equipped with trained manpower and sophisticated equipment such as video, printing press, etc.

5.3.1C WOMEN'S PROGRAMMES

The UNFPA Mission on Needs Assessment for Population Assistance expressed an opinion that little attention had been given to programmes for development of women's status. The mission pointed out:

> In all of HMG's administrative machinery there is neither a special division for women's affairs nor even a section in a ministry for dealing with women's issues. As a result, there are practically no staff at present in HMG to initiate, formulate, process, and carry out special projects for women or to integrate women's project components into development programmes.(UNFPA, 1979:90).

The UNFPA mission identified four women's organizations which conduct programmes to uplift women's skills. The first one, which is called Women's Affairs Training Centre, was established in 1956 with the help of the Ford Foundation. During the International Women's Year, 1975, three more such women's training centres were founded in other regions of Nepal. Training is conducted in two settings: institutional and field training.

The second organization is the Nepal Women's Organization which was established with political aims in mind. Its objectives were: (1) to conduct literacy programmes; (2) to provide legal aid services; (3) to develop skill development projects; and (4) to carry out women's family planning projects. It has a branch office in every district and village panchayat.

The third one is the Women's Services Co-ordination Committee which is under the Social Service National Co-ordination Council established in 1977, chaired by the Queen of Nepal. The Committee is responsible for coordinating the activities of various social and other women's organizations and for the promotion of development activities of women.

The fourth organization is the Mother's Club supported by the Red Cross. The type of activities which are carried out by this organization clearly indicates that this programme's goal is in upgrading the skills of women by providing training opportunities for them. In 1979, there was only one club in Kathmandu. It had the capacity to run a nursery school for 90 children, a sewing class for 60 women; an embroidery class for 10 women; a knitting class for 40 women; and a day-care centre for 15 children of the trainees and staff. It provides a certificate on completion of training. It is certain that this programme is quite successful and needed to be expanded. The International Planned Parenthood Federation (IPPF) financed the opening of 20 new clubs in 1979. The UNFPA mission also strongly recommended opening at least one club in each of the 75 districts of Nepal with international assistance.

There are three other organizations which carry community development activities involving women. The Agriculture Department has an agriculture extension programme which engaged 3,000 agriculture assistants at village panchayat level during 1979. This department initiated a pilot project for women in agriculture and agro-based activities. Under this pilot project, wives of agriculture assistants are given training to work as women agriculture assistants. In future, it is planned to integrate population education activities.

The Small Farmers Development Programme produces posters, folders and flip charts relating to food production and family size. The programme created a women's group which carried out a number of income generating activities for women. In 1981, such activities were carried out in eight districts[6].

5.3.2 FAMILY PLANNING PROGRAMME

5.3.2A GOVERNMENT PROGRAMME

At present, there are two government agencies which are involved in providing free family planning services[7]. The Nepal Family

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[6] According to the 1982 UNFPA Report, a mid-term review process started in October 1982 with five sectoral evaluations. The results were to be reported at a review meeting in January 1983(UNFPA, 1983:76). This review report was not available at the time of writing this thesis.

[7] There used to be no direct cash incentives to acceptors until July 1983. According to the Population Headliners of ESCAP, from 16 July 1983 cash incentives for sterilization acceptors, such as labour compensation, will be available in Nepal. According to an IPPF report, the decision forms part of current national policy to expand family planning education and services with emphasis on spacing and sterilization methods (1983:5).

Planning and Maternal Child Health (FP/MCH) Project which is under the semi-autonomous Nepal Family Planning and Maternal Child Health (FP/MCH) Board has a national responsibility to make family planning services and information available to all eligible Nepalese. The Integrated Community Health Services Development Project (ICHSDP) is another agency which is responsible for providing the entire range of basic health services including family planning. The idea of integrated community health services was first introduced in the Fifth Plan (1975-1980), as a policy to provide minimum health services as quickly as possible (HMG of Nepal, 1976:502).

The FP/MCH Board chaired by the Minister of Health sets guidelines for the implementation of the family planning and maternal child health programme in the country. The FP/MCH Project which is administratively under the Ministry of Health spent its initial period integrating FP and MCH activities using health institutions in the Kathmandu valley (Taylor et al., 1972:5). The MCH component was added to the family planning programme for two main reasons: (1) with Nepal's high mortality, politicians felt a greater obligation toward providing services for surviving children than toward preventing future births, and (2) MCH might develop rapport for promotion of family planning among MCH clients, win their trust, and provide an excellent opportunity for family planning motivation.

At present, the FP/MCH Project provides the family planning and maternal child health services in 52 of the 75 districts[8] in three different settings: stationary, mobile and door-to-door. The stationary one is generally attached to a health institution, such as health posts, health centres and hospitals. In addition to the staff of the health institution, the FP/MCH assigns a minimum of two workers to work full time on family planning and maternal child health service delivery. If the FP/MCH centre is attached to a health post, there will be two family planning workers (generally one of each sex). If it is attached to a hospital, there will be as many as five or more workers including one auxiliary nurse-midwife or auxiliary health worker and one public health nurse. The FP/MCH centre attached to a health post distributes condoms and oral pills to those who come to the centre. At the same time, the centre provides maternal and child health services including education on nutrition and environmental health care. The centre attached to a hospital provides additional services, such as sterilization (male and female), IUD and Depo-provera depending upon the availability of trained medical doctors and equipment. All of the FP/MCH workers are required to give follow-up services at acceptors' homes and motivation to potential acceptors within a radius of three miles from the centre. By the end of May 1983, there were 170 FP/MCH centres of this kind. Out of them, 28 were in the Mountains, 97 in the Hills and 45 in the Plains.

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[8] In order to gain the people's participation in running the family planning programme, there is a district level Family Planning and Maternal Child Health Coordinating Committee in each district. The committee is expected to help in the following activities: (1) to draw a tentative programme in connection with the FP/MCH; (2) to mobilize the local resources to run the sterilization camps; and (3) to select village panchayats for a panchayat based centre.

Some of the FP/MCH centres, particularly district offices, operate satellite clinics in nearby areas. In the satellite clinic, distribution of oral pills and condoms, education in family planning, and maternal child health services are offered.

A large part of the country is covered by mobile sterilization camps. The first quarter of the fiscal year (July-September) is generally a period when almost all of the district annual plans are made in consultation with the central office. Each district office makes a plan for a sterilization camp (vasectomy, laparoscopy and mini-laparoscopy) working out the required budget and supplies, and submits it to the central office for approval. Usually, these activities are carried out at the annual district officers' seminar. Camps can be divided into two categories. A laparoscopy or mini-laparoscopy camp is organized by providing staff from the central office where almost all the trained medical doctors are stationed in various hospitals and the FP/MCH central clinic. A vasectomy camp is organized and run by the district personnel. Approximately a week before the camp is to be held, district staff or the central staff conduct motivation and education campaigns. Camps are generally held with the help of local village panchayat members and volunteers from Women's Organization, Red Cross, Youth Club, etc. Generally, every sterilization camp is assisted by the district level steering committee which consists of locally very influential people (Nepal FP/MCH, no date:15). This committee helps in getting people's participation and bringing potential acceptors to the camp site. But there are instances where the previously organized camps were cancelled because of lack of trained medical doctors who would be willing to go to remote villages.

The third setting is the Panchayat Based Centre. The first step in the evolution of the Panchayat Based Centre was the development of the area system in 1972, after it was realized that most villagers were not willing to come to the FP/MCH centre to obtain family planning services (Young, 1975:155). Under an area system, a Family Planning worker spends one or two days per week in a FP/MCH centre and the remaining four to five days in the field area motivating, educating and distributing condoms and oral pills to couples at home.

The FP/MCH Project spent a number of years finding an appropriate way to provide family planning and maternal child health services. The following types of experimental programmes were tested (Gubhaju, et al., 1975:177):

> (1) A village-based field worker approach where the duties of the worker will include in addition to family planning activities (i.e., motivation and distribution of contraceptives) provision of limited immunization and rehydration services in an effort to reduce infant mortality and thus encourage adoption of family planning;
>
> (2) Altered staffing patterns where husband and wife teams and more elderly and mature women are recruited as family planning workers and their performances compared;
>
> (3) An intensive worker approach which will include the utilization of other government extension workers and volunteer women combined with varying levels of mass media and education input;
>
> (4) A commercial distribution of contraceptives approach where selected commercial channels will be utilized to provide contraceptives; and
>
> (5) Approaches which will test selected models of FP/MCH service delivery particularly as they relate to the utilization of manpower in areas of poor communication and difficult terrain.

At the end of the fiscal year 1975/76, 190 panchayat based workers were appointed in selected panchayats. This number was increased to 1,549 workers by the end of May 1983[9]. A panchayat based worker is expected to provide door-to-door service in the following areas:

(1) to maintain a ward register which identifies potential acceptors in his/her village panchayat and date and method of family planning acceptance;

(2) to motivate and educate on family planning;

(3) to provide information on various family planning methods;

(4) to distribute condoms and oral pills;

(5) to distribute RD-Sol(Oral Rehydration Solution) for the treatment of dehydration;

(6) to distribute iron tablets to mothers;

(7) to educate on sanitary hygiene;

(8) to refer sick children and mothers to a health post, health centre or hospital; and

(9) to disseminate information about sterilization camps.

The field level activities are monitored by four regional and 40 district offices. Each regional office is headed by a senior medical officer who is assisted by a senior public health nurse, a statistical assistant and an IEC assistant in addition to administrative staff. Sole responsibility to carry out the district family planning and maternal child health activities lies with the district office which is headed by a district officer. To supervise clinics and panchayat based centres, there are a number of intermediate supervisors.

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[9] This figure was obtained from an unpublished official source.

Approximately, one intermediate supervisor controls four to seven panchayat based workers.

Technical assistance needed by the regional offices and district offices is provided by the six divisions located at the central office (see Appendix 5.1).

The second government agency which provides family planning services is the Integrated Community Health Services Development Project (ICHSDP). This project looks after 23 of the 75 districts. The ICHSDP also provides its services in the three settings as described earlier in the FP/MCH Project section. In 1969, a Community Health and Integration Division was established within the Department of Health Services to deliver community oriented health services(ICHSDP, 1982:9). A year later, it was transferred under the Integration Board constituted in the Ministry of Health.

According to the 1980-81 Annual Report of the Integrated Community Health Services Develoment Project, there are two types of health posts under the integration programme. The first one is of the 'Primary Integration' type. The integrated primary health post provides the following services under the integration programme:

(1) Family planning motivation with emphasis on permanent sterilization methods; issue of condoms and pills to married couples and arrangement of sterilization camps;

(2) Nutrition monitoring and nutrition education including rehydration education;

(3) Health education;

(4) Smallpox surveillance;

(5) Expanded immunization programme (Immunization including smallpox vaccination, BCG, DPT and TT);

(6) Recording of vital events;

(7) Case finding, treatment and isolation of TB patients;

(8) Case finding, treatment and case-holding of leprosy patients;

(9) Referral services;

(10) Treatment of common illnesses; and

(11) Training of local health volunteers.

The second one is the 'Fully Integrated' health post which provides additional services of antenatal, delivery and postnatal care, both domiciliary and at health posts and malaria surveillance, treatment of cases and control measures.

Each health post under the integrated programme serves four to six veks [10]. One village health worker (VHW) is assigned to serve one vek. According to the 1980-81 annual report, one VHW makes two visits a year in each household in the Mountains and six visits a year in the Plains and Hills. Wherever the ICHSDP has a responsibility for malaria surveillance and containment, each household is visited monthly.

The Integrated Community Health Service Development Project has 48 district health offices which supervise all the integrated health posts (see Appendix 5.2). Out of 48 district health offices, six are fully integrated, 17 intermediate and 25 primary. The family planning and maternal child health activities are fully served under the Integrated Community Health Development Project. The FP/MCH Project has no responsibility in the 'fully integrated' districts with regard

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[10] A vek on average covers one and a half panchayats.

to service delivery. However, the FP/MCH Project provides commodities, particularly oral pills and condoms and facilities for sterilization and other special campaigns.

The UNFPA Needs Assessment team identified several problems for ICHSDP, particularly in manpower development, training, supervision, logistics and construction of health posts. Because of these problems, the establishment of health posts is far below the target. According to the target, 700 new integrated health posts were to be opened by the fiscal year 1975/76, but there were only 644 such health posts of all types as of 1980/81.

5.3.2B NON-GOVERNMENTAL PROGRAMMES

The Family Planning Association of Nepal (FPAN) is the most active non-government organization which is involved in service delivery. On a small scale, the Nepal Women's organization and Nepal ex-servicemen's organization distribute condoms and oral pills in selected pockets of Nepal.

The Family Planning Association of Nepal was established in 1959. At the end of 1982, it operated 26 clinics which provided the services of a wide selection of contraceptive methods and engaged in educating people of various backgrounds. It operated largely in cooperation with the two government agencies mentioned before.

During the year 1982, the FPAN was involved in operating a number of small scale projects, of which the Boudha-Bahunpati Family Welfare Project, and the Integrated Family Planning and Parasite Control Project are worth mentioning. The Boudha-Bahunpati Family Welfare

Project offers a family planning programme integrating it with health, agricultural development and rural improvement programmes (FPAN, 1982:53). It operates in the 33 village panchayats of Sindhulpalchowk and Kavre districts. The Integrated Family Planning and Parasite Control Project aims at enhancing acceptance of family planning through provision of a programme to overcome the problem of parasite infestation like round, hook and whip worms. The programme aims to achieve its objectives through involvement and participation of the community (FPAN, 1982:65). This programme was under way in the three wards of Bhaktapur Town panchayat and three village panchayats of Panchkhal. According to the FPAN annual report of the year 1982, the parasite infestation rate in the project areas was around 90 percent.

The Nepal Contraceptive Retail Sales (CRS) Project is a non-profit non-government organization which operates under the policy guidance of the Nepal FP/MCH Project (Nepal FP/MCH Project, no date:34). The CRS Project sells condoms and oral pills through its retailers. The project started in 1978; after four years, there were 5,300 retail general shops and 700 drug stores in 60 of 75 districts selling condoms and oral pills at nominal prices.

5.3.3 BUDGETS

For the sixth plan (1980-1985), the allocated budget is 232.9 million rupees for the national family planning programme as against 25,751.2 million rupees for the total national budget. It should be mentioned that it is very difficult to estimate the actual allocated budget and expenditure in the family planning programme in Nepal. The budget shown in column 2 of Table 5.2 represents only the budget for

TABLE 5.2: FAMILY PLANNING, HEALTH AND TOTAL GOVERNMENT BUDGET BY FISCAL YEAR@ IN NEPAL.

	Budget in million Rs.			Family Planning as percent of	
Fiscal Year	Family Planning Programme[1]	Health Ministry	Total Government	total budget	health budget
1968/69	2.02				
1969/70	4.00		683.8[2]	0.59	
1970/71	6.89		769.5[2]	0.90	
1971/72	7.50	151.24†[3]	889.5[2]	0.84	
1972/73	5.33		982.8[2]	0.54	25.50††
1973/74	7.95		1226.3[2]	0.65	
1974/75	10.90		1513.8[2]	0.72	
1975/76	18.50	120.75[2]	1913.4[2]	0.97	15.32
1976/77	23.93	162.48[2]	2371.6[2]	1.01	14.73
1977/78	14.12	164.06[2]	3087.4[2]	0.46	8.61
1978/79	18.88	178.34[2]	2886.3*	(0.65)	10.59
1979/80	21.45	93.30*	3215.6*	(0.67)	22.99
1980-85	232.90[4]	1060.00[4]	25751.2[4]	0.90	22.00**

Notes:
- * actual expenditure as shown in the Sixth Plan, Table 1.1, page 7.
- ** based on the allocated budget for the Sixth Plan; Family Planning budget as percent of health does not include 12 percent of health budget which belongs to ICHSDP.
- () figure inside parentheses derived using actual expenditure in denominator and allocated budget in numerator.
- @ Fiscal year starts approximately in the middle of July and ends in the middle of July of the next year.
- † for years 1969/70 to 1973/74
- †† for years 1970/71 to 1974/75.

Sources:
[1] The Nepal Family Planning and Maternal Child Health Project, 'Annual Report 2038/039', His Majesty's Government of Nepal, Ministry of Health, Kathmandu, p.50.
[2] United Nations Fund For Population Activities, 'Report of Mission of Needs Assessment for Population Assistance', Report no. 21, New York, p. 125.
[3] His Majesty's Government of Nepal (1970), 'Fourth-Plan (1970-75)', page 253.
[4] His Majesty's Government of Nepal (1980), 'Sixth Plan (2037-2042)', National Planning Commission, pages 103-114.

the Nepal Family Planning and Maternal Child Project. It is very hard to impute the total cost for the family planning programme run under the various integrated projects.

Table 5.2 provides an approximation of the budget for family planning health and total government programmes. It is to be noted that the budget for family planning programme had never exceeded one percent of the total budget except in the fiscal year 1976-77. As compared to Bangladesh, the family planning programme's share of the total government budget is very low. In Bangladesh, 3.1 percent of the total government budget was allocated to family planning in 1981 (Nortman et al., 1982:59). The family planning programme's share in the total health budget is also considerably smaller in Nepal than, for instance, in Bangladesh. In the fiscal year 1980/81, over 60 percent of the FP/MCH Project's expenditure was borne by foreign agencies.

5.3.4 TARGETS AND ACHIEVEMENTS

The national target[11] is set at the national level every five years and from there specified for each fiscal year. Every year the target is revised at the beginning of the fiscal year according to the

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[11] Demographic targets were set up in the fifth five-year plan (1975/76- 1979/80) to reduce the crude birth rate from 40 to 38 per thousand population and the infant mortality rate from 200 to 150 per thousand live births. In the sixth five-year plan (1980/81-1984/85), the target is to reduce the total fertility rate by 0.5, that is, from 6.3 to 5.8. These targets were translated into acceptors by contraceptive mix. A new acceptor is defined as a person who accepted a particular method at first time.

achievement of the previous fiscal year. The national target is divided among districts by district officers themselves keeping the previous year's achievement in mind. The target numbers of new family planning acceptors are presented in Table 5.3. As can be seen from this table, the target for the fiscal year 1980/81 was 150,000 new acceptors, of whom 27 percent (i.e. 40,000) were sterilization acceptors. Of the 160,000 new acceptors in the fiscal year 1981/82, 25 percent (i.e. 40,000) were sterilizations. Approximately three-fourths of the target were temporary methods.

TABLE 5.3: FAMILY PLANNING ACCEPTORS' TARGET AND ACHIEVEMENT AND RATE OF NEW ACCEPTANCE PER 1000 MARRIED WOMEN AGED 15-44 BY FISCAL YEAR.

Fiscal year	Family Planning New Acceptors Target	Achievement	Percent of target achieved	Rate of acceptance per 1000 married women aged 15-44
1968/69	19,400	7,774	40.1	n.a.
1969/70	16,000	29,740	185.9	n.a.
1970/71	18,000	34,433	191.3	n.a.
1971/72	35,000	43,838	125.3	21
1972/73	60,000	65,095	108.5	30
1973/74	80,000	86,079	107.6	39
1974/75	86,000	98,312	114.3	44
1975/76	140,000	138,634	99.0	60
1976/77	140,000	126,532	90.4	54
1977/78	140,000	174,106	124.4	72
1978/79	140,000	165,774	118.4	66
1979/80	140,000	196,534	140.4	77
1980/81	150,000	216,010	144.0	82
1981/82	160,000	223,215	139.5	83

Source: Nepal Family Planning and Maternal Child Project, 'Annual Report 2038/039', His Majesty's Government of Nepal, Ministry of Health, Kathmandu, p.36.

Notes: n.a. means not available.
Rate of new acceptance per 1000 married women aged 15-44 is calculated based on denominator produced by the CONVERSE output. For input data for CONVERSE, see Appendix 8.1.

The third column of Table 5.3 indicates the number of new acceptors[12] recruited each year and the fourth column gives the percent of target achieved. Except in 1968/69, 1975/76 and 1976/77, the percent of target achieved has always been more than 100. The ratio of new family planning acceptors per 1000 married women aged 15-44 has been increasing year after year reaching 83 in 1981/82, but the rate is still far below other countries, such as Thailand (140 in 1980) and Indonesia (131 in 1980). However, the rate is much higher than that of Bangladesh (63 in 1980) and India (52 in 1980)[13]. The problem of the Nepalese family planning programme has been the inability to provide a desired contraceptive mix. Since the beginning of the programme in Nepal, the proportion of permanent users never exceeded 14 percent of the total new acceptors except in the fiscal year 1968/69 (Table 5.4). The programme was dominated by a large proportion of condom acceptors which reached as high as 68 percent of the total new acceptors in 1979/80. Oral contraceptives contributed

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[12] The Nepal Family Planning Programme makes no attempt to distinguish between 'programme acceptor' and 'method acceptor' because of the difficulty of obtaining accurate data. For definition of 'programme acceptor' and 'method acceptor', see C. Chandrasekaran(1975), 'Acceptor Data', Chapter 2 in MEASURING THE EFFECT OF FAMILY PLANNING PROGRAMMES ON FERTILITY, (edited by) C. Chandrasekaran and A.I. Hermalin, IUSSP, Ordina Editions, Liege, pp. 17-53.

[13] Rates for Bangladesh, India and Thailand were computed from data given by D. Nortman and J. Andrew (1982), 'Population and Family Planning Programs: A Compendium of data through 1981', 11th edition, The Population Council, New York, N.Y.

The Indonesian rate is quoted from John A. Ross and Sri Poedjastoeti, 'Contraceptive Use and Program Development: New Information from Indonesia', INTERNATIONAL FAMILY PLANNING PERSPECTIVES, vol. 9, no. 3, October, pp.68-77.

approximately one-third of the programme (with the exception of 1968/79) and decreased steadily to approximately one-fourth in 1981/82. As is obvious from Table 5.4, the proportion of IUD

TABLE 5.4: PERCENTAGE DISTRIBUTION OF NEW ACCEPTORS BY METHOD AND FISCAL YEAR

	Method							
				Sterilization				
Fiscal year	Oral pills	Condom	IUD	Female	Male	Depo-provera	All	Number of acceptors
1968/69	17.4	25.1	15.2	-	42.3	-	100.0	7,774
1969/70	34.5	48.7	3.7	-	13.1	-	100.0	29,740
1970/71	30.5	54.5	2.1	-	12.9	-	100.0	34,433
1971/72	36.2	52.2	2.7	-	8.9	-	100.0	43,838
1972/73	36.9	54.9	0.9	0.9	6.4	-	100.0	65,095
1973/74	31.4	60.3	0.3	0.9	7.1	0.0	100.0	86,079
1974/75	27.4	66.9	1.1	0.7	3.8	0.1	100.0	98,312
1975/76	27.1	63.4	1.2	1.6	6.6	0.1	100.0	138,634
1976/77	26.3	59.1	0.9	4.3	8.6	0.8	100.0	126,532
1977/78	25.5	61.5	0.5	4.5	7.0	1.0	100.0	174,106
1978/79	22.9	64.5	0.7	6.8	4.2	0.9	100.0	165,774
1979/80	22.5	68.2	0.5	5.7	2.2	0.9	100.0	196,534
1980/81	22.7	65.1	0.6	8.4	2.2	1.0	100.0	216,010
1981/82	21.9	62.5	0.5	9.0	4.7	1.4	100.0	223,215

Source: Nepal Family Planning and Maternal Child Health Project(no date),'Annual Report 2038/039', His Majesty's Government of Nepal, Ministry of Health, Kathmandu, p.37.

acceptors has been decreasing every year. Its contribution to total new acceptors was only a half percent in 1981/82. Depo-provera contributed only 1.4 percent of total new acceptors in the same year. Thus, service statistics show that the majority of new acceptors (four-fifths) in Nepal's programme adopt temporary methods (condoms and oral pills).

The programme could have been very effective in reducing fertility if acceptors had continued for longer periods, that is

TABLE 5.5: CONTINUATION RATES BY METHOD AND DURATION OF ACCEPTANCE.

Duration	Method			
	Oral pills	IUD	Condom	Depo-provera
End of one year	36.7*	65.7*	20.0**	70.0***
End of two years	19.8*	50.0*	10.0**	55.0**
End of three years	13.2*	35.0**	5.0**	40.0**
End of four years	8.0**	20.0**	2.5**	20.0**
End of five years	4.0**	10.0**	1.0**	10.0**

Notes: * Nepal FP/MCH Project (1976), 'A report on national family planning acceptors' follow-up survey 1973-74', Evaluation Division, Kathmandu.

** Assumed rates by the Nepal FP/MCH Project.

*** K. Vaidya and R. Manandhar (1974),'Field Study of Depo-provera in FP/MCH clinic Gokarna', FP/MCH Project, Kathmandu.

Source: B.R. Pande(1980), 'Population Policy and Family Planning', in POPULATION OF NEPAL, Country Monograph Series No. 6, Economic and Social Commission For Asia and the Pacific, United Nations, Bangkok, p. 87.

a year or more. Table 5.5 presents continuation rates by various methods and duration of use. The purpose of presenting these rates is to provide appropriate length of use. In Nepal's programme, only 37 percent of oral pills users continued beyond one year and 20 percent beyond two years. Of those who stopped using before one year, a large proportion discontinued using the method before three months, largely due to unforeseen side-effects. Of those who accepted condoms in

Nepal's programme, it was estimated that only 20 percent continued using them beyond one year. Table 5.5 also indicates that IUD and Depo-provera acceptors have a reasonably high continuation rate, but their contribution to reducing fertility is negligible as the proportion using these methods has been very small.

CHAPTER 6

FACTORS AFFECTING USE AND NON-USE OF CONTRACEPTION

6.1 INTRODUCTION

Until 1981, only about half of the currently married women in Nepal had any knowledge[1] about prevention of pregnancy by using a family planning method. Indeed, in 1976, a little less than one-fourth of the women knew of such a method according to the Nepal Fertility Survey,1976 (Ministry of Health, 1977:63). Before 1969 family planning information and services were available only in hospitals and from a Family Planning Association office in Kathmandu; modern contraceptive methods were virtually unknown to most Nepalese(Macfarlane, 1976:238; and Gorer, 1967:173). Macfarlane noted in his village study that the Gurkha soldiers who returned after serving in the British and Indian armies knew about birth control methods. A spot announcement on family planning was started by Radio Nepal[2] on family planning once the Government of Nepal recognized the need for a national programme on family planning[3].

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[1] Questions relating to knowledge which were asked in the two surveys(1976 and 1981) are reproduced in the Appendix.

[2] Radio Nepal is the only station operating in Nepal; because of the terrain configuration, the reception is, however, rather poor so that it is not audible in many villages.

[3] The Nepal Family Planning and Maternal Child Project was established under the semi-autonomous National Family Planning and Maternal Child Health Board which came into existence in late 1968.

Probably in all pre-industrial societies, population control is achieved through non-mechanical methods of pregnancy prevention[4] or through abortion or infanticide(Dumont, 1965:316; Douglas, 1966:263; Himes, 1963:3-56; Nag, 1968:132). Several studies conducted in Nepal indicate that there was no deliberate use of any mechanical or non-mechanical method to prevent having children (Macfarlane, 1976:238; Ross, 1981:90 and Worth and Shah, 1969:34). There is also no evidence regarding the use of abortion and infanticide (Gorer, 1967:286). Some people very half-heartedly believe that taking a bath in sulphurous streams causes an abortion (Gorer, 1967:173). Macfarlane noted that even coitus interruptus was unknown in Gurung villages. Furer-Haimendorf (1964:40) explained that there was a great deal of sexual freedom in the Sherpa society: '... sexual intercourse between those neither bound by the ties of marriage nor by vows of celibacy is not regarded as sinful or socially reprehensible.' That such freedom did not result in a large number of Themba[5] children was considered to be due to a lengthy infertile period following the menarche as the use of contraception was unknown in that society (ibid., p.41).

In the 1976 Nepal Fertility Survey(NFS) virtually no woman reported using traditional methods. In fact, only one percent of ever-married women said they knew of such methods being used[6] in

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[4] They are referred to as coitus interruptus and abstinence or other traditional methods of birth or pregnancy prevention.

[5] Themba is a local Sherpa term for a child born to an unmarried girl who has not yet been engaged.

[6] Questions asked relating to contraceptive use are reproduced in the Appendix.

their villages. Prolonged breastfeeding[7] could have led to longer birth-intervals, but given the high infant mortality[8] it was often interrupted; and deliberate and conscious prolongation of breastfeeding was not intended to delay the next pregnancy in Nepalese society(Macfarlane, 1976:238).

Several studies carried out in Nepalese villages indicate that the overwhelming majority of men and women are aware of the consequences of population growth (New Era, 1981:24; Poffenberger, 1980:89; Macfarlane, 1976:241). If that is so, why would they not practise contraception? Basically, there can be three reasons why Nepalese families have not been interested in family planning until recently. They are: high child mortality, no pressure on land and enough work opportunities outside Nepal or in other parts of Nepal.

The first of these, child-mortality, is one of the concerns for most Nepalese couples. Poffenberger's study (1980:88) reveals that two-thirds of his respondents noted that children die frequently. Among Gurungs and other tribals there is a tradition of giving a name belonging to a Nepalese caste family[9] to a new born child if all his brothers and sisters have died(Coburn, 1982:76). The belief is that this will bring good fortune to the child's family and save the child

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[7] Over 80 percent of ever-married women breastfed for 24 months or more in the last closed interval(Ministry of Health, 1977:61).

[8] Infant mortality was as high as 208 infant deaths per 1000 live births in 1965/66(Worth and Shah, 1968:29) and only recently was reduced to about 152 infant deaths per 1000 live births(Ministry of Health, 1977:48).

[9] The Nepalese castes refer, mostly, to Brahmins and Chhetris.

from death. Macfarlane(1976:242) indicated in his study that couples were reluctant to use contraception(temporary as well as permanent methods) because of their experience of infant and child loss. Several of his respondents specifically stated that they wanted to have two children of each sex in case one of them died.

The second reason for not practising contraception has been lack of virtually any pressure on land, which is closely related to the third reason. Traditionally, all tribal groups had land under the kipat tenure system (Regmi, 1976:20), in which an individual obtains right to land by virtue of being a member of a particular kin group. In the eighteenth century, the kingdom of Nepal was unified by the first king of modern Nepal, Prithvi Narayan Shah; soon afterwards a large number of Hindus, Brahmins and Chhetris migrated into the tribal areas (Caplan, 1970:20 and Peet, 1978:31). To gain power over the tribal people, collect taxes, and enforce the rules made by the government, as well as for various other reasons, Brahmins and Chhetris were granted birta land (Regmi, 1964:21). According to Regmi (1964:16), birta land is considered an individual property which can be controlled by the State and is a guarantee of a regular income. Its ownership symbolizes wealth as well as high social status. Gradually, all the kipat land owned by the tribal groups was transferred to raikar land, defined by Caplan (1970:3): '... as a system of "State landlordship" under which the rights of an individual to utilization and transfer of the land are recognized by the State so long as taxes are paid'(Regmi, 1963:19). This system strengthened the power of birta landowners as representatives of the government; they also received a certain amount of free labour (Regmi, 1976:33). There were also some instances during Prithvi Narayan Shah's reign, when the

newly established government confiscated kipat land from tribal people and granted it to non-Limbu settlers under raikar or birta tenure (Regmi, 1965:88). At the same time, the need for cash was greatly increased and the tribal people had to turn to the wealthier Hindus for loans (Caplan, 1970:5 and Hitchcock, 1961:19). Hitchcock (1963:77) stated that the main reason for taking these loans was to meet the need for food. In order to obtain a loan, they had to give their land as security. Until the loan was paid back, the creditor had the right to keep the land for cultivation as part of the interest (Caplan, 1970:92). As a result, tribal groups were left with only a limited amount of land. In far eastern Nepal, Caplan(1970:99) found that almost three-fourths of mortgaged land(i.e. kipat land) were under the control of non-Limbu people. The largest proportion of kipat mortgaged lands was kept by the two highest castes, particularly the Brahmins.

The third reason was enough work opportunities. While the tribal people were under such hardships, work opportunities outside Nepal became available in India, mainly military service and in the tea estates in Sikkim and Darjeeling, during the British rule there. Caplan(1970:6) noted according to O'Malley(1907) that Nepalese constituted more than half of the Darjeeling population in 1891. As grain deficit emerged due to population pressure on land and the need for cash increased, outside jobs became more important (Hitchcock, 1966:16-19; Caplan, 1970:76-124; McDougal, 1968:57-76). As pointed out by L. Caplan(1970:5), once they got jobs and worked for several years a number of Limbus of the eastern Hills returning for their home-leave repossessed lands that had been mortgaged to the Brahmins. The Magars of the western Hills did the same. In the far-western

Hills, C. McDougal(1968:57) found that the income derived from agriculture was insufficient; therefore, the local people supplement their income from other sources either within the district or outside the district, in the Plains or in India.

With regard to the Mountain tribal people, after the successful introduction of cultivation of potatoes in the Mountains around the middle of the nineteenth century, there were enough potatoes to feed family members and workers who migrated from Tibet. Any extra hands that were freed from farming were devoted solely to the maintenance of religion and the arts (Furer-Haimendorf, 1964:9-10). Furer-Haimendorf(1964:13) indicates that the Sherpas' standard of living was far superior to that of the Hill tribal people because Sherpas had a trade with Tibet. The income from this trade amounted to between one-fourth and one-third of their total income before the Chinese occupation of Tibet. Thereafter, the Sherpas' trade with Tibet gradually declined; fortunately, the trekking business and tourism started flourishing in Nepal and many Sherpas are now occupied as porters and guides.

Though the current use of family planning has more than doubled since 1976, from 2.9 percent of currently married and not pregnant women in 1976 to 7.8 percent in 1981, the prevalence of contraceptive use is still extremely low. The Government of Nepal has made efforts to increase the availablity of family planning services so that every needy Nepalese couple will have access to them as easily as possible. The number of service outlets has been increased more than threefold between 1976 and 1980 not counting outlets through the Integrated Health Services. The level of knowledge regarding contraceptive

methods has more than doubled during the same period. From the programme administrators' viewpoint, a family planning method should be available in all village panchayats either through Family Planning Centres or Health Posts. However, as we shall see later in this chapter, this is not always the case.

As mentioned in Chapter 5, the family planning programme was first introduced in the cities of the Kathmandu valley. At the beginning of the programme, contraceptive methods may be expected to be more in demand in the urban areas. Whether availability creates demand or vice versa is an arguable point. Urban demand may be expected because of the concentration of people with higher status and more education in these areas. Educated and economically better-off couples are likely to be the first ones to use contraception, and thus the majority of families who favour a small number of children are found in the urban areas. Information and standards of couples' behaviour are quickly communicated through the social system in the urban settings and contraceptive use is expected to spread from higher-status to lower-status groups and from the city to the village (Freedman, et al., 1959:102). As the programme enters the rural areas, rural/urban differences in the level of contraceptive use will be reduced. It is comparatively easy to supply concentrated populations where other amenities, such as health services, are in existence. In the rural areas most infrastructure has to be built up from scratch. Often the health posts and health centres are far from adequate to dispense contraception as they have other priorities within the health programme.

In this chapter, differentials in contraceptive use and causes of use and non-use in Nepal will be examined one by one. As many of the individual 'factors' associated with variations in current contraceptive prevalence are interrelated, in the subsequent chapter, a multivariate approach will be adopted to examine the net effect of individual factors on contraceptive use. The analysis that follows will identify the effects on contraceptive use among exposed women[10] of

I. Demographic variables

II. Desire for more children

III. Husband-wife communication on family size

IV. Social and economic variables

V. Availability and access to family planning services

6.2 DEMOGRAPHIC FACTORS

Tables 6.1 and 6.2 indicate that Nepalese women, not unlike those in other less developed countries, are less likely to be using a contraceptive method when they are young (15-24 years) or old (45-49 years). They are more likely to use contraception to limit births once they have had three or more living children with a minimum of one son. Anthony (1979:157) in his village study found that Nepalese women were willing to practise contraception only after reaching a desired family size or exceeding it.

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[10] An exposed woman is one who is not pregnant, is currently married and aged 15-49 years. As a question on fecundity was not asked, it was not possible to include fecundity as one of the criteria.

TABLE 6.1: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY AGE OF WOMAN, 1981.

Age of Woman	Number of women	Percent of current users
15-19	522	0.3
20-24	1016	3.8
25-29	1127	6.8
30-34	902	12.5
35-39	705	10.0
40-44	597	10.7
45-49	408	8.6
Total	5277	7.6

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

The proportion of current users in the Contraceptive Prevalence Survey(CPS) increased gradually with age up to 30-34 years and thereafter declined slowly (Table 6.1). The lowest prevalence rates were found among women aged less than 20 years. From a study conducted in rural Nepal, L. Bennett(1976:3) reports that there is a belief that it is easier for a woman to have children while she is young and her body is 'soft and flexible'. Women feel their health will be better if they give birth frequently because mothers are given good food during the post-delivery period and, hence, become healthier. Consequently, successive births occur at comparatively

short intervals[11] since there are no taboos on sexual intercourse once the mother has recovered from the births (Hitchcock, 1966:49). In addition, there is a constant pressure from the mother-in-law on the couple to have a child soon after the consummation of the marriage. The women of the household and especially the mother-in-law will be watching for any sign of pregnancy (Bennett,1976:2).

By the age of 30-34 years, the majority of the women have had three or more living children (Ministry of Health, 1977:128). By that age, the proportion of current users rises to 12 percent with a concurrent increase in the use of permanent methods. As the woman becomes older, it is somewhat less likely she will be using contraception. There is a belief among older women that sexual intercourse is harmful physically and spiritually when it is not necessary to have more children(Bennett, 1976:14). The prevalence of sexual abstinence among Nepalese grandmothers has also been confimred by Jee-Peng Tan(1983:433-444). In addition, older women are more traditional than younger women and they are less likely to accept innovation and change. It is very difficult to initiate something which is a desirable or beneficial change from a Westerner's point of view but which has little value in the eyes of the Nepalese society (Hosken, 1974:113).

The contraceptive prevalence rates increase, as may be expected, with the number of living children. Couples who have had three or more living children are more likely to be current users than those

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[11] This argument however, does not find support in the available data on birth intervals. Mean length of closed birth interval among exposed women with one or more live births was 48 months according to the NFS, 1976 (Ministry of Health, 1977:231). Of course, this calculation did not take account of still births and miscarriages.

with a smaller number(Table 6.2). The age of the woman makes, however, a substantial difference once she has had a certain number of living children. Only among women with fewer than three living children does the proportion of current users not vary systematically by age. Of those with three or more living children, the proportion

TABLE 6.2: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY NUMBER OF LIVING CHILDREN, NUMBER OF LIVING SONS, AND AGE OF WOMAN, 1981.

	Age of Woman					
Number of living children and sons	15-24	25-34	35-44	45-49	Total	Number of women
Number of living children						
0	0.3	0.1	0.0	(0.0)	0.3	879
1	1.6	3.1	2.9	(0.0)	2.0	908
2	3.6	5.2	3.4	3.0	4.3	1004
3	16.0	10.7	9.5	3.0	10.6	886
4	(24.1)	18.8	11.8	10.0	15.1	656
5 or more	*	16.2	15.6	12.8	15.1	941
Number of living sons						
0	0.5	1.0	2.0	0.0	0.8	1599
1	3.5	7.1	5.2	2.9	5.4	1562
2	12.0	12.0	13.1	8.4	12.1	1213
3 or more	(20.7)	21.4	15.3	14.5	17.4	886
Total	2.6	9.4	10.3	8.6	7.6	5276

Notes: An asterisk * means number of women is less than 10 and percentage within parentheses means denominator is less than 25 but greater than 10 women.

Number of women may not add up to total because of 'don't know' and 'not reported' cases.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

of current users is substantially higher among the younger than the older women. Obviously, the use of contraception is also a cohort phenomenon. The younger ones are presumably more open minded about

innovation and more aware of the need to limit their family size; while the older women suspect that they are infecund or refrain from sexual intercourse because of traditional beliefs mentioned earlier. Consequently, family planning is regarded as not needed at that age.

Number of living sons is another important factor that affects the use of contraception in Nepal. Given, once again, the predominance of contraceptive use for limiting family size rather than for spacing, there are a number of reasons why couples wait to have sons before using family planning. Apart from religious reasons for wanting to have a son there are good economic reasons as well. In the Hills, in particular, for a majority of families, farming is insufficient to produce food for the family plus cash income. Therefore, having a son is important for gaining access to extra income in the future. Cash income is very essential in the Hills not only to buy grains, but also to buy kerosene, salt, cooking oil, soap, tobacco and paper, spices, tea, cloth, metals, for payments to a tailor and a blacksmith and to pay land taxes (Caplan, 1970:78). In order to meet the cash demand as well as food requirement, many farmers acquire loans from high caste families such as the Brahmins (Hitchcock, 1963:77 and 1966:105; Caplan, 1970:76). Therefore, many young people from the Hills look for jobs outside their homes. In the far western Hills, C. McDougal(1968:68) found that many villagers relied on outside jobs for income. The Limbus of the eastern Hills and the Magars of the western Hills have joined the army to earn income because of economic hardship (Caplan, 1970:114; Hitchcock, 1963:81). In the villages McDougal studied, he found servicemen bringing their savings home for their families. Once a man is

accepted for enlistment in the British or Indian armies, the economic future of his family is secured. There is also a good deal of glamour attached to foreign service in general and the army in particular(Adams, 1980:75).

As expected, the proportion of current users of contraception increased markedly with the number of living sons: it was highest among those couples who had at least three living sons and where the wife was 25-34 years of age (Table 6.2). It declined with the increasing age of the wife, as would be expected. In the families with three or more living sons, approximately 20 percent are current users of contraception if the wife is less than 35 years of age, compared to 14 percent if she is 45 years or more. However in each age category there was a steadily increasing prevalence of current use with the number of surviving sons.

As the number of living children and the number of living sons are interdependent, the proportion of current users is presented in Table 6.3 controlling for these two factors simultaneously. Current use rates in each category (by number of surviving children) increase with the increasing number of sons among them. Only the small proportion of current users among families with one surviving child remains virtually the same independent of whether the family has a son or not. Admittedly, there are only 18 women with one surviving child currently using a family planning method in the sample. More than four-fifths of them are under 35 years of age. Only one-fifth of them are educated. The majority of them are involved in farm work. Two-thirds perceive that they can reach a family planning service outlet within one-hour's travelling time. As expected, two-thirds are

using a temporary method and the same proportion want to have more children in the future.

Table 6.3: PERCENT OF CURRENTLY MARRRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY NUMBER OF LIVING SONS AND NUMBER OF LIVING CHILDREN, 1981.

	Number of Living children					
Number of living sons	0	1	2	3	4 or more	Total
1	-	2.1	5.8	8.3	8.7	5.4
2	-	-	4.3	11.2	16.3	12.1
3	-	-	-	20.2	18.1	18.5
4 or more	-	-	-	-	15.7	15.7
Total	0.3	2.0	4.3	10.6	15.1	7.6

Notes: - indicates no cases
Sources: The Nepal Contraceptive Prevalence Survey Data, 1981.

When the contraceptive methods used are considered, it is found that the majority of current users adopt sterilization. According to the service statistics(Chapter 5), a large proportion of couples accepted temporary methods, such as condoms and oral pills. Discrepancy between the service statistics and the survey data might be due to a high rate of discontinuation associated with the temporary methods, by over-reporting of condom acceptance in service statistics, by under reporting of condom use in the survey, or by some combination of the three. More importantly it could be due to two reasons: (1)a way of recording condom new acceptors in the programme. Generally, condom acceptors are supplied 15 condoms in each visit. As there is no good record keeping system for condom distribution, it is more likely that these persons are recorded as new acceptors in each visit, and (2)field workers leaving condoms to not interested couples at their homes and counted them as new acceptors to meet the target.

Table 6.4 shows that this starts at a comparatively young age. More than half of the (admittedly few) current users aged less than 25 years have accepted sterilization. Women of this age-group (15-24) who have adopted sterilization have had on average 2.9 children ever born and 2.8 surviving children per woman. Everyone of them had a minimum of one surviving son while more than one-fourth did not have daughters. There are, on average, 1.9 and 0.9 surviving sons and daughters respectively for every woman of this age-group. The majority of them are educated and housewives. Half of them have access to a family planning outlet within half an hour's distance and almost all can reach it within three hours' walk. An average walking distance to an outlet is about one and a half hours for them. Two-thirds of them discussed family size matters with their husbands.

The proportion of sterilizations among the users increases with women's age until, at ages 35-39 years, it reaches 90 percent. Among the older women it drops to 80 percent at ages 40-44 years and increases again to 91 percent at ages 45-49 years. Though these percentages are based on small numbers, the percent variation is found to be significant at five percent level. With increase in age, the proportion of women who use spacing methods such as oral pills, IUD, depo-provera and condoms slowly decreases. Table 6.4 also indicates that the majority of current users who have three or more living children adopt sterilization to terminate their childbearing. Although it is not an official policy, family planning workers insist that a couple must have a child before using oral pills and must have two children, with a minimum of one son aged more than five years, before undergoing sterilization. It is to be noted that more than one-third of the women with less than three surviving children did

manage to get sterilized. In the families with two or less living children, three-fourths of the sterilized women are under 35 years of age. The majority of them have one or more surviving sons and one or more surviving daughters as well. Approximately one-third of them are educated and one-half are housewives. One-half of the wives have also discussed family size with their husbands.

TABLE 6.4: PERCENTAGE DISTRIBUTION OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS ACCORDING TO AGE OF WOMAN AND NUMBER OF LIVING CHILDREN BY SPECIFIED METHOD OF CONTRACEPTION, 1981.

Characteristics	Male Sterilization	Female Sterilization	Oral Pills	IUD	Depo-provera	Condom	Total	Number of women
Age of woman								
15-24	23.1	30.7	25.6	2.6	2.6	15.4	100.0	39
25-29	33.8	35.0	22.1	1.3	1.3	6.5	100.0	77
30-34	37.4	37.4	16.5	0.9	1.7	6.1	100.0	115
35-39	61.4	28.6	8.6	0.0	0.0	1.4	100.0	70
40-44	44.4	34.9	14.3	0.0	0.0	6.4	100.0	63
45-49	54.3	37.1	8.6	0.0	0.0	0.0	100.0	35
Number of living children								
0-2	33.3	12.0	42.0	1.6	1.6	9.5	100.0	63
3	45.2	26.9	17.2	1.1	1.1	8.6	100.0	95
4	49.5	42.4	3.0	0.0	1.0	4.1	100.0	99
5+	38.7	45.1	12.0	0.0	0.7	3.5	100.0	142
Total	42.1	34.6	15.8	0.7	1.0	5.8	100.0	399

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

As mentioned earlier, among Nepalese women, family planning is commonly associated with limiting rather than spacing births. This phenomenon is common in countries in the early stages of family planning adoption. Although temporary methods such as oral pills and

condoms are widely available through health institutions and family planning fieldworkers, sterilization is still the most often used method according to survey data. Again, condoms and oral pills are less likely to be reported as currently used methods because of high incidence of discontinuity.

6.3 CONTRACEPTIVE USE AND DESIRE FOR NO MORE CHILDREN

The desire to have no more children may be used as an estimate of the demand for family planning services. At the beginning of a family planning programme, the target is those women who do not want any more children. There is, however, a considerable gap between the desire for no additional births and the practice of family planning. Freedman and Berelson (1976:9) pointed out a number of reasons why surveys find inconsistencies between this attitude and the practice of family planning. They have noted that inconsistencies may be due to: (1) lack of information or lack of supplies through reasonably convenient and legitimate channels, (2) people's habit of waiting to learn more about them before accepting the new contraceptive methods, (3) influence of other members of the household, such as husband or mother-in-law, who may have different attitudes toward family size and contraceptive use, (4) in surveys, the response to a single question about an attitude is, in probability terms, a modal response from an underlying preference ordering, (5) problems in denominator, in calculating of rates or ratios, particularly when it contains a proportion of sterile, or currently pregnant women, etc. and (6) inability (in a cross-sectional survey) to observe an increase in contraceptive use among those who wanted no more children.

Freedman and Berelson suggested that the inconsistencies between attitude and behaviour may be only apparent ones and must be resolved in the following manner:

> (1) narrowing the gap by removing the ineligible couples, (2) using additional questions or such devices as the Coombs scale to help classify the cases into those more or less ready to be acceptors, by indicating the intensity of their initial responses and whether they lean toward smaller or larger families, (3) testing by optimal program services, and (4) inquiring among the residual discrepant group to establish, as far as possible, whether the initial responses were invalid or whether there are countervailing attitudes or other barriers(1976:10).

As mentioned earlier, only eight percent of exposed women are currently using contraception in Nepal. The contraceptive use increases, however, to almost 22 percent if women who did not know an outlet are excluded. Among women currently using contraception, the proportion of those who do not want additional children is almost 16 percent; it increases to almost 60 percent for those who know an outlet and excluding those who think they have no need for family planning because of subfecundity or for social, or cultural reasons.

The expressed intention to use a family planning method in the future is another indicator of prospective contraceptive prevalence. According to the NFS(1976) data, only nine percent of the ever-married women indicated that they intended to use a family planning method in the future. This figure seems rather low; however, if we include only women who knew a family planning outlet and exclude those who think they have no need for contraception almost one-third of currently married women who were not current users indicated that they would use family planning in the future.

Slightly more than two-fifths of the currently married, fecund women said that they did not want any more children, in the CPS(1981); this proportion is only a little less than one third[12] in the NFS(1976).

TABLE 6.5: PERCENTAGE OF CURRENTLY MARRIED AND FECUND WOMEN WHO DO NOT WANT MORE CHILDREN BY AGE OF WOMAN, 1981.

Age of woman	Number of women	Percent wanting no more children
15-19	459	3.7
20-24	881	13.0
25-29	930	35.4
30-34	790	55.1
35-39	646	65.3
40-44	541	79.4
45-49	381	90.4
Total	4628	45.2

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

[12] A part of the difference could be due to differences in the definitions of the fecund women. A fecund woman is defined in the CPS(1981) as one who responded other than 'not needed' to a question 'What are the reasons for not using any family planning method so far?'. Since this question was not asked of women who did not know of contraception, the proportion of women not wanting any more children could be underestimated in the older age-groups. In contrast, a currently married woman who considers herself to be physically capable of bearing more children is defined as a fecund woman in the NFS(1976).

As expected, the proportion of currently married, fecund women who want no more children increased with age of the respondent(Table 6.5). The majority of the currently married, fecund women do not want more children when they reach age 30 or over. By that time, the majority of them would have four or more surviving children and two or more surviving sons.

Table 6.6 presents the proportion of currently married, fecund women wanting no more children by the number of living children and living sons, controlling for the age of the woman. As expected, the proportion wanting no more children rises sharply with the number of living children. About half or even more of the women do not want more children after having at least three surviving children. Among these women, fewer than five percent had any formal schooling. The majority of them have either a farm occupation, or no occupation. It is interesting to note that almost one-third of these women are from the three high caste ethnic groups (Brahmins, Chhetris and Newars).

The proportion of women wanting no more children indicates that the number of living sons is a decisive factor. The proportion rises sharply if there is at least one son in the family. The majority of women (except among those aged 15-24) want no more children once they have two or more living sons. Most of them are either housewives or working in non-farm occupation. Almost one-third of them are drawn from the Brahmin, Chhetri and Newari castes.

Table 6.7 presents the prevalence of current users by the expressed desire to stop bearing children, by age of the respondent. The proportion of exposed fecund women using contraception among those wanting no more children is almost ten times greater than among those

TABLE 6.6: PERCENTAGE OF CURRENTLY MARRIED AND FECUND WOMEN WHO WANT NO MORE CHILDREN BY NUMBER OF LIVING CHILDREN, NUMBER OF LIVING SONS, NUMBER OF LIVING CHILDREN AND SONS, AND NUMBER OF DEAD CHILDREN CONTROLLING AGE OF WOMAN, 1981.

Characteristics	Age of Woman 15-24	25-34	35-49	Total
Number of living children				
0	0.4	2.9	20.4	2.6
1	6.2	10.3	52.5	14.1
2	22.4	27.9	57.4	33.7
3	49.1	52.2	72.1	58.3
4	(84.7)	70.2	83.2	77.5
5 or more	*	86.3	91.2	89.6
Number of living sons				
0	1.7	10.0	34.5	8.1
1	16.4	34.0	70.1	38.8
2	41.7	59.6	80.8	67.3
3	49.0	74.8	89.2	82.0
4 or more	*	88.6	92.1	91.4
Number of living children and sons				
No living children	0.4	2.9	20.4	2.6
One living child				
0 son	4.6	10.7	39.9	10.8
1 son	6.7	10.1	58.9	16.0
Two living children				
0 son	8.9	14.4	46.8	21.3
1 son	25.9	32.0	60.5	37.6
2 sons	26.2	29.0	58.9	35.3
Three living children				
0 son	*	21.7	(23.3)	21.6
1 son	56.6	46.6	73.3	56.4
2 sons	43.2	58.8	76.3	63.1
3 sons	(51.6)	55.5	69.7	59.2
Four or more living children				
0 son	*	(20.8)	(60.0)	47.6
1 son	*	66.2	85.1	76.4
2 sons	(100.0)	79.7	86.3	83.8
3 sons	*	82.0	91.5	87.1
4 or more sons	*	89.7	92.6	91.7
Number of dead children				
0	8.8	40.7	70.2	35.5
1	17.6	49.9	81.0	55.1
2	6.0	53.0	78.7	63.9
3 or more	15.8	51.3	83.6	71.4
Total	9.8	44.4	76.3	45.2

Notes: An asterisk * indicates that the denominator is less than 10 women and percentages within parentheses indicate that the denominator is less than 25 but greater than 10 women.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

who want more children. The majority of women who want no more children and are not currently using contraception, are aged 35 or over and have four or more surviving children (not shown in table); and belong to tribal and low caste ethnic groups. Husband-wife communication on family size matters did not exist among four-fifths of them. Moreover, a majority of them did not have knowledge of contraception and its availability.

TABLE 6.7: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY DESIRE FOR NO MORE CHILDREN AND AGE OF WOMAN, 1981.

Desire for no more children	Age of woman 15-24	25-34	35-39	40-44	Total
Exposed women[1]					
Desire more	0.9	2.7	0.7	4.9	1.6
Desire no more	17.7	19.0	14.6	9.2	15.6
Don't know	2.0	3.1	1.6	1.1	2.0
Exposed and fecund women[2]					
Desire more	1.0	2.8	0.7	5.2	1.7
Desire no more	20.2	22.1	19.5	14.0	19.9
Don't know	2.2	3.5	1.9	1.2	2.7

Notes: [1] Exposed woman as defined in the text.
[2] Exposed and fecund woman as defined in the text.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

It is also to be noted that there are about two percent of exposed fecund women who want more children and yet are currently using contraception. They are mostly younger women of lower parity. More than half of them have easy access to a Family Planning outlet (within one hour's distance) and have good communication with their

husbands. As expected, the majority of them are using temporary methods, mostly oral pills.

Contraceptive use among women who want no more children more than doubled in the past five years: 20 percent in 1981(CPS) versus eight percent in 1976(NFS). From a programmatic point of view, it is very important to pinpoint where the remaining gap lies and what is the potential demand for family planning in Nepal.

To measure the unmet need for family planning, the proportion of currently married women who do not want any more children but, at the same time, do not use contraception, has been used (Westoff, 1978:15; Westoff and Pebley, 1981:127). Westoff pointed out that the 'unmet need' may remain at the same level when, in the transitional stages of a family planning programme, both the proportion wanting no more children and proportion using contraception are changing. The level of 'unmet need' will be zero if all women want more children, or if all women want no more children and all are using contraception (Westoff and Pebley, 1981:128). Using the WFS data, Westoff and Pebley found that, on average, an 11 percent (ranging from five to 25 percent) reduction in fertility rate could be achieved if all the need was met.

Westoff and Pebley have developed 12 alternative measures of 'unmet need' for family planning. They use the number of currently married women aged between 15 and 49 years as denominator; the numerators are women who do not want any more children and, alternatively,

1. are not using an effective method of contraception;

2. are not using contraception of any kind;

3. whose desired number of children is less than or equal to the actual number of children;

4. are fecund, not pregnant and not using contraception of any kind;

4a. are fecund(only the subjective measure of fecundity), not pregnant and not using contraception of any kind;

5. are fecund, not pregnant and not using an effective method of contraception;

6. are fecund, not pregnant, not breastfeeding and not using an effective method;

7. whose desired number of children is less than or equal to the actual number of children, are fecund, not pregnant and not using any method;

8. are fecund, not pregnant, not breastfeeding and not using any method;

9. whose desired number of children is less than or equal to the actual number of children, are fecund, not pregnant, not breastfeeding and not using any method;

10. whose desired number of children is less than or equal to the actual number of children, are fecund, not pregnant and not using an effective method;

11. whose desired number of children is less than or equal to the actual number of children, are fecund, not pregnant, not breastfeeding and not using an effective method.

According to Westoff and Pebley, among these twelve different measures 4 and 5 are the only appropriate ones for estimation of 'unmet need' because the others either underestimate or overestimate the need[13]. Since the use of inefficient methods is low in Nepal, measures 4 and 5 provide the same result (Westoff and Pebley,

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[13] According to Westoff and Pebley, unmet need estimated by means of measure 1 (wanting no more children and not using effective method) can be as high as 36 percent and as low as ten percent compared with measure 11 (wants no more children, desired number less than or equal to actual, fecund, not pregnant, not breastfeeding for one year or less, are not using effective method) in Nepal based on the NFS(1976) data.

1981:Table 2). The measure of 'unmet need', will help to identify which sub-groups of the population need additional emphasis to create potential demand. For the analysis, I will be using a measure which is similar to measure 5, selecting only fecund and not pregnant women for the reasons discussed above.

Another measure, namely the proportion of fecund, not pregnant women who are not practising contraception among those wanting no more children, indicates the magnitude of the 'gap' between desire and practice (Sarma and Jain,1974:98). The 'gap' will identify which sub-groups have not reacted according to their attitudes, or, alternatively, it will indicate shortcomings in the programme inputs. The 'gap' could be narrowed by increasing the proportion of current users among those who want no more children. Both 'unmet need' and 'gap' measures are, in fact, sensitive measures of 'unmet need' which according to Westoff(1978:15) is a product of the percentage who want no more children and percentage not using contraception.

According to Table 6.8, the level of 'unmet need' varies with age of the woman. The greatest 'unmet need' is among older women (ages 35 years or older). As women grow older, they may have reached their desired family size; some of the older women do not use contraception because of traditional resistance to innovation, but also they may more often suspect subfecundity or even abstain from or have infrequent intercourse. None of this may have been expressed in the answers during the interview.

In contrast, there is little variation in the magnitude of the 'gap' between desire and practice. Similar absence of any marked variation in the 'gap' indicator is observed with respect to the

number of living children (Table 6.9). The difference in the magnitude of the 'gap' between desire and practice is only 13 percentage points between women with less than two and those with five or more living children, whereas the difference is almost 65 percentage points in the case of 'unmet need'. Therefore, demographic factors have little influence in narrowing the 'gap' relative to the 'unmet need'.

TABLE 6.8: THE EXTENT OF 'UNMET NEED' AND 'GAP' IN CONTRACEPTIVE BEHAVIOUR BY AGE OF WOMAN, 1981.

Age of woman	Percentage of respondents[1] desiring no more children	'unmet need'[2]	'gap'[2]
15-24	8.9	7.1	79.8
25-34	38.1	29.7	77.9
35-44	63.7	51.3	80.5
45-49	84.9	73.3	86.0
Total	37.6	30.1	80.1

Notes: [1] currently married, not pregnant and fecund women.
[2] Difference between 'unmet need' and 'gap' is only in the denominator. For both indexes, the numerators are currently married women aged between 15 and 49 years who do not desire more children, are fecund, not pregnant and using no contraception. In the case of 'unmet need', the denominators are currently married, fecund and not pregnant women aged between 15 and 49 years; in the case of the 'gap' the denominators are currently married, fecund, not pregnant women who desire no more children.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

The level of 'unmet need' and the magnitude of the 'gap' are greatly influenced by the education of women. More than one-fourth of the currently married fecund women with some schooling who want no more children are not practising contraception as against almost two-fifths of such women with no schooling. When controlled for age, however, the pattern becomes different: the level of 'unmet need' is higher for women with no schooling among those aged 25 and older. The association between the level of 'unmet need' and education is positive among younger women (15-24 years) but it is negative among those aged 25-34 and 35-49 years.

The magnitude of the 'gap' between desire and practice has a strong association with the women's education (Table 6.9). Regardless of age, the 'gap' between desire and practice is highest among women who have no schooling. A similar finding based on the NFS(1976) data was reported by Rodriguez (1978:112). However, the difference he found between each educational group in the magnitude of the gap was not as large as in this study. The results confirm that the family planning programme has not yet reached uneducated women.

Table 6.9 indicates that the level of 'unmet need' and the magnitude of the 'gap' between desire and practice vary slightly with the work status of woman. The level of 'unmet need' is slightly higher among women involved in non-farm work than among farm women of all ages. The magnitude of the 'gap' between desire and practice indicates that occupation has a lesser effect than education. In other words, occupation plays a less important role in narrowing the gap between desire and practice than education of the woman. Women who do not work are in an intermediate position between farm and

TABLE 6.9: THE EXTENT OF 'UNMET NEED' AND 'GAP' IN CONTRACEPTIVE BEHAVIOUR BY NUMBER OF LIVING CHILDREN AND SELECTED BACKGROUND CHARACTERISTICS CONTROLLING AGE OF WOMAN, 1981.

Number of living children and selected background characteristics	Percentage of respondents desiring no more children and using no contraception ('unmet need')				Percentage of respondents using no contraception among those desiring no more children ('gap')			
	Age-group				Age-group			
	15-24	25-34	35-49	Total	15-24	25-34	35-49	Total
Number of living children								
0-1	2.8	7.5	39.6	8.6	100.0	88.5	95.8	95.0
2	18.7	26.2	56.9	32.4	98.2	96.0	96.9	90.7
3	33.5	41.3	61.9	47.2	67.1	79.1	86.7	81.0
4	47.4	50.2	8.1	61.3	(56.7)	69.8	(100.0)	77.9
5 or more	*	68.2	75.3	73.2	*	78.3	82.8	81.6
Education of woman								
No schooling	7.4	36.7	66.5	40.1	85.3	82.2	87.0	85.2
Some school	18.0	30.4	42.4	28.2	55.7	42.7	54.4	48.6
Work status of woman								
No work	9.0	40.9	66.6	35.2	71.6	77.0	82.5	89.1
Farming	5.9	30.8	64.0	44.4	84.8	85.1	91.6	73.8
Non-farming	16.1	39.9	70.0	42.4	(84.1)	64.0	78.7	79.9
Ethnicity								
Newars	10.1	35.3	60.7	40.3	*	59.1	69.7	66.5
Brahmins	11.4	42.5	60.5	40.4	(74.3)	66.0	76.1	71.8
Chhetris	4.0	35.5	57.4	32.1	(54.3)	68.2	81.3	74.0
Thakuris	(7.6)	22.0	(62.6)	31.6	*	(58.4)	(92.1)	80.2
Tharus	9.4	43.1	83.5	46.9	*	81.1	97.1	90.0
Magars	15.9	37.9	76.0	46.5	(80.0)	87.8	96.0	91.8
Gurungs	9.9	43.5	61.1	40.7	*	(100.0)	87.4	90.5
Rais	(7.7)	64.7	84.4	63.4	*	95.7	97.0	96.6
Tamangs	(7.1)	54.2	39.8	40.4	*	89.9	(100.0)	93.9
Muslims	8.9	34.1	74.9	43.7	*	87.9	95.9	94.3
Place of residence								
Rural	7.9	36.7	66.8	39.6	81.0	80.8	87.9	85.0
Urban	15.9	31.6	50.9	35.6	(57.1)	50.2	58.3	55.1
Geographical region								
Mountains	6.2	21.1	49.1	27.1	*	85.7	89.8	89.1
Hills	6.2	34.8	65.4	38.4	82.6	80.6	88.1	85.3
Plains	10.9	40.9	69.7	42.9	73.9	75.9	83.2	79.7
Access to family planning								
0-30 mins	13.4	24.4	40.2	27.7	(42.6)	33.1	43.9	39.0
>30 mins	11.9	35.2	57.5	38.3	62.5	56.6	65.0	61.4
Knew no outlet	7.2	38.2	70.8	41.0	100.0	98.5	98.5	98.5
Husband-wife communication								
Yes	9.8	31.1	46.9	29.6	51.1	52.0	60.3	55.3
No	7.9	38.0	68.9	41.7	91.9	88.8	90.2	89.8

Notes: * An asterisk indicates cells where the denominator is less than 10 women and percentages within parentheses( ) indicate cells where the denominator is less than 25 but more than 10 women.
Same footnotes as indicated in Table 6.8

Source: The Nepal Contraceptive Prevalence Survey Data, 1981

non-farm women.

The level of 'unmet need' and the magnitude of the 'gap' vary according to ethnic groups. The level of 'unmet need' ranges from 32 percent for Thakuris and Chhetris to 63 percent for Rais. The magnitude of the 'gap' ranges from 66 percent for Newars to 97 percent for Rais.

As expected, the 'gap' between desire and practice is considerably higher in the rural than in the urban areas. This relationship still persisted when we controlled for age of the women. The level of 'unmet need' is higher in rural than in urban areas regardless of age of the woman except among those aged 15-24 years. In the rural areas, the level of 'unmet need' is 40 percent as compared to 36 percent of those living in the urban areas. The magnitude of the 'gap' in rural areas is as high as 85 percent whereas it is only 55 percent in the urban areas. These findings prove once again, that the family planning programme is not effective in areas where the need for it is highest.

There is little difference in the magnitude of the 'gap' among the three geographical regions: in each region, the 'gap' is quite large. But this may be misleading; when controlled for age of the women, the data suggest that the 'gap' is largest in the Mountains, and smallest in the Plains.

With regard to the relationship between knowledge of availability of, and access to, family planning services outlet and the level of 'unmet need', the data clearly indicate that the level of 'unmet need' increases for women who have no knowledge of family planning service

outlet and for those who know where to obtain contraception, with the distance to such service outlet. Similarly, the 'gap' between desire and practice is largest among women who did not know of any family planning services outlet. These relationships persist even when controlling for women's age. Once again the 'gap' between desire and practice is largest where the need is greatest. These findings indicate that provision of family planning services within an easy distance reduces the gap, thus potentially increasing the use of family planning services. This result is consistent with what Rodriguez found from the NFS(1976) data.

Another important factor that affects the level of 'unmet need' and the magnitude of the 'gap' between desire and practice is whether the woman had discussed family size with her husband. Husband-wife communication on family size is inversely related to the level of 'unmet need' and the size of the 'gap'. Regardless of the woman's age, the level of 'unmet need' and the magnitude of the 'gap' is generally highest for those women who have no communication on family size with their husbands (Table 6.9).

6.4 HUSBAND-WIFE COMMUNICATION ON FAMILY SIZE

The lack of communication between husband and wife is regarded as one of the reasons for not using contraception in Latin American(Stycos, Hill and Back, 1956) and in Asian (Poffenberger, 1968) societies. Poffenberger(1968:761) reported in an Indian situation that throughout the development of a child from infancy to adulthood, communication was largely with others of the same sex and age. He writes:

> Traditionally in the village, a wife was not brought into the extended family for the personal satisfaction of the husband. Her important roles had to do with those which most benefited and extended the prestige of the larger family unit. Marriage and, to some extent, coital relations were regulated by the decisions of older family members.(1968:761).

Because of the very reason that the woman has a separate role to play in her new home, communication between husband and wife is reduced to a minimum (Davis, 1957:92). Stycos, Back and Hill (1956:213) stated on the basis of their research in Puerto Rico that

> The lack of communication on family planning would seem to be the consequence of at least two cultural factors.1.Female modesty inculcated early in childhood makes many women reluctant to bring up such matters; and leads males to conclude that such matters are not for discussion with their wives. 2. Male dominance leads some husbands to believe that the sphere of family planning is their prerogative alone, and makes wives reluctant to initiate conversation or action. Moreover, there is some evidence suggesting that when conversation does occur it tends to be one-sided; i.e, the male talking, the female listening.

They reported that about one-third of their respondents had never discussed family size with their spouses despite the fact that they had a favourable attitude toward family planning. The propensity for inter-spouse communication tended to be higher among younger and highly educated couples than among older and less educated ones. Poffenberger(1968:761) noted that in an Indian village husband-wife communication was influenced by the process of urbanization and modernization. Similarly, according to United Nations(1974:4) the Dacca Family Planning Experiment study conducted in a traditional male-dominated society found that increased age and duration of marriage, higher social class and increased education tended to increase communication between the spouses.

A comparative study on husband-wife communication and practice of family planning conducted in four countries (India, Iran, the Philippines and Singapore) by the United Nations(1974:5) attempted to determine the role of husband-wife communication and its effects on adoption of contraception. The finding of the study was 'Husband-wife communication appears to have an independent, direct effect, independently or in addition to whatever indirect effect it may have.'(United Nations, 1974:151).

In the CPS(1981) in Nepal, all currently married women were asked whether they had discussed with their husbands issues related to family size. In the Nepalese society, women are expected to produce children as soon as possible once the marriage is consummated to meet their mother-in-law's and their own interest. The type of family structure and the strength of the kinship system in Nepal and the wife's role as a daughter-in-law in a new home makes it virtually impossible to discuss with her husband such topics as sex and the number of children they want in the family.

As expected, the majority of currently married women in Nepal reported that they had never discussed family size with their husbands. Husband-wife communication existed among only one-fifth of the couples, according to the CPS(1981) data. The proportion of women who have had communication with their spouses was higher among the younger and educated than among the older and uneducated women. The majority of women who have communicated with their husbands were aged under 30, with less than three living children. An overwhelming majority of them were either working in farming or did not work at all. Approximately one-third were either Brahmins, Chhetris or

Newars.

TABLE 6.10: PERCENT OF EXPOSED WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY HUSBAND-WIFE COMMUNICATION ON FAMILY SIZE, EDUCATION AND AGE OF WOMAN, 1981.

Education and H-W communication	Age of woman 15-24	25-34	35-49	Total	Number of women
All women					
Yes	8.9	24.1	27.4	20.0	1047
No	0.9	4.9	7.0	4.5	4206
No Schooling					
Yes	6.4	18.7	26.0	16.9	887
No	0.6	4.5	6.4	4.1	4017
Some Schooling					
Yes	17.8	54.1	(49.1)	37.0	160
No	4.7	13.1	29.6	12.5	189

Note: Parentheses( ) indicate cell where denominator is less than 25 but more than 10 women.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

Table 6.10 presents the proportion of exposed women who are current contraceptive users by husband-wife communication, age and education. It is evident that the proportion of current users is much higher among women who have inter-spouse communication than among those who do not. Differences in the proportion of current users between these two groups continued while taking into consideration separately age and education, and age and work status (Tables 6.10 and 6.11). However, there was a small proportion of women who did not have such communication with their spouse and yet used contraception. This may not be an anomaly in a society where the decision is made by

the husband and his mother with or without the consent of the wife; effective inter-spouse communication is not always necessary for the adoption of contraception (Poffenberger, 1968:761). Poffenberger reported that in India some of the husbands who had a vasectomy operation, had not talked about it beforehand with their wives. Similarly, in Nepal, the wife is not required to sign the consent form if her husband is having a vasectomy operation. But the husband's signature on the consent form is required before the wife may undergo sterilization.

TABLE 6.11: PERCENT OF EXPOSED WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY WORK STATUS OF WOMAN, HUSBAND-WIFE COMMUNICATION ON FAMILY SIZE AND AGE OF WOMAN, 1981.

Work status and H-W communication	Age of woman 15-24	25-34	35-49	Total	Number of women
Farming					
Yes	8.7	15.8	16.7	13.8	363
No	0.2	3.2	4.0	2.6	1966
Non-farming					
Yes	8.0	28.8	47.0	25.4	127
No	0.4	8.6	10.6	7.2	401
No work					
Yes	9.3	28.6	31.0	22.8	555
No	1.7	5.8	9.4	5.9	1838

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

6.5 SOCIAL AND ECONOMIC FACTORS

6.5.1 EDUCATION

The proportion of current users varies greatly according to the educational status of the couples. Table 6.12 indicates that the prevalence rates are higher if the wife had some schooling than if she did not. Almost one-fourth of couples where both the husband and wife have some schooling are currently practising contraception whereas less than five percent do so if neither husband nor wife had any formal schooling.

TABLE 6.12: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY COUPLE'S EDUCATION , WOMAN'S EDUCATION AND HUSBAND'S EDUCATION, 1981.

Education	Number of women	Percent of current users
Couple's education		
Both have no schooling	3442	4.7
Husband with and wife without schooling	1473	10.4
Husband without and wife with schooling	46	13.4
Both have schooling	304	25.2
Not stated	11	-
Woman's education		
No schooling	4923	6.4
Some schooling	350	23.6
Not stated	3	-
Husband's education		
No schooling	3490	4.8
Some schooling	1778	13.0
Not stated	8	-
Total	5276	7.6

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

Although the contraceptive use rates vary according to husband's educational status, the difference in the proportion of current users is more pronounced if the wife's education is considered. Therefore, for the subsequent analysis, only the wife's education will be considered.

TABLE 6.13: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY EDUCATION AND AGE OF WOMAN, 1981.

	Education of woman	
Age of woman	No Schooling	Some Schooling
15-24	1.7	10.7
25-34	7.5	33.8
35-44	9.5	34.6
45-49	8.0	*
Total	6.4	23.6
Number of women	(4923)	(350)

Note: An asterisk (*) denotes cell where the denominator is less than 10 women.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

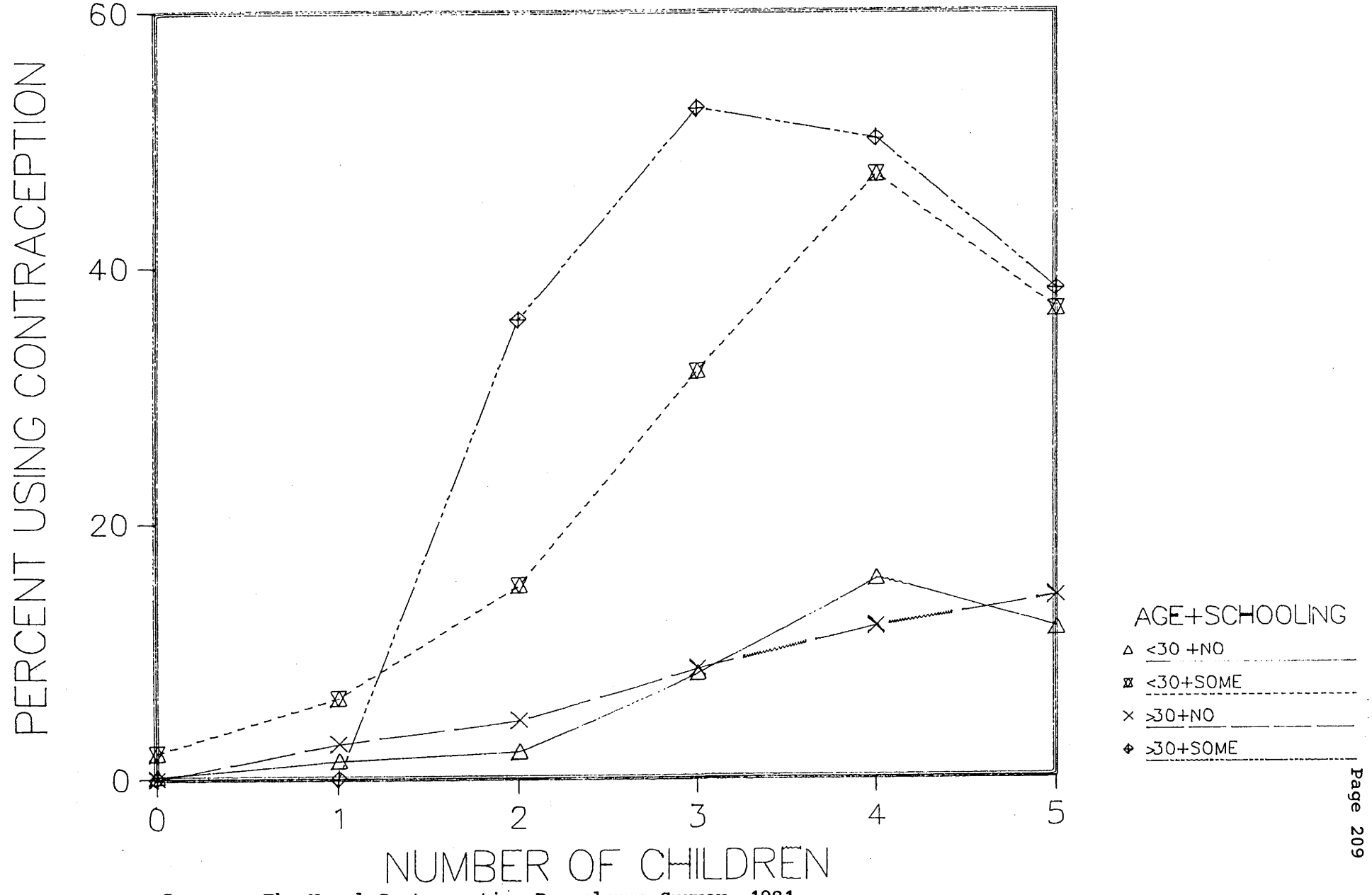
Table 6.13 shows that there are considerable differences in the use prevalence rates in all age-groups among those women who have had some schooling and those who have not. Practically only a minority of women, namely those with some schooling, use contraception. Among those with no formal education only about six percent do so. The differences are particularly striking at ages 25-34 and 35-44 where almost four times more use contraception among the 'some education'

group than in the 'no schooling' group. Both educated and uneducated women aged 15-24 years who are currently using contraception have, on average, 2.4 living children. More educated women tend to be housewives than uneducated ones. In addition, there is a higher proportion of educated than uneducated women in the urban areas. However, a majority of both educated and uneducated women reported that they have access to a family planning outlet within three hours' travel time. It should be noted that more than two-thirds of the educated women know an outlet whereas only one-third of the uneducated women do so. More educated than uneducated women desire to have no more children. Consequently, almost two-thirds of the educated women adopted sterilization while less than half of the uneducated women did so.

The rise in the proportion of current users between NFS(1976) and CPS(1981) was more substantial among women who have some schooling than among those with no schooling. The percentage of current contraceptive users among women with no schooling and some schooling were 2.5 and 11.4 respectively in 1976, and 6.4 and 23.6 in 1981. The increase in current use was almost 12 percentage points among the latter but only four percentage points among the former.

It has been noted that the number of living children is one of the important demographic factors that influence the proportion of current users. Education of women affects the prevalence rates rather less effectively than the number of living children. Taking these two variables, the joint effects on the proportion of current users can be seen in Figure 6.1. To reduce the effects of age, the data are for women aged under 30 and 30 years and over. The proportion of current

FIGURE 6.1: PERCENTAGE OF CURRENTLY MARRIED NOT PREGNANT WOMEN WHO ARE CURRENT USERS OF CONTRACEPTION BY AGE, EDUCATION AND NUMBER OF LIVING CHILDREN, 1981.



Source: The Nepal Contraceptive Prevalence Survey, 1981.

users increases consistently with number of living children except for those aged 30+ with five or more living children for each education group of women. The rise in the proportion of current users is more substantial among women who have some schooling than among those who have no schooling when age is controlled.

It is to be remembered that some percentages are based on small numbers and differences by age are not significant at five percent level in the same educational category. Therefore, one would have to correct the impression about cohort effect. It is unfortunate that many children are not sent to school just because of the need for their contribution to the family income (Hitchcock, 1966:52). Caplan (1970:78) found in his studies that only about one-third of Limbu boys and no girls aged from six to thirteen years were enrolled at the primary school. Those who were registered also went to school only when they were free from duties such as cattle minding and other farm-work. In order to send children to school, parents have not only to pay regular fees but they also incur additional costs for instance for school uniform. With the increased need for cash for meeting household expenses, it is unlikely that parents will put high priority on sending children, in particular girls, to school. Sending girls to school would definitely make an impact on acceptance of family planning in the future.

6.5.2 WORK STATUS OF THE WOMAN

Type of occupation is another factor that undoubtedly has influence on contraceptive use. Style of living is generally associated with the type of work women do. To study the influence of occupational differences in contraceptive prevalence rates, women are

categorized into three groups[14]. They are: farming, non-farming and no occupation (housewife). The non-farming group comprises production labourers (62 percent), sales and traders (17 percent), civil servants (seven percent) and others (12 percent). Level of educational status was not different for these groups (97 percent of farm workers, 91 percent of non-farm workers and 90 percent of housewives do not have any formal schooling).

The first panel of Table 6.14 presents the proportion of current users who are currently married and not pregnant, by occupation, and number of living children and age. Prevalence rates are generally higher among housewives and those who are involved in non-farming activities than those who are in farming. Differences in the level of current use are greater between farmers and non-farmers among older than among younger women. Among women aged 25-44 years, the proportion of users is slightly higher if they are involved in non-farm work rather than housework only. By age 45-49 years, these two groups have the same prevalence of contraceptive use. With regard to the number of living children, women in farming tend to have a lower rate of contraceptive use than those in non-farming activities. However, the proportion of current users does not differ between these two categories until they have three or more living children (Second panel of Table 6.14). Even women involved in non-farming activities are not likely to practise family planning until they have had at least three surviving children. In families with two surviving

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[14] A more detailed categorization might be desirable but the sample size is not large enough to do so and still retain an adequate number of observations in each cell.

children, housewives are slightly more likely to be current contraceptive users than the other two groups of women.

TABLE 6.14: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY WORK STATUS OF WOMAN, AGE OF WOMAN AND NUMBER OF LIVING CHILDREN, 1981.

Demographic Characteristics	Work status of woman		
	No work	Farming	Non-farming
Age of woman			
15-24	3.7	1.6	2.7
25-34	11.8	5.7	14.0
35-44	13.8	5.3	17.3
45-49	10.6	6.0	10.8
Number of living children			
0	0.5	0.0	0.0
1	1.9	2.3	1.1
2	5.9	3.2	2.5
3	13.5	5.8	19.6
4	18.1	9.6	22.7
5 or more	20.0	7.7	21.3
Total	9.8	4.4	11.5
Number of women	2404	2336	531

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

It is generally the case that occupation is related to education. If a woman is involved in non-farming activities, it is more likely that she has had some schooling. This is not the case in Nepal because the non-farming group comprises mostly unskilled workers with little education. Therefore, the difference in prevalence rates by occupational status may be independent of the effects of women's education. In Table 6.15, the proportion of currently married and not pregnant women currently using contraception is presented by

occupation and education, controlling for age. The data indicate that occupational status of women is an important factor in explaining the level of contraceptive use, though less powerful than education of the women. In an agrarian society, a larger family is considered an economic advantage. There is a need for extra hands not only during

TABLE 6.15: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY WORK STATUS OF WOMAN AND EDUCATION OF WOMAN CONTROLLING AGE OF WOMAN, 1981.

Work status of woman	Education of woman: No schooling	Some schooling	Total
		All Ages	
No work	8.3	23.6	9.8
Farming	4.1	13.4	4.4
Non-farming	9.0	37.6	11.5
		Less than 30 years	
No work	3.6	17.5	5.6
Farming	2.5	7.3	2.7
Non-farming	5.4	16.6	6.6
		30 years or more	
No work	12.7	38.4	14.2
Farming	5.8	(22.9)	6.1
Non-farming	12.5	(72.7)	16.6

Note: Parentheses() denote cell where the denominator is less than 25 but more than 10 women.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

the planting and harvesting seasons but also when the family needs cash income. While children are young, they look after the household and take care of smaller children while adults go to the field (Nag,

et al.,1978:295-296). Nag, White and Peet(1978:297) have found that large families are economically better-off than small families for two reasons. First, children in large families are encouraged to participate in all types of productive activities at an earlier age. Second, the older children in large families can be involved in more productive work while younger children take other activities. Benefits of having a large family have also been shown in Limbu society. Caplan(1970:81) found that a household with two adults and no children produces 57 percent of its food requirements whereas a household with three adults and six children aged from one to fourteen years produces 152 percent of its annual food requirements. In far-western Nepal, McDougal(1968:27) indicated that a large family tends to have a bigger landholding.

In rural Nepal, it is very difficult to get hired labour as every family has at least a small plot of land (Hitchcock, 1963:81). Men are generally away from home seeking jobs which will earn cash income and women and children are left at home. Women in Nepal spend most of their time doing house work which covers a wide range of duties. Pande et al.(1981:199) report that household duties cover care and maintenance of the house, taking care of children, gathering food, water, firewood, taking care of animals, milking and grazing cattle. Besides the work shared by men and women, certain tasks during the planting and harvesting seasons are set aside for women only. In a family where there are children, some of these tasks are performed by children. Women then can be freed to participate in the type of work that can bring cash income or payment in kind, such as grains. Hitchcock(1966:49) points out:

Parents hope for as many children as possible. Their usefulness as labor and as supports in old age are more important than their cost as additional mouths to feed and bodies to clothe.

6.5.3 ETHNICITY

As mentioned earlier, there are more than 75 ethnic groups in Nepal. Many of them are small in size and it is therefore not feasible to analyse their level of contraceptive use. Only the major ethnic groups, the Brahmins, Chhetris, Tharus, Magars, Newars, Tamangs, Gurungs, Rais, Thakuris and Muslims are considered here for analysis.

TABLE 6.16: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY ETHNICITY AND SELECTED BACKGROUND CHARACTERISTICS, 1981.

	Age of Woman		Number of Children		Number of living Sons		Education of woman		
Ethnicity	less than 30yrs.	30yrs. or more	2 or less	3 or more	1 or less	2 or more	No Schooling	Some	Total
Newars	7.5	28.5	6.9	30.7	7.9	33.6	16.9	29.7	19.4
Brahmins	8.9	21.2	7.0	21.7	8.4	21.5	12.3	24.3	14.6
Chhetris	6.2	16.6	3.0	20.9	3.8	21.3	9.6	26.5	11.6
Thakuris	4.0	9.2	2.2	9.8	0.5	15.0	6.6	*	6.6
Tharus	5.5	4.7	0.9	9.5	2.8	8.6	4.8	(10.9)	5.1
Magars	4.7	4.7	1.9	8.4	1.7	8.9	4.3	(11.4)	4.7
Gurungs	1.1	6.4	1.1	6.4	0.6	9.5	3.3	*	3.8
Rais	0.5	4.8	0.0	3.9	2.3	4.0	3.2	*	3.1
Tamangs	6.1	0.0	1.6	1.6	1.7	3.4	2.4	*	2.4
Muslims	1.6	2.0	0.0	4.0	0.0	4.5	1.1	*	1.8

Notes: An asterisk (*) denotes cell where the denominator is less than 10 women and parentheses() denote cell where the denominator is less than 25 but more than 10 women.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

There is a substantial difference in the proportion of current users among various ethnic groups (Table 6.16). The highest prevalence rates are found among the Newars followed by the Brahmins and the Chhetris. The proportion of the current users is lowest among Muslims. Similar differences in the pattern of current use were found in an earlier study: high caste groups, such as Newars, Brahmins and Chhetris had higher prevalence rates than other castes (Anthony, 1979:160). Variation among various ethnic groups in contraceptive use prevalence rates are quite large among women aged 30 years and more, among those who have three or more surviving children, but also among women with some education. In contrast, younger age, less than three surviving children and, to a lesser extent, no formal education appear to have less discriminatory power in that respect.

6.6 AVAILABILITY OF AND ACCESS TO FAMILY PLANNING SERVICES

In comparative studies based on the World Fertility Survey data of five countries, G. Rodriguez(1978:100-115) and J. Brackett(1980:19-49) indicated that a high level of contraceptive use is associated with greater availability of and easier access to family planning services. Rodriguez's analysis shows that a lack of knowledge about the availability of family planning services and inaccessibility of such services are related to the very low level of contraceptive use in Nepal.

In the 1981 Nepal Contraceptive Prevalence Survey(CPS), information on availability of and accessibility to family planning was collected for every modern method the woman knew; similar information was sought in the NFS(1976) for any one of the family planning methods. During that five year gap, a number of changes in family planning delivery has taken place to increase the number of service outlets. These two sets of data provide an opportunity to assess the extent to which things changed. For this comparison, women were categorized as having the 'knowledge of availability' if they reported that they knew of an outlet for any of the modern methods. In this way, the categories in the NFS(1976) and the CPS(1981) were made comparable. Having access to any one of the modern contraceptives (accessibility) was expressed in terms of travel time needed to reach the nearest outlet. Before we deal with the knowledge of availability and accessibility , it is worth looking at urban-rural differentials first. This is followed by discussion of changes in the knowledge of availability and accessibility between 1976 and 1981.

6.6.1 PLACE OF RESIDENCE

There is a distinct differential in the level of contraceptive use between urban and rural women(Table 6.17). The family planning programme started first in the Kathmandu valley where more than half of the urban population of Nepal resides(Tuladhar,et al., 1978:64). As explained earlier, family planning services were gradually made available outside the cities only after 1969. However, in many parts of rural Nepal family planning first became available after 1976, with the introduction of the Panchayat-based services. Therefore, it is not surprising to find such a difference in use prevalence between urban and rural areas. Moreover, urban areas have several outlet points: hospitals, health centres and family planning centres, all of which provide family planning services. In addition, condoms and oral pills can be bought from local pharmacists. General stores also sell condoms. Because of the easy access to modern health care and hospital facilities in urban areas, infant mortality is also lower than in rural areas[15].

The proportion of current users is four times higher among urban than rural women (Table 6.17). Differences in the level of current use are still wide while controlling for age of the women: the proportion of current users among urban women is more than three times that found among the rural women in each age-group.

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[15] During the 1970-74 period, urban and rural areas had infant mortality rates of 112 and 157 respectively(Thapa and Rutherford, 1982:75).

TABLE 6.17: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY PLACE OF RESIDENCE, AGE OF WOMAN , NUMBER OF LIVING CHILDREN, NUMBER OF LIVING SONS AND GEOGRAPHICAL REGION, 1981.

Selected Variable	Place of residence	
	Rural	Urban
Age of woman		
15-24	2.1	11.1
25-34	8.1	28.4
35-44	8.7	35.1
45-49	7.2	30.2
Number of living children		
0	0.1	3.1
1	1.8	6.6
2	3.4	19.8
3	8.7	34.2
4	13.4	38.7
5 or more	13.4	42.4
Number of living sons		
0	0.5	6.6
1	4.7	16.5
2	9.8	44.3
3 or more	15.9	40.2
Geographical region		
Mountains	6.0	-
Hills	5.4	32.0
Plains	7.4	21.2
Total	6.5	25.7
Number of women	4970	305

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

The second panel of Table 6.17 presents the proportion of current users among exposed women by place of residence and number of living children. A negligible proportion of rural women practise

contraception among those who have two or less surviving children, and there is little difference between rural and urban prevalence rates. Differences in the proportion of rural and urban users increase as the number of surviving children increases. The proportion of current users increases dramatically among urban women with more than two living children whereas the increase is comparatively small among rural women. With regard to the number of living sons, the proportion of current users increases consistently among rural women but the pattern is different among urban women (third panel of Table 6.17). A substantial increase in the level of contraceptive practice among urban women starts after having one living son. By the time the women have two sons, almost a half would have accepted family planning.

TABLE 6.18: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY PLACE OF RESIDENCE, AGE OF WOMAN CONTROLLING FOR EDUCATION OF WOMAN, 1981.

Place of residence	Education of woman: No Schooling	Some Schooling	Total
	All ages		
Rural	5.9	17.7	6.5
Urban	19.5	39.6	25.7
	Less than 30 yrs.		
Rural	3.0	12.6	3.7
Urban	9.7	25.6	15.8
	30 yrs. or more		
Rural	8.6	30.0	9.3
Urban	27.4	62.3	35.6

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

Table 6.18 suggests that differences in contraceptive use between urban and rural women are to a limited extent due to variation in educational level. Even allowing for cohort and educational effects, the proportion of current users is still higher among urban than rural women. The urban-rural differential almost disappears among uneducated women with less than two living children (Table 6.19). In the urban areas where there is less opportunity for the children to do farm-work and make a contribution to the family's economy, the cost of raising a large number of children may play a role in the family's decision to adopt contraception. In urban areas, children are also more likely to be sent to school. This is not an unusual phenomenon as better educated parents are more likely to be found in urban areas, and they will have an interest in educating their children. This was documented, for example, in Ghana, where parents feel they are obliged to educate their children because there are fewer jobs for those who have no education (Caldwell, 1968:103). Once a child is sent to school, there is a direct cost involved, such as purchasing books, pencils, copy-books, school uniform, providing transportation, tiffin and paying tuition fee. More than half of boys and more than one-third of girls aged 6-14 years attended school in urban areas in 1971. In contrast, only one-fifth of boys and less than five percent of girls did so in the rural areas (CBS, 1977:137). Moreover, there is a higher cost to protect children's health in urban areas. Urban residents may be more conscious about the health of their children and seek help more often than rural residents.

TABLE 6.19: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO ARE CURRENT CONTRACEPTIVE USERS BY PLACE OF RESIDENCE AND NUMBER OF LIVING CHILDREN CONTROLLING FOR EDUCATION OF WOMAN, 1981.

Education and place of residence	Number of living children						
	0	1	2	3	4	5 or more	Total
All women							
Rural	0.1	1.8	3.4	8.4	13.4	13.4	6.5
Urban	3.1	6.6	19.8	34.2	38.7	42.4	25.7
No Schooling							
Rural	0.2	1.7	2.8	7.7	11.6	12.8	5.9
Urban	0.0	2.1	13.0	22.7	31.2	35.6	19.5
Some Schooling							
Rural	0.0	2.9	14.0	30.0	44.4	28.6	17.7
Urban	(9.6)	(16.7)	(29.9)	52.3	(64.4)	(70.8)	39.6

Notes: An asterisk (*) denotes cell where the denominator is less than 10 women and parentheses( ) denote cell where the denominator is less than 25 but more than 10 women.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

There seems to be no substantial difference in the proportion of current rural users of contraception among the three geographical regions (Mountains, Hills and Plains). However, within urban areas, contraceptive use is clearly higher in the Hills than in the Plains (Fourth panel of Table 6.17).

Variation in the contraceptive prevalence rates between urban and rural areas may be expected if the family planning programme is not equally good in these two areas. In South Korea where the family planning programme is successful, the rural-urban differential in current use is very small(Rodriguez, 1978:108). The same is true in

Malaysia(Peng and Abdurahman, 1981:17) and in Indonesia (1978:76). In Nepal, availability of and access to family planning services has been obviously one of the crucial limitations to a wider spread of contraceptive use.

6.6.2 KNOWLEDGE OF AVAILABILITY AND ACCESSIBILITY

Three factors, namely the length of time the programme has been in place, the geographic dispersion of outlets and the overall quality of services have an important bearing on use prevalence among women who know where to get a family planning method(Brackett, 1980:27). There is no doubt that family planning service outlets are very sparse in Nepal. The contraceptive method of the woman's choice is often not available at the outlet to which she has comparatively easy access. As shown earlier, many couples demand sterilization. Occasionally, the National Family Planning office and the Family Planning Association have attempted to provide male sterilization in mobile camps in which a team including a medical doctor moves from one village to another to perform sterilizations. Although the quality of the performance is quite satisfactory, this type of service is impossible to provide regularly due to lack of trained medical doctors.

We have noted in Chapter 5 that the Nepalese family planning programme is basically a community oriented programme. The programme should avoid such situations as cancellation of an organized sterilization camp at the last moment. One of the district family planning officers told me his sad experience. A number of motivated women came to the district headquarters to have a laparoscopy a week before the camp was to be held. They came from a long distance,

walking for two days or even more. Those women who come a long way from home have to make preparations before they leave their homes. The cattle have to be looked after by neighbours or friends who are willing to do so during their absence. Once they have left their homes, it will take at least a week before they return after the operation, and they have to carry food for that period. Hundreds of men, women, and children gathered two days before the camp was to be opened. One day before the opening, the family planning officer received a cable informing him that the camp had been postponed. No wonder that not only do the people get a bad impression of the programme administration, but also at least some may change their minds and not return the next time when the camp is held.

Another factor that indirectly affects the level of contraceptive use is the quality of the services provided. In the eastern Hills, a district medical doctor performed vasectomy sterilization on 64 men. A year later, the wives of all the 64 men who were supposed to have been sterilized had become pregnant. Obviously some of these women might be suspected by their husbands of having affairs with other men; this must have created a great deal of tension between husbands and wives. Later, when the news about this incident was published in a newspaper, a laboratory test was conducted on all the men by the Government Family Planning Project. It was found that none of them was sterilized. The medical doctor who performed the sterilizations admitted that he did not cut the vas, but only tightened it up[16]. Such instances, though they do not happen frequently, have undoubtedly a negative impact on the family planning programme large enough to

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[16] This case is reported here based on information available to author while he was working as the Chief of Planning, Research and Evaluation Division.

retard its success.

In the last five years, there has been a steep increase in the knowledge of availability of contraceptive services. Table 6.20 shows that in 1981 about one-third of the exposed women knew where to get modern contraceptives in contrast to only about six percent in 1976. Similarly, the services became more easily available as the distance that a woman has to travel to get family planning services has been reduced. In 1976, a little over half of the women who knew of an outlet had to travel more than three hours[17] in contrast to less than one-fourth in 1981. The proportion who needed to walk not more than two hours has increased from 42 percent in 1976 to 63 percent in 1981 which is quite an improvement. However, the proportion who have to walk an hour or less still remains virtually the same. As expected, the pattern of accessibility is quite different between rural and urban areas. It indicates that 42 percent of the rural women have to walk two to three hours to get contraceptives, and only 21 percent can get them locally (within half an hour) (Appendix 6.1). In contrast, 87 percent of the urban women have to walk not more than a half-hour to get contraceptives. As a result of this uneven distribution of outlets, more than half of the rural women feel family planning service cannot be reached conveniently while less than one-tenth of the urban women feel so (Table 6.21). It is to be noted

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[17] This includes 25 percent of those who did not know how far an outlet was. Here, I assumed that these women, most probably, lived too far away. This latter proportion was reduced to only three percent in the CPS(1981).

that the majority (59 percent) of the rural women who feel it inconvenient to reach outlets are living as far as three hours or more away.

TABLE 6.20: PERCENT DISTRIBUTION OF TRAVEL TIME AMONG WOMEN WHO KNOW AN OUTLET; AND PERCENTAGE OF CURRENTLY MARRIED WHO KNOW A FAMILY PLANNING SERVICE OUTLET IN 1976 AND 1981.

	NFS 1976[1]		CPS 1981[3]	
Perceived availability and accessibility	Number of women[2] (5501)	Percent	Number of women (5276)	Percent
Percent who knew an an outlet	319	6	1737	33
Of those who knew an an outlet				
Less than one hour	77	24	496	29
One hour	32	10	224	13
Two hours	25	8	364	21
Three hours	22	7	294	17
More than three hours	83	26	310	18
Don't know how far	80	25	49	3
Percent within one hour	109	34	720	41

Sources: [1] Rodriguez , G.(1978), 'Family Planning Availability and Contraceptive Prevalence', INTERNATIONAL FAMILY PLANNING PERSPECTIVES AND DIGEST, 4(4):100-115.

[2] Number of women is calculated based on total number of women given.

[3] The Nepal Contraceptive Prevalence Survey Data,1981.

TABLE 6.21: PERCENTAGE DISTRIBUTION OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO KNEW AN OUTLET ACCORDING TO PERCEIVED TIME REQUIRED TO TRAVEL TO AN OUTLET, PLACE OF RESIDENCE AND EASE IN REACHING AN OUTLET, 1981.

Perceived time required to travel to reach outlet	Place of residence					
	Urban			Rural		
	Ease in reaching outlet			Ease in reaching outlet		
	convenient	inconvenient	Total	convenient	inconvenient	Total
Within half-hour	91.6	53.7	88.1	36.5	12.3	20.9
One-two hours	7.0	15.9	7.8	45.0	28.5	37.3
Three hours +	1.4	30.4	4.1	18.5	59.2	41.8
Total	90.6	9.4	100.0	47.1	52.9	100.0
Number of women	180	18	198	724	815	1539

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

Though a panchayat-based worker who supplies condoms and oral pills is stationed in the village panchayat, due to the topography of the country it often requires a long walk to get from one end of the panchayat to the other. A village panchayat consists of nine wards. Each ward may comprise more than one village. Usually Nepalese villages are scattered and a border line is drawn along a river. Travel becomes nearly impossible during the monsoon season. This difficulty applies to the women, potential users, as well as to the family planning workers. A report of the Ministry of Health(1979:48) stated that panchayat-based workers assigned to the village panchayat

have not yet visited two-thirds of the households one to two years[18] after their appointment(Ministry of Health, 1979:48,234). Consequently, many of the potential users and women interested in family planning have not yet been reached.

According to the instructions given to the family planning field-workers, all family planning acceptors have to be followed up. The follow-up, however, is very poor. The field-workers do not carry out regular follow-up visits even of those acceptors who are within half an hour's distance from the family planning service outlet. Our data reveal that only a little more than one-fourth of the current users who lived close to an outlet, and about one-fifth of those who lived further away were visited by family planning staff during the last three months (Table 6.22).

TABLE 6.22: PERCENTAGE DISTRIBUTION OF CURRENT CONTRACEPTIVE USERS ACCORDING TO FOLLOW-UP VISIT IN THE LAST THREE MONTHS BY TRAVEL TIME TO A FAMILY PLANNING SERVICE OUTLET, 1981.

Follow-up visit in the last three months	Travel time to an outlet: Within half-hour	More than half-hour	Don't know	Total
Yes	27.4	19.8	100.0	24.9
No	71.7	79.6	-	74.4
Not stated	0.9	0.6	-	0.7
Total	100.0	100.0	100.0	100.0
Number of women	178	199	23	400

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

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[18] One to two years is a modal group. 18 percent of the PBHWs' have been working for one year, 73 percent for 1-2 years and nine percent for two years or more (Ministry of Health, 1979:234).

The rise in the levels of availability and perceived accessibility between 1976 and 1981 and the examination of the urban-rural differentials indicate that the family planning programme has made considerable improvement in increasing knowledge of family planning outlets both in urban and rural areas. However, the programme has still a long way to go before services become as accessible in the rural as they are in the urban areas; and this will be a very difficult task given the terrain of parts of Nepal.

The highest level of knowledge of an outlet of a family planning method was found among the women aged 25-34, those with four or more surviving children, with three or more surviving sons, having some schooling and having non-farming occupations (Appendix 6.2). It was highest among upper-caste women (Brahmins and Newars), among those who want no more children and among women who had good communication with husband. Because many of these characteristics are interrelated, there is need for controlling for at least some of them before assessing the importance of individual characteristics. Differences in the level of such knowledge between women with no schooling and those with some schooling persist even when controlling for the number of living children though the differences become smaller among the women with smaller numbers of living children (Table 6.23). Education of women continued to have an effect on the level of knowledge of availability when controlling for occupational categories and place of residence (Table 6.24). This is similar to what Rodriguez found on the basis of the WFS data. He indicated that after controlling for selected demographic variables and place of residence, educational differentials persisted (Rodriguez, 1978:104).

TABLE 6.23: PERCENTAGE OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO KNEW A FAMILY PLANNING SERVICE OUTLET BY NUMBER OF LIVING CHILDREN AND EDUCATION OF OF WOMAN, 1981.

Number of living children	Education of woman: No Schooling (N)	No Schooling Percent	Some Schooling (N)	Some Schooling Percent	Total
0	817	24.5	62	53.1	26.5
1	849	27.6	59	60.9	29.7
2	927	29.9	76	69.1	32.8
3	822	32.5	63	78.6	35.7
4	612	34.3	44	75.2	37.0
5 or more	894	34.5	46	78.9	36.7
Total	4921	30.0	350	68.6	32.9

Note: N indicates number of women.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

TABLE 6.24: PERCENT OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO KNEW A FAMILY PLANNING SERVICE OUTLET BY WORK STATUS OF WOMAN AND PLACE OF RESIDENCE, AND BY EDUCATION OF WOMAN, 1981.

Selected characteristics	Education of woman: No Schooling (N)	No Schooling (%)	Some Schooling (N)	Some Schooling (%)
Work status of woman				
No work	2162	26.9	241	68.2
Farming	2271	30.9	62	59.7
Non-farming	484	43.8	47	82.3
Place of residence				
Rural	4712	29.3	256	62.1
Urban	211	55.3	95	86.3

Note: N indicates number of women.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

The proportion of exposed women who knew a family planning outlet was slightly higher among those who were involved in non-farming than in the other two occupational groups. Between the 'farming' and 'not working' groups, the level of knowledge of availability was higher for the latter (largely housewives) among the educated group. There was very little difference between these two groups among the uneducated women.

A marked difference exists in the proportion knowing of a family planning outlet among the different ethnic groups. High caste ethnic groups, largely urbanized and better educated, have a higher level of knowledge of an outlet. However, even in the rural areas, two of these three high-caste groups (Newars and Brahmins) dominate in their knowledge of family planning outlets. The Muslims living largely in the Plains where there are relatively more family planning outlets have a higher level of knowledge of availability than the other groups. Within each ethnic group, generally women with any formal schooling, having non-farm occupation, those with urban residence, having good communication with husband and desiring no more children have higher level of knowledge of availability of family planning services than those of opposite characteristics (Appendix 6.3).

6.6.3 CONTRACEPTIVE USE AND ACCESSIBILITY

Less than one-third of the current users live within a half-hour's walking distance to an outlet (Table 6.25). Twenty women who did not know an outlet claimed to be using contraception. Almost all of them were aged over 30 years, with three or more surviving children and having at least one child of each sex. The majority of

them did not have any formal schooling and had no occupation other than household chores. They were almost all from rural areas, with no inter-spouse communication. Almost three-fourths of them were protected by using condom or sterilization.

TABLE 6.25: DISTRIBUTION OF CONTRACEPTIVE CURRENT USERS BY KNOWLEDGE OF A FAMILY PLANNING SERVICE OUTLET AND TRAVEL TIME TO REACH AN OUTLET, 1981.

Travel time to an outlet	Number of current users	Percent
Less than 30 mins.	123	30.9
30 mins.	55	13.8
One hour	50	12.6
Two hours	57	14.3
Three hours	35	8.8
Four hours or more	57	14.3
Not stated	1	0.3
Don't know an outlet	20	5.0
Total	398	100.0

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

As stated before, a family planning service outlet is often difficult to reach in non-urban areas because of the topography and terrain of the country. According to population per service outlet, there is, as planned, one service outlet for approximately 4000-5000 population, that is, an average village panchayat size. The majority of these outlets are good only for those who require temporary methods such as condoms and oral pills and these are demanded by less than one-fourth of the current users. Clinical methods like male and female sterilization, depo-provera and IUD are available only in

hospitals. Hospitals are far more difficult to reach for rural residents. There are 62 hospitals for 15 million people in the

TABLE 6.26: PERCENTAGE OF CURRENTLY MARRIED, NOT PREGNANT WOMEN KNOWING AN OUTLET WHO ARE CURRENTLY USING CONTRACEPTION BY TRAVEL TIME TO REACH AN OUTLET, 1981.

Travel time to an outlet	Number of women	Percent of current users
Less than 30 mins	321	38.3
30 mins.	175	31.5
One hour	224	22.3
Two hours or more	968	15.4
Don't know time	49	2.6
Total	1737	21.8

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

country[19]. Many of the hospitals in the remote districts do not have medical doctors all the year round. The only successful camps were in the Plains, leaving the vast majority of eligible couples in the Hills and Mountains without adequate services. The proportion of current users slowly decreases with increased distance to travel to reach an outlet (Table 6.26). The differentials in current use by education and place of residence have almost disappeared once we concentrate on the women who have access to a family planning outlet within a half-hour's travel time (Table 6.27). However, wife's occupation and husband-wife communication continued to have effects on current use. Needless to say, desire for additional children or lack

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[19] 31 out of the 62 hospitals are located in urban areas.

TABLE 6.27: CURRENTLY MARRIED, NOT PREGNANT WOMEN CONTRACEPTING AND KNOWING A FAMILY PLANNING SERVICE OUTLET, BY SOCIO-ECONOMIC STATUS, DESIRE FOR MORE CHILDREN, HUSBAND-WIFE COMMUNICATION AND TRAVEL TIME TO AN OUTLET, 1981.

Selected Characteristics	Travel time to an outlet: Half-hour or less	Travel time to an outlet: More than half-hour	Total
Education of woman			
No schooling	34.7	15.7	19.8
Some schooling	38.9	27.7	33.8
Work status of woman			
No work	39.2	21.9	29.1
Farming	28.1	11.7	13.9
Non-farming	33.4	18.0	23.3
Place of residence			
Rural	33.3	16.4	19.6
Urban	40.6	(30.0)	38.9
Desire for more children			
Desire more	9.3	3.5	4.8
Desire no more	55.2	32.9	39.9
Husband-wife communication			
Yes	48.9	32.2	39.3
No	25.4	11.7	14.4

Notes: Parentheses() indicate cell where denominator is less than 25 but more than 10 women.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

of it remained the strongest factor in determining the use of contraception.

CHAPTER 7

DETERMINANTS OF CONTRACEPTIVE USE IN NEPAL

7.1 INTRODUCTION

In the preceding chapter, the relationship between contraceptive use and selected background variables was examined separately for each variable. In most instances, a limited number of other variables was statistically controlled using cross-tabulations. In this chapter, I shall examine the effects of individual demographic and socio-economic variables on current contraceptive use when all other variables are simultaneously controlled. The present analysis is confined only to exposed women who knew an outlet. Women who did not know an outlet are less likely to be using contraception[1]. This chapter will be presented in three sections. Following the introductory section, a brief outline of the methodology and the analysis will be presented. An explanation of the basic statistics used to interpret the findings will also be given. The third section will discuss the findings of the study in five sub-sections: (1) Demographic, (2) Desire for no more children, (3) Husband-wife communication on family size, (4) Socio-economic effects, and (5) Place of residence and access to family planning service outlets. In contrast to the previous chapter, the effect of each of the variables will be assessed while controlling

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[1] Analysis has also been carried out using exposed women wanting no more children and knowing a family planning service outlet. Patterns of contraceptive use in that analysis were found to be identical to those discussed in this chapter. Selected results are presented in Appendices 7.2 to 7.6.

for the previous variables. Variables were ordered and introduced in the model based partly on assumed causal ordering and partly on the aims of the study.

7.2 METHOD OF ANALYSIS

To study the determinants of contraceptive use in Nepal, I shall use Generalized Linear Model which is a modified multiple regression approach developed by Goodman(1971:33-61 and 1972:28-46). As with ordinary regression analysis, there are two parts to this model: systematic component and error structure.

In a generalized linear model, the systematic component is formed by selecting an appropriate link function which does the transformation of data. Transformation using logarithms performs two functions: firstly, non-linear coeffients are changed to linear, and secondly, it ensures that each observation or cell has equal variance. Illustrated examples of these transformation procedures can be seen in Nelder and Wedderburn (1972:370-384). An appropriate transformation for cross classifications of proportions where the dependent variable is dichotomous is the logit(or log-odds) function. This link function leads to a logistic regression model or logit-linear model. It ensures that the fitted value for each observation lies between zero and one.

With regard to error structure, normal error structure is not suitable for a logit-linear model. As the use of contraception is a dichotomous dependent variable, a binomial distribution is the most appropriate.

There are several advantages in using the Generalized Linear model over the ordinary linear model. They are: (1) dependent and independent variables can be categorical (e.g. dichotomous and polytomous), (2) since non-normal structures are permitted, the method does not object to having skewed dependent and independent variables, (3) the problem of homoscedacity does not arise, and (4) it provides an index analogous to multiple correlation coefficient (Goodman, 1972:42).

Many demographers have used this approach in recent years to study the determinants of contraceptive use (Tsui, et al., 1981:615-626, and Hogan, et al., 1981:597-614), fertility (Hobcraft, et al., 1982:1-69) and infant mortality (Frenzen, et al., 1982:391-408). Pullum (1980:225-244) used this model to identify the cohort and period effects on White fertility in the United States. Little (1978:47) applied it to the analysis of the Fijian Fertility Survey data on ever use and current use of contraception.

In the following analysis, all the proposed models were fitted using a computer program called GLIM-version 3 (Generalized Linear Iteractive Modelling) (Gilchrist and Green, 1980:1-59). Input data required for GLIM were generated by producing a number of matrices cross-tabulating current use of contraception by the independent variables in the model used in this study. It should be noted that cells which cannot have valid cases were excluded from the analysis before fitting the logit-linear model. The selection and introduction of variables to be tested in accordance with the given hypothesis is

guided by the principle that the current model[2] is a parsimonious one which includes the smallest number of factors in the model. With the selection of binomial error distribution, the default link is a logit-link function in GLIM. It should be noted that whenever a variable appears in an interaction term, its main effect is also assumed to be present in the model. Therefore, all the models considered are only of hierarchical type. The two important statistics produced by GLIM are the scaled deviance and the parameter estimate with its standard error. The scaled deviance which is distributed asymptotically indicates how well the proposed model explains the data. Adena and Wilson (1982:17) suggested that the Chi-square distribution is a general guide in assessing goodness of fit. The Chi-squared value is also used to assess the relative impact of the selected variables on the current use of contraception by comparing two models. A difference in degrees of freedom of the two models is the degree of freedom relating to the test variable. The parameter estimates, the log-odd ratios can be interpreted as an assessment of the differences between the categories of the variable. It is to be remembered that the log-odd ratios are calculated relative to the standard category. Thus, the standard category will have zero log-odd ratio which becomes difficult to interpret. Since it is easier to interpret data in their natural scale, the interpretation of

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[2] There are two types of models: the full model is one which has all main and interaction terms; the current model is one which can have some or any terms from the full model.

data is based on odd-ratios[3]. For instance, if odds value is greater than unity, the probability of being a current user is higher than that of being a non-user.

7.3 FINDINGS

7.3.1 DEMOGRAPHIC EFFECTS ON CONTRACEPTIVE USE

The effects of each of the demographic factors on contraceptive use are examined first. Table 7.1 indicates that there is a significant drop in the chi-squared value[4] when the variable age is introduced. The addition of the variable, 'number of living children', further substantially improves the model. The drop in the chi-squared value is by almost 32 percent[5]. The inclusion of the sex composition of living children in the model further improves the fit. However, the chi-squared value pertaining to the addition of the

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[3] Instead of measuring in relative effects which would not allow us to interpret the standard category, estimated standardized odds-ratios are calculated based on log-odds ratios. Mathematical formulas for conversion are given in Appendix 7.1. This method was suggested by Professor Thomas Pullum in personal communication while he was in Canberra.

[4] The overall scaled deviance, X^2 is 306.3 with 107 degrees of freedom when only a grand mean is assumed to be present in the model.

[5] Scaled deviance, X^2 equals 262.5 with 105 degrees of freedom when grand mean and age terms are in the model. After adding number of living children in the model, X^2=178.8 with 103 degrees of freedom. Therefore, the percentage drop=(262.5-178.8/262.5)x100 =31.9.

TABLE 7.1: LOGIT-LINEAR MODELS OF MAIN EFFECTS OF DEMOGRAPHIC FACTORS ON CURRENT CONTRACEPTIVE USE IN NEPAL, 1981

Demographic Variable	Number of women (1737)[2]	Effects			
		X^2_{LR}	P	Odds-ratio	Adjusted proportion
Age of woman		43.8	<.001		
15-24	492			0.465	0.1136
25-34	725			1.230	0.2531
35-49	518			1.547	0.2988
Number of living children[1]		83.7	<.001		
0-1	501			0.310	0.0787
2-3	648			1.044	0.2234
4 or more	588			2.585	0.4159
Sex composition of living children[1]		46.7	<.001		
All sons	283			1.347	0.2707
Sons > Daughters	352			1.702	0.3192
Sons = Daughters	533			1.171	0.2439
Sons < Daughters	326			0.985	0.2134
All daughters	230			0.217	0.0564
Number of child losses[1]		6.1	0.050		
0	1026			1.129	0.2372
1-2	538			0.793	0.1793
3 or more	162			1.001	0.2162

Notes: [1] Controlled for all previous factors
[2] Total may not add up to 1737 because of 'not reported' and 'don't know' cases in some variables
X^2_{LR} =Chi-squared likelihood ratio
P =level of significance

Source: The Nepal Contraceptive Prevalence Survey 1981.

number of dead children into the model does not provide a statistically significant improvement at one percent level of significance. The logit-linear model which consists of these three terms, age, number of living children and sex composition of living children explains more than half of the variation around the grand mean. Scaled deviance X^2_u drops from 306.3 to 110.8 with 94 degrees of freedom when age, number of living children, sex of living children and interaction term between number and sex of living children are considered in the model.

Figure 7.1 presents the parameter estimates of the main effects of age, number of living children and sex composition of living children and child losses on current contraceptive use. Effects are measured relative to the standard categories (age 15-24; 0-1 living children; all sons and no child lost). Standard categories are assigned a value of zero (equal to 1 in the natural scale). Figure 7.1 shows that the prevalence of contraceptive use varies most with sex of the living children and number of living children.

The age effect on contraceptive use rises from the youngest (15-24 years) to the middle (25-34) and peaks at the oldest (35-49) groups. The odds probabilities[6] of current contraceptive use are 0.465 to 1 among the youngest and 1.547 to 1 among the oldest groups. Therefore, odds probabilities of contraceptive use are three times higher among the older women than the younger women (Table 7.1). Compared to middle aged women they are 26 percent higher. Hence, the

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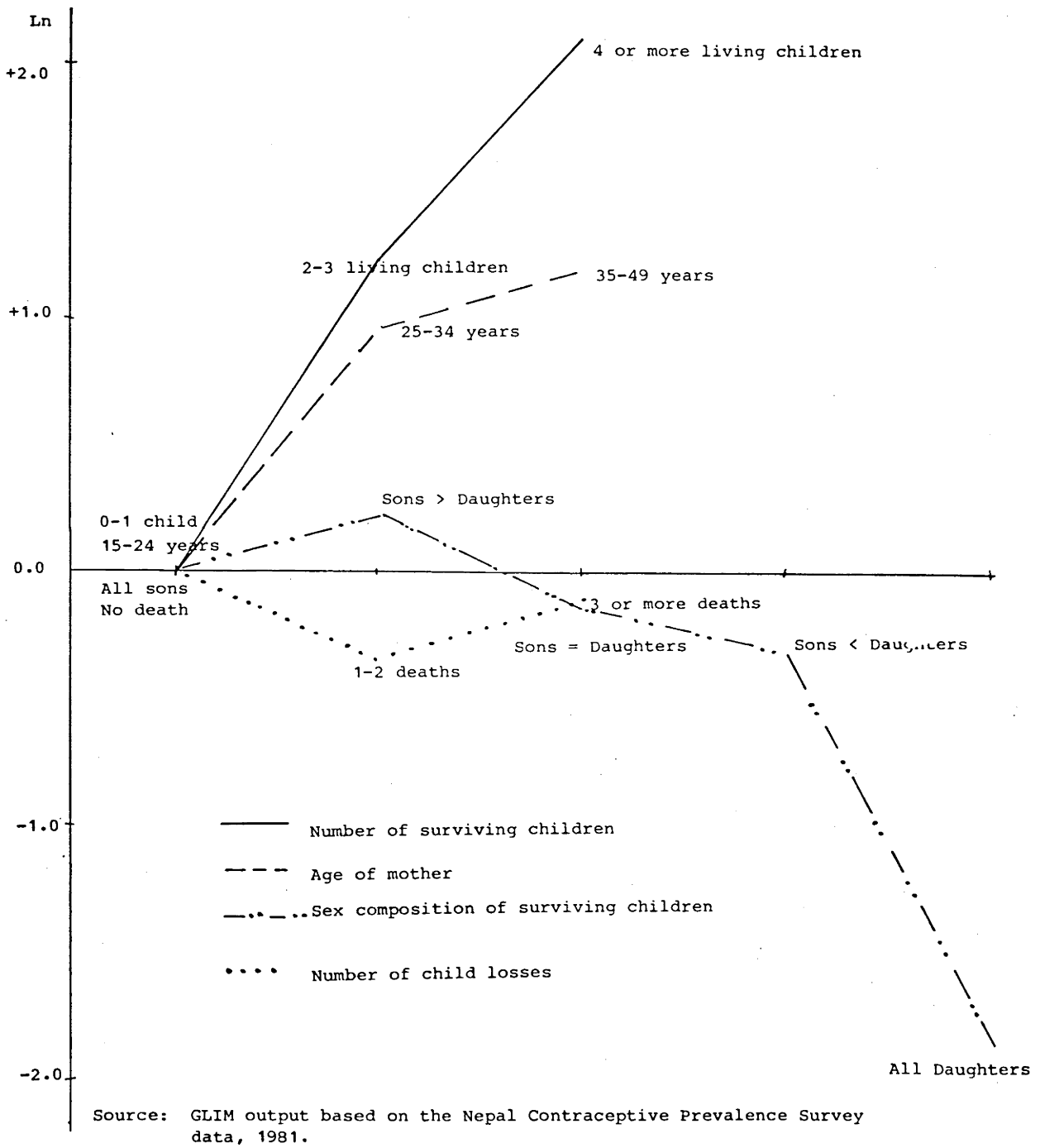
[6] The overall odds probability of current contraceptive users is 0.281 to 1.

FIGURE 7.1: ESTIMATES OF MAIN EFFECTS OF DEMOGRAPHIC FACTORS ON CURRENT CONTRACEPTIVE USE WITH SELECTED MODELS, 1981.



Source: GLIM output based on the Nepal Contraceptive Prevalence Survey data, 1981.

adjusted proportion presented in column 6 of Table 7.1 suggests that there are 11 percent of current contraceptive users among currently married women aged 15-24 who know an outlet, 25 percent among those aged 25-34, and 30 percent among 35-49 olds.

The effect of the number of living children is to gradually increase the current use of contraceptives as we move from no or one child to four or more children. The odds on being a contraceptive user are more than three times higher for women who have two to three living children and eight times higher for women with four or more living children, than for those who have only 0-1 child (second panel of Table 7.1). Hence, the difference in the adjusted proportion of current users is 34 percentage points between two groups, 0-1 child and four or more living children. Likewise, the difference in the proportion is 19 percent between women with two to three living children and women with four or more.

The prevalence of current contraceptive use also varies by the sex composition of the living children. The effect of the sex composition of living children rises from women who have only sons to those who have more sons than daughters; thereafter, it drops below zero for women who have an equal number of sons and daughters. The drop continues further for women who have fewer sons than daughters and those who have only daughters (Figure 7.1). However, it should be noted that variability is less if we exclude the 'all daughters' category. The odds probabilities of current contraceptive use are more than one, except for women who have fewer sons than daughters and those with daughters only. The odds of being contraceptive user are highest for women who have more sons than daughters followed by those

who have only sons, equal number of sons and daughters, fewer sons than daughters and only daughters. Thus, the highest proportion of current contraceptive users is found among those women who have more sons than daughters (32 percent) followed by those having all sons (27 percent), those having equal number of surviving children of both sexes (24 percent), those having fewer sons than daughters (21 percent) and those having only daughters (six percent). These findings clearly suggest that the sex composition of surviving children has a substantial effect on contraceptive use. The number of surviving sons is also one of the strongest determinants of contraceptive use in Nepal. While having daughters is considered important, it is still desirable to have more sons than daughters.

Though the effect of child losses is not statistically significant, it is worth mentioning that the proportion of current contraceptive users is slightly higher among those women who have not lost any children than among those who have lost one or more children.

The effects of all possible interactions were also investigated[7]. A significant interaction was observed between the number of living children and sex composition. The presence of this interaction indicates not only that these factors have direct effect on current contraceptive use, but also the effects are dependent upon each other.

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[7] Whenever an interaction term appears in a model, it is known as an interaction model. If there is no interaction term, it is known as an additive model.

7.3.2. DESIRE FOR NO MORE CHILDREN

In this section, we test the effect of the desire to stop childbearing on current contraceptive use. As we have noted earlier, for each individual variable- age, number of living children, educational level and work status, the proportion of exposed and fecund women wanting no more children increased. Therefore, it is relevant to test the hypothesis that the desire to have no more children has an effect on contraceptive use after controlling for the effects of age, number of living children, number of child losses, educational level and work status. The results are presented in Table 7.2 in several steps to delineate the effects of each group of controlling variables. The results clearly suggest that desire for no more children directly affects the level of current contraceptive use. The effect is significant no matter what set of variables is controlled for[8]. When the selected demographic and socio-economic variables are controlled, the odds-ratios indicate that the probability of being a current contraceptive user is about six times higher among those women who do not want more children than those who want more. Adjusted (controlled for the effects of age, number of surviving children, number of child losses, education and work status of woman and interaction) proportion of current contraceptive users based on the odds- ratios indicates that there is a difference of 30 percentage points between those who do not want more and those who do want more (last column of first panel of Table 7.2). When interactions are tested, it is found, as may be expected, that the

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[8] The overall scaled deviance, only with grand mean, is 486.8 with 323 degrees of freedom.

TABLE 7.2: LOGIT-LINEAR MODELS TO TEST THE EFFECTS OF DESIRE FOR NO MORE CHILDREN, HUSBAND-WIFE COMMUNICATION ON FAMILY SIZE MATTERS ON CURRENT CONTRACEPTIVE USE IN NEPAL, 1981.

Variable[1]	Number of women (1737)[5]	Gross Effects			Net Effects[2]			Net Effects[3]		
		X^2_{LR}	Odds-ratio	Unadjusted proportion	X^2_{LR}	Odds-ratio	Adjusted proportion	X^2_{LR}	Odds-ratio	Adjusted proportion
Desire for no more children		* 201.3			* 85.0			* 68.7		
Desire more	502		0.261	0.0938		0.335	0.1173		0.366	0.1268
Desire no more	783		2.367	0.4843		2.015	0.4442		1.907	0.4307
Husband-wife communication[4]		* 101.0			* 118.0			* 100.1		
Yes	507		2.480	0.4059		3.017	0.4539		2.820	0.4372
No	1213		0.684	0.1586		0.630	0.1479		0.648	0.1515

Notes:
[1] Desire for no more children and husband-wife communication each has one degree of freedom.
[2] Effect of desire for no more children is net of age, number of living children and number of child losses; and effect of husband-wife communication is net of age, number of living children and sex composition of living children and interaction.
[3] Effect of desire for no more children is net of age, number of living children, number of child losses, education, work-status and interaction; and effect of husband-wife communication is net of age, number of living children, sex composition of living children, education and work-status and interaction.
[4] When controlled for the effects of age, number of living children and education, X^2_{LR} =63.8 for husband-wife communication effects with one degree of freedom, p=<.001.
[5] Total may not add up to 1737 because of 'not reported' and 'don't know' cases in some variables.
* indicates chi-squared likelihood ratio is significant at 0.001 level.

Source: The Nepal Contraceptive Prevalence Survey, 1981.

interaction between number of living children and desire for no more children affects current contraceptive use significantly. The presence of the interaction in the model suggests that the effect of the desire for no more children also depends on how many children the woman has.

Assuming that the desire for no more children is affected by the sex composition of living children and also by the presence of inter-spouse communication on family size, we next test the validity of the 'zero' hypothesis, namely, that the desire for no more children is not related to contraceptive use when age, number of living children, sex composition of living children, education and inter-spouse communication on family size are controlled. The results indicate that the desire for no more children affects the level of current contraceptive use significantly, regardless of the sex composition of living children and whether or not there is inter-spouse communication on family size.

7.3.3 HUSBAND-WIFE COMMUNICATION ON FAMILY SIZE

The second panel of Table 7.2 presents results of the effect on current contraceptive use of inter-spouse communication on family size matters. The results indicate that husband-wife communication has a significant effect on current use, net of the effects of age, number of living children, sex composition of living children, educational level and work status. The effect is also net of the effects of interaction between number of living children and sex composition of living children. In fact, the contribution of inter-spouse communication in terms of chi-squared likelihood has increased

slightly, from 101.0 to 118.9[9]. This could be because of the cohort effect on inter-spouse communication, i.e. younger women are more likely to discuss family size with their husbands than older women. Similarly, uneducated and farm women are less likely to have inter-spouse communication than their educated and urban counterparts. Couples who discuss family size matters have net odds probabilities of current contraceptive use that are four times higher than couples who do not discuss them. The adjusted proportion of current contraceptive users reaches as high as 44 percent for women who have discussed family size matters with their spouses while it is only 15 percent for those who did not discuss them (last column of second panel of Table 7.2).

Table 7.3 presents the results of logit-linear models to test the effects of husband-wife communication on the use of temporary and permanent methods separately. An assumption is that this communication variable may have different effects on permanent methods compared to the use of a temporary method. Regular use of a temporary method might require somewhat more regular discussion between spouses. As to permanent methods, we have already pointed out that a decision to adopt female sterilization definitely needs husband's consent while a decision to adopt male sterilization is not necessarily made by both spouses. The first panel of Table 7.3 shows the effect of husband-wife communication on the use of temporary methods. The second panel of Table 7.3 shows the effect of husband-wife communication on the use of a permanent method. As the dependent

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[9] The overall scaled deviance is 648.7 with 431 degrees of freedom.

TABLE 7.3: LOGIT-LINEAR MODELS TO THE EFFECTS OF HUSBAND-WIFE COMMUNICATION ON FAMILY SIZE MATTERS, SEPARATELY, ON THE USE OF A TEMPORARY METHOD AND A PERMANENT METHOD IN NEPAL, 1981.

Husband-wife communication on family size[1]	Number of women	Gross Effects: X^2_{LR}	Gross Effects: Odds-ratio	Gross Effects: Unadjusted proportion	Net Effects[2]: X^2_{LR}	Net Effects[2]: Odds-ratio	Net Effects[2]: Adjusted proportion
Effects on use of temporary method[3]		* 38.0			* 32.3		
Yes	510		2.633	0.1273		2.520	0.1225
No	1222		0.668	0.0357		0.680	0.0363
Effects on use of permanent method[4]		* 75.0			* 69.5		
Yes	267		2.489	0.5454		2.573	0.5536
No	551		0.643	0.2365		0.633	0.2336

Notes: [1] Husband-wife communication variable has one degree of freedom.
[2] Model includes age, number of surviving children and education of women.
[3] Denominator is women who are exposed and know a family planning service outlet.
[4] Denominator is women who are exposed, wanting no more children and knew a family planning service outlet providing sterilization service.
* indicates chi-squared likelihood ratio is significant at 0.001 level.

Source: The Nepal Contraceptive Prevalence Survey, 1981.

variables are different in this analysis, denominators used are slightly different. For temporary methods, the group of exposed women who know a family planning service outlet is used. For permanent methods, the group of exposed women who want no more children and know a family planning service outlet providing a sterilization service is used. Gross and net effects on the use of temporary and permanent methods, treated separately, indicate that husband-wife communication on family size matters does have a significant effect on the dependent variables. Chi-squared likelihood ratios indicate that the effect of husband-wife communication on the use of a permanent method is more than on the use of a temporary method. For both types of methods, couples who discuss family size matters have net (adjusted for the effects of age, number of surviving children and education of woman) odds probabilities that are almost four times higher than couples who have not such communication. The adjusted proportion of use of a temporary method reaches 12 percent among couples who discuss family size matters but it is only four percent among couples who do not do so. Fifty-five percent of those[10] who discuss family size matters were using a permanent method, but only 23 percent of those who did not discuss family size matters were using such a method.

7.3.4 SOCIO-ECONOMIC EFFECTS ON CONTRACEPTIVE USE

Table 7.4 presents logit-linear models to test the effects of education and work status on current contraceptive use. As educated and non-farm women are mostly concentrated in urban areas, the effects are measured net of the effects of place of residence. The first

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[10] Exposed women who wanted no more children and knew an outlet providing a sterilization service.

TABLE 7.4: LOGIT-LINEAR MODELS TO TEST THE EFFECTS OF EDUCATION AND WORK-STATUS OF WOMEN ON CURRENT CONTRACEPTIVE USE IN NEPAL, 1981.

Variable[1]	Number of women (1737)[4]	Gross Effects			Net Effects[2]			Net Effects[3]		
		2 X_{LR}	Odds-ratio	Unadjusted proportion	2 X_{LR}	Odds-ratio	Adjusted proportion	2 X_{LR}	Odds-ratio	Adjusted proportion
Education		22.5*			21.8*			18.5*		
No schooling	1496		0.905	0.1996		0.873	0.1939		0.898	0.1983
Some schooling	241		1.862	0.3391		2.317	0.3896		1.953	0.3498
Work-status		53.7*			46.4*			28.0*		
Farming	739		0.603	0.1425		0.611	0.1441		0.669	0.1556
Non-farming	251		1.195	0.2477		1.114	0.2348		1.091	0.2311
No work	747		1.554	0.2998		1.570	0.3019		1.446	0.2849

Notes: [1] Education and work-status respectively have one and two degrees of freedom.
[2] Effects are net of age and number of living children.
[3] Effect of education is net of age, number of living children and place of residence, and effect of work-status is net of age, number of living children, place of residence and education.
[4] Total may not add up to 1737 because of 'not reported' and 'don't know' cases in some variables.
* indicates chi-squared likelihood ratio is significant at 0.001 level.

Source: The Nepal Contraceptive Prevalence Survey, 1981.

panel of Table 7.4 indicates that education has a statistically significant effect on current contraceptive use. Values of chi-squared likelihood ratios[11] suggest that the effect of education is little modified even when effects of age, number of living children and place of residence are taken into consideration. As expected, there is a positive relationship between education and current contraceptive use. Women with some formal schooling have odds probabilities of current contraceptive use more than twice those of women with no formal schooling: 0.898 to 1 among women with no formal schooling and 1.953 to 1 among women with some formal schooling. In terms of the proportion (adjusted for the effects of age, number of surviving children and place of residence) of current users, slightly more than one-third of the educated women are current contraceptive users as opposed to only one-fifth of the uneducated women.

The second panel of Table 7.4 presents the effect of work status on current contraceptive use. As with education, the probability of using contraception differs significantly with work status. When the effects of age and number of living children are controlled in the model, the chi-squared likelihood ratios relating to work status do not change much. The chi-squared value drops to almost half when education factor is included; but the drop is not enough to reject the hypothesis that work status has effect on current contraceptive use. Women who did not work had odds probabilities of current

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[11] The overall scaled deviance X^2_ν with grand mean in the model is 379.2 with 107 degrees of freedom.

contraceptive use that are more than double those of women working on farms. In addition, Nepalese women working in non-farm occupations have net odds probabilities of current use that are 63 percent higher than women working in farms (1.091/0.669=1.631). The adjusted proportions(adjusted for the effects of age, number of surviving children, place of residence and education of woman) indicate that there are 29 percent of current contraceptive users among women who do not work followed by 23 percent among women working in non-farm occupations and 16 percent among women working in farms.

7.3.5 PLACE OF RESIDENCE AND ACCESS TO A FAMILY PLANNING SERVICE OUTLET

As we saw earlier, distance from a family planning service outlet is related to the place of residence in Nepal. As there are more service outlets in the urban areas than in the rural areas, we shall examine the effect of place of residence on current contraceptive use before attempting to analyse the effect of accessibility on current use of contraception.

As expected, there is a significant relationship between the place of residence and contraceptive use (Table 7.5). Though the contribution of chi-squared value due to place of residence drops dramatically once education and work status are introduced, place of residence continues to be significantly related to current use. The odds ratios indicate that the probability of being a current user is 74 percent higher (1.636/0.940=1.74) among urban women than rural women (net of age, number of living children, education and work status).

TABLE 7.5: LOGIT-LINEAR MODELS TO TEST THE EFFECTS OF PLACE OF RESIDENCE AND ACCESS TO A FAMILY PLANNING SERVICE OUTLET ON CURRENT CONTRACEPTIVE USE IN NEPAL, 1981.

Variable[1]	Number of women (1737)[4]	Gross Effects			Net Effects[2]			Net Effects[3]		
		X^2_{LR}	Odds-ratio	Unadjusted proportion	X^2_{LR}	Odds-ratio	Adjusted proportion	X^2_{LR}	Odds-ratio	Adjusted proportion
Place of Residence		30.9*			29.1*			8.7**		
Rural	1539		0.902	0.1990		0.898	0.1983		0.940	0.2051
Urban	195		2.226	0.3801		2.332	0.3912		1.636	0.3107
Access to the Family Planning outlet		80.1*			72.9*			45.2*		
Less than one hour	495		2.164	0.3735		2.203	0.3777		2.025	0.3581
One-two hours	589		0.842	0.1883		0.832	0.1865		0.858	0.1912
Three hours or more	653		0.651	0.1521		0.649	0.1517		0.673	0.1564

Notes: [1] Place of residence and access to a family planning service outlet have respectively one and two degrees of freedom.
[2] Controlled for age and number of living children.
[3] Effect of place of residence is net of age, number of living children, education and work-status and effect of access to a family planning service outlet is net of age, number of living children and place of residence.
[4] Total may not add up to 1737 because of 'not reported' and 'don't know' cases in some variables.
* indicates chi-squared likelihood ratio is significant at 0.001 level.
** indicates chi-squared likelihood ratio is significant at 0.005 level.

Source: The Nepal Contraceptive Prevalence Survey, 1981.

Having found that there was a statistically significant relationship between place of residence and current contraceptive use, we tested the hypothesis that 'distance from an outlet' has no effect on current use after controlling for the effects of age, number of surviving children and place of residence. Results are presented in the second panel of Table 7.5. Gross and net effects (net of age and number of living children) of accessibility on current contraceptive use indicate that distance from an outlet has a statistically significant impact on the level of use. In the next step, in addition to age and number of living children, the effect of place of residence is controlled for. Although the chi-squared value dropped dramatically from 72.9 to 45.2 with the introduction of the place of residence variable, distance from an outlet continues to have a statistically significant impact on current contraceptive use. There is a clear inverse relationship between the distance from an outlet and current contraceptive use. The odds probabilities of current use are 2.025 to 1 among those who are less than one hour away from an outlet, 0.858 to 1 among those who are one to two hours away and 0.673 to 1 among those who are three hours or more away from an outlet. Thus, women living less than one hour away from an outlet have odds probabilities of current contraceptive use that are more than three times those for women living three hours or more away from an outlet; but the odds are only 27 percent higher among women who are one to two hours away than among those who live more than two hours away from an outlet. The proportion of current contraceptive users presented in Table 7.5 according to distance from an outlet indicates that it does not vary markedly whether the effects of other selected variables are controlled or not.

In order to be more definite about this result, an analysis was conducted separately for rural and urban women. This was essential, as 90 percent of urban women reside less than one hour from an outlet. Results of this analysis are presented in Table 7.6. The first panel of this table indicates that the distance of an outlet significantly affects the level of contraceptive use in rural Nepal.

Among the rural women, the odds probabilities of current contraceptive use are 2.172 to 1 for those living less than one hour, 0.919 to 1 for those living within one and two hours and 0.724 to 1 for those living three hours or more walking distance from an outlet. Hence, women residing less than one hour's distance have odds that are two times and three times higher than those residing one to two hours and three hours or more respectively. Again, it should be noted that the adjusted proportion of current users increases very little from the category, 'Three hours or more' to 'one to two hours' while it is substantial from 'one to two hours' to 'less than one hour'[12]. Therefore, to increase the level of contraceptive use in rural Nepal, family planning outlets should be located within less than one hour's walking distance from the residence of the potential users.

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[12] An increase is (((0.919/1+0.919)-(0.724/1+0.724))=0.06) between 'three hours or more' and 'one to two hours' and (((2.172/1+2.172)-(0.919/1+0.919))=0.21) between 'one to two hours' to 'less than one hour'.

TABLE 7.6: LOGIT-LINEAR MODELS TO TEST THE EFFECTS OF ACCESS TO A FAMILY PLANNING SERVICE OUTLET ON CURRENT CONTRACEPTIVE USE IN RURAL AND URBAN NEPAL, 1981.

Place of residence and access to an outlet	Number of women (1737)	Gross Effects			Net Effects[1]		
		X^2_{LR}	Odds-ratio	Unadjusted proportion	X^2_{LR}	Odds-ratio	Adjusted proportion
Rural	1539	47.2 *			41.3 *		
Less than one hour	321		2.167	0.3457		2.172	0.3462
One-two hours	573		0.925	0.1840		0.919	0.1830
Three hours or more	645		0.729	0.1509		0.724	0.1500
Urban	196	3.9 @			3.4 @		
Less than one hour	174		1.109	0.4139		1.120	0.4163
One-two hours	14		0.643	0.2905		0.552	0.2601
Three hours or more	8		0.230	0.1277		0.267	0.1453

Notes: [1] Model consists of age, number of surviving children and distance from an outlet.
* indicates chi-squared likelihood ratio is significant at 0.001 level.
@ indicates chi-squared likelihood ratio is not significant at 0.01 level.

Source: The Nepal Contraceptive Prevalence Survey, 1981.

The second panel of Table 7.6 shows that the distance from an outlet does not significantly affect the level of contraceptive use in urban Nepal. The monotonic decline in the odds ratios with an increase in the distance from an outlet in the urban areas could just have been by chance or random, as the number of women residing one hour or more away from an outlet is only 22; it can also be argued that the relationship is not significant because the majority of the observations fell in the first category ('less than one hour'). Thus, we regrouped this variable and fitted additional logit-linear models. Results are presented in Table 7.7. Gross and net (adjusted for the effects of age and number of surviving children) effects of access to a family planning outlet on current contraceptive use support the previous finding that the inverse relationship between accessibility and current contraceptive use is insignificant in the urban areas of Nepal. Nevertheless we believe that the relationship- the nearer a family planning service outlet the higher the proportion of current contraceptive use- cannot be ignored even in the urban areas. Almost 44 percent of the urban women are currently using a family planning method among those living within less than 15 minutes from an outlet while only 30 percent do so if they are living 30 minutes or more from an outlet, after controlling the effects of age and number of surviving children.

So far, all methods were included, when the effects of accessibility on current contraceptive use were tested. It can be argued that adoption of sterilization has no relation to access to a family planning outlet. Once the couple is determined to have sterilization, the distance from an outlet does not really matter. Two types of accessibility variables are used to test this argument.

TABLE 7.7: LOGIT-LINEAR MODEL TO TEST THE EFFECT OF ACCESS TO A FAMILY PLANNING SERVICE OUTLET ON CURRENT CONTRACEPTIVE USE IN URBAN NEPAL, 1981.

Access to a family planning outlet	Number of women (198)	Gross Effects			Net Effects[1]		
		2 X_{LR}	Odds-ratio	Unadjusted proportion	2 X_{LR}	Odds-ratio	Adjusted proportion
		@ 2.2			@ 2.1		
Less than 15 minutes	86		1.191	0.4311		1.227	0.4385
15-29 minutes	64		1.057	0.4023		1.024	0.3945
30 minutes or more	48		0.679	0.3017		0.672	0.2995

Notes: [1] Model includes age, and number of surviving children.
@ indicates chi-squared likelihood ratio is not significant at 0.050 level.

Source: The Nepal Contraceptive Prevalence Survey, 1981.

TABLE 7.8: LOGIT-LINEAR MODELS TO TEST THE EFFECTS OF ACCESS TO A FAMILY PLANNING SERVICE OUTLET ON USE OF A TEMPORARY AND PERMANENT METHOD AMONG EXPOSED WOMEN WANTING NO MORE CHILDREN IN RURAL NEPAL, 1981.

Access to a family planning outlet	Number of women	Gross Effects			Net Effects[1]		
		X^2_{LR}	Odds-ratio	Unadjusted proportion	X^2_{LR}	Odds-ratio	Adjusted proportion
Access to a temporary method[2]	231	2.99 **			2.28 **		
Home delivery	14		0.670	0.2078		0.619	0.1949
Less than one hour	84		1.364	0.3480		1.306	0.3382
One-two hours	78		0.789	0.2359		0.835	0.2464
Three hours or more	55		0.965	0.2740		0.970	0.2751
Access to a permanent method only[3]	641	21.3 *			17.3 *		
Less than one hour	130		2.013	0.5281		1.936	0.5183
One-two hours	254		0.970	0.3502		1.026	0.3632
Three hours or more	257		0.724	0.2869		0.698	0.2796

Notes: [1] Model includes age, and number of surviving children.
[2] Accessibility is defined as an access to any one of family planning temporary methods.
[3] Accessibility is defined a an access to any one of the permanent family planning methods.
* indicates chi-squared likelihood ratio is significant at 0.001 level.
** indicates chi-squared likelihood ratio is not significant at 0.05 level.

Source: The Nepal Contraceptive Prevalence Survey, 1981.

The first one is access to only a temporary method. The second one is access to only a permanent method. Table 7.8 presents the results of logit-linear models to test this hypothesis. Results indicate that distance from an outlet does affect significantly the use of a permanent method only. Net odds probabilities (adjusted for the effects of age and number of surviving children) of the use of a permanent method are almost three times higher when the women have access to an outlet providing a permanent method within less than one hour's distance compared to the women who have to walk three hours or more to reach an outlet providing a permanent method. The adjusted (net of the effects of age and number of surviving children) proportion of permanent method users reaches 52 percent among those residing within less than one hour's distance but only 28 percent among those residing three hours or more away.

CHAPTER 8

CONTRACEPTION AND FERTILITY

This chapter will assess the effect of the family planning programme on fertility in Nepal. Impact of the programme will be first measured in terms of changes in birth intervals over time, between 1976 and 1981. Birth interval analysis will then be extended to compare current users versus non-users in 1981. Subsequently, the impact of the family planning programme will be assessed from a different perspective, namely in terms of what the level of fertility would have been without such a programme in Nepal. To do this, two methodologies will be adopted: first, the component projection approach using a computerized model (CONVERSE) and family planning service statistics; second, a regression model developed by Bongaarts and Kirmeyer using contraceptive prevalence data from sample surveys; and finally, the age pattern of marital fertility will be compared with the standard natural fertility using the Coale-Trussel index to see the extent of fertility control existing in 1976 and 1981.

The analysis in this chapter begins by comparing the actual past fertility behaviour in terms of children ever born of current contraceptive users and non- users.

8.1 CHILDREN EVER BORN

It is a well established fact that family planning acceptors have higher fertility than non-acceptors (Freedman and Takeshita, 1969:280-291). One of the reasons for acceptors to adopt family planning is that they have too many children. As we have observed in

earlier chapters a large proportion of women are using contraception once they have four or more living children.

Higher fertility among family planning users than non-users in the Nepalese programme is obvious from Table 8.1 which presents the mean number of children ever born by age of a woman by current family planning status. Current users had 2.05 and 1.7 more live births than non-users according to the 1976 and 1981 surveys. This pattern persists when the mean number of children is shown for individual age groups. This relationship between fertility and current contraceptive status is observed in both 1981 and 1976.

Given the fact that the family planning programme has reached the couples who have higher fertility and are in need of controlling their family size, one may ask: how far has the family planning programme helped in reducing fertility? From Chapter four, we already know that marital fertility has not declined in Nepal. Therefore, the question arises: what has the family planning programme achieved in Nepal? Before we try to deal with this question, it is worth quoting a view of Freedman and Takeshita(1969:290):

> Without effective birth control, it is likely that they would continue to have much higher than average fertility for some years to come. Therefore, estimates of the potential effect of acceptances based on average age-specific fertility rates are probably in error, especially for older women.

TABLE 8.1: MEAN NUMBER OF CHILDREN EVER BORN BY AGE OF WOMAN BY CURRENT FAMILY PLANNING STATUS, 1976 AND 1981

Current status	Age of woman 15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total
1976								
Current users	1.00 (2)	2.62 (13)	3.84 (25)	5.58 (36)	5.74 (31)	6.53 (15)	6.00 (7)	5.05 (129)
Non-users	0.33 (646)	1.46 (1001)	2.93 (920)	4.16 (637)	5.17 (512)	5.90 (357)	6.12 (125)	3.00 (4198)
1981								
Current users	3.61 (1)	2.55 (39)	3.73 (77)	4.58 (113)	5.53 (70)	6.69 (64)	6.79 (35)	4.91 (399)
Non-users	0.40 (518)	1.56 (976)	2.76 (1050)	4.00 (789)	4.49 (634)	5.36 (533)	5.87 (373)	3.21 (4873)

Notes: Numbers in parentheses indicate number of women.

Sources: The Nepal Fertility Survey data, 1976 and The Nepal Contraceptive Prevalence Survey, 1981.

In the following sections, the effect of contraception on fertility will be estimated by using closed and open intervals and a number of techniques will be employed to estimate the number of births averted by the programme.

8.2 BIRTH INTERVALS

Data on birth intervals have been utilized to study the family building process in human populations. The importance of this approach is further enhanced as birth interval analysis permits an assessment of the effects of contraception, breastfeeding and infant mortality. There are two types of intervals: closed intervals and open intervals.

The closed interval is an interval between two consecutive live births. Though the closed interval has a number of advantages (Srinivasan, 1980:8-9), Srinivasan has warned that analysis of fertility dynamics based only on closed birth intervals may be misleading. He cited as example two countries, India and the United States of America, which have the same average length of intervals between successive births; but India has higher completed fertility and total fertility rate than the USA, because parity progression ratios in these two countries are entirely different. Hence, there are two aspects that need to be examined. The first one is the average interval required to have the next live birth. The second aspect is the proportion of women moving on to have the next live birth i.e., the parity progression ratio. Ryder (1980:16) referred to the former as the tempo of cohort fertility and to the latter as the quantum of cohort fertility. To study these two aspects, both closed

birth intervals and open intervals need to be combined.

The open interval is very simple in its concept. The length of the open interval is measured from the date of birth of the last child to the date of interview. The open interval has been used to examine the effect of family planning programmes in various countries. Bogue and Bogue (1980:103) indicated that a substantial proportion of women would have a long interval if there was an attempt made to attain a smaller family size. The open interval can also be used as a simple but sensitive index to measure changes in fertility in the recent past in the developing countries (Srinivasan, 1980:14). Another advantage of this index is that it is relatively reliable because it is less prone to recall lapse. One of its disadvantages is that length is affected by date of interview which is an arbitrary intrusion in the ongoing process of generating intervals between births. Thus open intervals are 'truncated'(Bogue and Bogue, 1980:103).

An analysis of birth interval data would be much simpler if pregnancy histories of women who had completed their reproductive period could be used. Unfortunately, data of this sort are not available from retrospective surveys except for women aged 45-49 who have completed their reproductive behaviours. Intervals available from retrospective surveys have, generally, two methodological biases aside from response errors[1]. It is unlikely that there will be serious response errors in the intervals which we intend to use for

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[1] The biases that need to be given attention are censoring and selectivity. Detailed disscussion of these two methodological problems is given, for instance, in Srinivasan (1980:10-11) and Rodriguez and Hobcraft (1980:14-15).

the present analysis- i.e. the last closed birth interval (interval between the last and last but one live births) and the open interval.

The use of life table techniques is generally recommended to overcome the censoring problem. Rodriguez and Hobcraft (1980:8) suggested construction of life tables for women reaching each parity at different ages to reduce the selectivity bias. Rindfuss and others (1982:5-16) have argued that the approach which Rodriguez and Hobcraft have taken produces a different type of bias with respect to age at the beginning of interval. Rindfuss and others explained in a lexis diagram that it was possible to control on age at the beginning of the interval(1982:9). For example, if we were to study intervals that began five years prior to the survey, we would construct life tables selecting women aged 15-44 (rather than women aged 15-49) for each parity.

Considering the above methodological problems, we constructed life tables using last closed and open birth intervals starting in 1970 or later from the NFS(1976) data, and intervals starting in 1975 or later from the CPS(1981) data for each parity. A control is introduced to select women who are between ages 15 and 44 years. Life tables produced from these two data sets (1976 and 1981) will allow us to observe changes in levels between 1976 and 1981. Results are summarized in Table 8.2.

The summary results suggest that there were changes in the quantum as well as tempo of fertility in Nepal between 1976 and 1981. Eighty eight percent of women did not have their second child for 18 months in 1976 while this percentage reaches 95 in 1981. Thirty six

TABLE 8.2: CUMULATIVE PROPORTION OF WOMEN WHO DID NOT HAVE THE GIVEN BIRTH AT SPECIFIC DURATION BY BIRTH ORDER: NEPAL, 1976 AND 1981.

Birth order and year	Number of women	Duration im months							Median interval
		9	12	18	24	30	36	42	
Second birth									
1976	542	0.994	0.965	0.881	0.718	0.562	0.406	(0.274)	33.22
1981	590	0.995	0.973	0.949	0.823	0.681	0.542	0.409	39.38
Third birth									
1976	514	0.998	0.972	0.880	0.711	0.526	0.386	(0.259)	32.47
1981	553	0.998	0.986	0.932	0.854	0.695	0.537	(0.373)	38.25
Fourth birth									
1976	416	0.992	0.962	0.874	0.718	0.536	0.361	(0.261)	32.40
1981	424	0.994	0.969	0.908	0.813	0.668	0.470	(0.374)	35.75
Fifth birth									
1976	330	0.991	0.959	0.880	0.731	0.579	0.394	(0.279)	34.14
1981	337	0.996	0.983	0.938	0.804	0.641	0.537	(0.448)	38.28

Notes: Figures inside parentheses indicate number of observation is less than 100 women.

Sources: 1976 data are based on the Nepal Fertility Survey, 1976 recode tape version.
1981 data are based on the Nepal Contracpetive Prevalence Survey, 1981.

months after the birth of the first child, 41 percent of women in 1976 did not have their second child as against 54 percent in 1981. The data clearly indicate that the differences increase with increasing duration at each parity. With regard to the tempo of fertility, half of the women who had their first child waited for 33 months to have the next child according to 1976 data, whereas half of those interviewed in 1981 waited for 39 months or more. Differences in the median intervals between 1976 and 1981 are slightly smaller at higher parities.

Changes in the quantum and tempo of fertility may not only be due to contraception but could also arise from breastfeeding and infant mortality patterns. Since our aim is to examine the effect of contraception on fertility, life tables were constructed by current family planning status from the CPS(1981) data. If the use of contraception had an effect on fertility, the proportion of women who did not have the next child at a specific duration would be larger among women who currently use contraception than among non-users. Life tables are produced irrespective of parity for the following reasons: (1) number of women becomes too small when classified by parity for users[2]; (2) analysis by birth order based on the last two children will generally result in gross under-representation of the more fertile women's experience as the last closed interval for each birth tends to be longer than the average closed interval(Rodriguez and Hobcraft, 1980:34). Rodriguez and Hobcraft suggest that this problem may be less acute when birth intervals are

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[2] When a sample size reaches near 100 or below 100, cumulative proportion of survivors can fluctuate substantially; therefore, 100 was suggested as a cut-off point for the life table analysis. (Smith, P.D., 1980:22).

analysed irrespective of parity; (3) cumulative proportions of women who did not have the next child at specific durations are not significantly different between parities in a given year[3].

TABLE 8.3: PROPORTION OF CURRENTLY MARRIED WOMEN AGED 15-44 NOT HAVING THEIR NEXT CHILD AT SPECIFIC DURATION BY CURRENT FAMILY PLANNING STATUS IN NEPAL, 1981

Duration in months	Current family planning status: Current users (N=231)	Current family planning status: Non-users (N=2774)
12	0.975	0.982
18	0.931	0.941
24	0.822	0.847
30	0.724	0.709
36	(0.604)	0.571
Median interval	42.16	40.41

Notes: Figures inside parentheses indicate number of observation less than 100 women.

Sources: The Nepal Contraceptive Prevalence Survey, 1981.

The summary result presented in Table 8.3 suggests that the proportions of current users who avoided having the next child at specific durations are not significantly different from those of non-users[4]. However, it may also be argued that the family planning

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[3] Approximate comparison of survival experience using Lee-Desu statistics are 0.898 with 3 degree of freedom, p-value =0.83 for 1976 and Lee-Desu statistics 1.638 with 3 degree of freedom, p-value=0.65 for 1981.

[4] Approximate comparison of survival experience using Lee-Desu statistic is 0.108 with 1 degree of freedom, p-value=0.74.

users would have had their next child much earlier than the non-users had they not used contraception. As W. Brass(1978:167) points out:

> For example, women aged, say 35 years enter a programme with, in general, a higher parity, greater fertility in the last five years and shorter interval to the last birth than the average for married women of same age in the population. Part of the difference is due to sterility (which will continue), part to risk exposure and fecunditity (which can change) and part due to chance (where the expected future excess is zero).

8.3 BIRTHS AVERTED

The purpose of this section is to ascertain what would have been the fertility level had there been no family planning programme in Nepal, and to estimate the number of births averted by the programme. A number of techniques are available to do this. Most of them have such common problems as, for instance, the concept of potential fertility; data requirement problems; interaction problems; uncontrolled variables; independence of methods; and cost-precision analysis (United Nations, 1978:6). A cost-precision analysis, generally, looks at the financial possibilities and evaluation objectives. Some of the important problems are discussed briefly below.

Potential fertility is a major component of six of the eight evaluation procedures[5]. An assessment of the impact of a family planning programme is carried out by comparing the actual fertility of

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[5] There are eight techniques available to assess the family planning programmes: (1) standardization approach; (2) standard couple-years of protection (SCYP); (3)component projection approach; (4) analysis of reproductive process; (5) multivariate areal analysis; (6) simulation approach; (7) experimental designs; and (8) projection and trend analysis. (United Nations, 1979:2)

the population under study and its potential fertility. As pointed out,

> 'Potential fertility' is the concept identifying this hypothetical fertility, which can be defined as the fertility a population subjected to a programme would have experienced in the absence of that programme. (United Nations, 1978:23).

Potential fertility is hypothetical in nature, therefore, incorrect estimation of potential fertility might result in over-estimation or under-estimation of the programme impact. The second expert group of the UN recommended use of a method that is adopted in the component projection approach. A programme CONVERSE (United Nations, 1982:10) calculates the natural fertility of fecund women i.e. potential fertility of users, as follows:

$$P_i = \frac{O_i}{(1-p_i) - s_i}$$

Where P_i = potential fertility of users of i age-group

O_i = observed fertility of i age-group

$1-p_i$ = proportion in non-users in i age-group

s_i = proportion of sterile women in i age-group

Most methodologies which estimate births averted by the programme need data on acceptors by individual family planning methods. Distribution of acceptors by and continuation rates for individual methods are then applied to estimate prevalence of contraceptive use at specific points in time.

If non-programme factors are operating to reduce fertility, it is of the utmost importance to estimate the net programme effects. Programme factors can influence fertility directly or indirectly through non-programme factors. Two ways were suggested to arrive at net programme effects. They are:

> One approach was to modify the potential fertility rate, that is, to multiply continuing acceptors at an appropriate point (or estimates thereof) by a measure of potential fertility which had been reduced to incorporate the possibility that some proportion of acceptors would have accepted privately, if the programme had not existed. Another approach was to modify the number of acceptors, that is, to modify the number of acceptors in the programme who might have adopted elsewhere and to use such data as the proportion of first-time acceptors who had used privately, or levels of use by education prior to the programme combined with changing educational distributions. Then, the net acceptors could be subjected to natural potential fertility. (United Nations,1982:11).

I will present the results based on three approaches: Component Projection Approach (CONVERSE), Regression Model, and the Coale-Trussel Index. Differences in the results may occur due to different technique as well as to quality of input data. It is essential to keep in mind the nature of the problem and quality of input data when discussing the results.

8.3.1 COMPONENT PROJECTION APPROACH

A computerized model(CONVERSE) which is described in the UN Manual IX (United Nations, 1979:48-62) is well suited in the Nepalese context because the Nepalese family planning programme has continued for more than a decade.

Nortman has pointed out that CONVERSE is an extension of the component approach which was first suggested by Lee and Isbister in 1966. CONVERSE is a one-sex and age component projection model. Thus, the model is only based on the characteristics of females. It is assumed that all acceptors are drawn from a pool of eligible married women aged 15-44 not currently using a method as of the mid-point of each programme year. Acceptors are aged over time by moving one-fifth of each age-group to the next higher age-group each year (1) to assign potential fertility rates for averting births in each programme year by current age of women, (2) to ensure that women who discontinue using a method are assigned to the correct age class of eligibles in the pool.

This method not only allows us to measure the effect of a ten-year programme but is also capable of handling a programme which provides more than one family planning method. In addition, as mentioned by Laing(1982:110), it is able to take into account the following important factors that other models do not:

(a) changes in the age structure of current users and non-users over time;

(b) the effects of age-specific levels of nuptiality, mortality, and sterility on fertility;

(c) changes over time in age-specific levels of nuptiality, mortality, and natural fertility;

(d) changes in the composition of acceptors with regard to method accepted; and

(e) the fertility effects of abortion.

However, as well as advantages, this approach has some limitations with respect to Nepal, owing to the unavailability of data by

age-group on proportions sterile or using a method for the first time, which therefore need to be estimated. Another more general methodological shortcoming in the CONVERSE model is that it does not take account of method failure and overlap of use of method during pregnancy. As a result, the number of births averted is overestimated. Therefore, Nortman suggested that it is highly desirable to use a conservative continuation method schedule while using the CONVERSE model. On the other hand, Laing(1982:111) pointed out that

> A shortcoming of CONVERSE (as with most other models that utilize data on contraceptive continuation) is the use of the modified negative exponential model to estimate and extrapolate continuation rates. Since this model tends to understate long-term use, it may cause fertility effects to be underestimated.

As with other techniques, the component projection approach needs data on continuation of use of each contraceptive method. Usually, these data are not accurate enough if based on surveys. CONVERSE produces a continuation schedule using the modified curve,

$$C = a\, e^{(-rt)}$$

where

> r is the rate at which the method is discontinued per unit of time, t; a is the proportion of the acceptors cohort that initiates use of the method (meaning that (1-a) accepts but does not use); e is the natural logarithm number 2.718....; and C is the resulting proportion of an acceptor cohort still using the method at the time t from acceptance (not to be confused with projection duration). (Nortman, 1979:56).

Nortman warned against overestimating the value of '$\underline{a}$' because the validity of the outputs depends heavily upon the validity of the values of '$\underline{a}$' and '$\underline{r}$'. Methods like oral pills and condoms are subject to wastage. Values of '$\underline{a}$' and '$\underline{r}$' are available for oral pills and Intra-uterine devices in Nepal from the follow-up survey of 1973-74[5] but there is no way of knowing the values for condom acceptors. Thus, I made a number of computer runs with values of 'a's ranging from 0.200 to 0.700 for condom in the application of the programme.

The definition of potential fertility is very clear in CONVERSE. It defines potential fertility of acceptors as equal to natural fertility of fecund women. The number of births averted in a given programme year is calculated as the product of potential fertility at current age of users and mean duration of contraception in the 12-month interval nine months prior to the programme year.

The CONVERSE model works in three steps. In the first step, it projects the female population under the assumption of no family planning programme. The second step, which is independent of the first one, calculates annual births averted by a family planning acceptor of a given age. The third step is similar to the first step, but in the projection of female population it deducts the number of births averted obtained in the second step.

The CONVERSE model produces a series of demographic and contraceptive use statistics that indicate the impact of the family planning programme. Tables 8.4 to 8.6 present the summary estimates of the impact of the Nepalese family planning programme derived from this model. The input data are shown in Appendix 8.1.

Table 8.4 shows the magnitude of the differences in selected demographic and contraceptive use variables if projection is based on the presence or absence of the family planning programme. The programme impact is shown for three different levels of 'a' for condom(low, a=0.2; medium, a=0.4; and high, a=0.7). The medium level ipact will be discussed here as it may provide the most reasonable estimate of effects on fertility.

The ten-year (1971-80) Nepalese family planning programme reduced the crude birth rate to 42.9 in 1981 compared to 45.4 without the family planning programme. The percentage decline of the crude birth rate due to the programme was 0.4 in 1972 and increased gradually in the subsequent years to 5.5 percent in 1981. The largest proportion of the decline can be attributed to women aged 30-34 whose births averted contribute almost one-third of the total births averted by the programme in 1981 (Table 8.6). Total female population after 10 years was 1.2 percent less than it would have been if there were no programme. The total fertility rate in 1981 was reduced by about 8 percent to 5.7. With regard to marital fertility, the programme was able to reduce the total fertility rate by 7.5 percent. The percentage decline was highest among older women (30 years or older). In 1981 the highest fertility group aged 25-29 experienced a marital fertility rate 6.2 percent lower than it would have been without the programme. In achieving these results, couple-years of use grew from a negligible level at the beginning of the programme to 5.2 percent of the married women of reproductive ages in year 10 (1980). During this year, 8.7 percent of the eligible women were recruited, with the heaviest recruitment(15.9 percent) among those aged 30-34. It should be noted that these acceptance rates are slightly higher in every

TABLE 8.4: DEMOGRAPHIC IMPACT OF A TEN-YEAR (1971-80) NEPAL FAMILY PLANNING PROGRAMME: SUMMARY RESULTS.

Item	Natural Fertility	Family Planning Programme Impact		
		Low	Medium	High
Year 11 (1981)				
Crude birth rate	45.4	43.3	42.9	42.4
Crude death rate	16.4	16.2	16.1	16.1
Crude natural increase	29.0	27.1	26.8	26.3
Population in year 11 (1981)				
Number (thousands of females)	7510.1	7435.7	7422.5	7402.7
Percentage reduced by programme	-	1.0	1.2	1.4
Total Fertility rate in year 11 (1981)	6.2	5.8	5.7	5.6
Age structure in year (1981) in %				
0-4	17.8	17.2	17.1	17.0
0-14	44.3	43.7	43.7	43.5
15-44	42.4	42.8	42.9	43.0
45+	13.3	13.5	13.4	13.5
Female children under 5 years per 1000 women aged 15-44: year 11 (1981)	420	402	399	394
Acceptors as % of eligible in year 10 (1980)				
15-44	2.1	8.6	8.7	8.8
15-19	0.4	1.7	1.7	1.7
20-24	1.8	7.0	7.1	7.1
25-29	2.6	10.5	10.6	10.7
30-34	3.7	15.7	15.9	16.2
35-39	2.8	11.8	12.0	12.2
40-44	1.7	6.6	6.6	6.7
Contraceptive use during year 10 (1980) as % of married women of reproductive age				
15-44	0	4.6	5.2	6.1
15-19	0	0.3	0.4	0.6
20-24	0	1.6	2.0	2.7
25-29	0	4.3	5.1	6.1
30-34	0	8.4	9.4	11.0
35-39	0	9.5	10.4	11.9
40-44	0	7.0	7.6	8.6
Percentage of reduction in marital age specific fertility rates year 11 (1981) and year 1 (1971)				
15-44	0	6.5	7.5	8.6
15-19	0	0.4	0.4	0.8
20-24	0	1.9	2.6	3.5
25-29	0	5.2	6.2	7.8
30-34	0	10.1	11.8	13.9
35-39	0	14.4	16.0	18.6
40-44	0	15.7	16.9	20.2

Notes: Low- uses proportion of condom acceptors not immediately discontinuing use as 0.200.
Medium-uses proportion of condom acceptors not immediately discontinuing use as 0.400.
High-uses proportion of condom acceptors not immediately discontinuing use as 0.700.

Source: CONVERSE Outputs.

TABLE 8.5: PERCENTAGE OF DECLINE IN CRUDE BIRTH RATE DUE TO NEPAL FAMILY PLANNING PROGRAMME BY PROGRAMME YEAR

		Family Planning programme impact								
		Low			Medium			High		
Programme year	Crude birth rate without programme	Births averted	Resulting crude birth rate	% of crude birth rate decline due to programme	Births averted	Resulting crude birth rate	% of crude birth rate decline due to programme	Births averted	Resulting crude birth rate	% of crude birth rate decline due to programme
1972	46.2	2522	46.0	0.4	2999	46.0	0.4	3714	45.9	0.7
1973	46.0	6395	45.5	1.1	7561	45.4	1.3	9309	45.3	1.5
1974	45.9	10060	45.2	1.5	11959	45.0	2.0	14808	44.8	2.4
1975	45.9	12764	45.0	2.0	15403	44.8	2.4	19363	44.5	3.1
1976	46.0	16846	44.8	2.6	20377	44.5	3.3	25673	44.2	3.9
1977	45.8	21036	44.5	2.8	24866	44.2	3.5	30611	43.8	4.4
1978	45.6	26592	43.9	3.7	31074	43.7	4.2	37798	43.2	5.3
1979	45.5	30973	43.6	4.2	36037	43.3	4.8	43634	42.9	5.7
1980	45.4	34445	43.5	4.2	40298	43.1	5.1	49077	42.6	6.2
1981	45.4	38838	43.3	4.6	45412	42.9	5.5	55273	42.4	6.6

Notes: Same as in Table 8.4

Sources: Same as in Table 8.4

TABLE 8.6: BIRTH AVERTED IN EACH PROGRAMME YEAR, 1972-81, NEPAL: MEDIUM IMPACT

	Programme year									
Age-group	1972	1973	1974	1975	1976	1977	1978	1979	1981	1982
15-19	73	169	245	300	382	414	488	529	582	644
20-24	504	1168	1713	2108	2715	3022	3603	3941	4312	4766
25-29	808	2007	3129	3945	5165	6224	7657	8672	9412	10414
30-34	923	2321	3704	4796	6422	7966	10058	11713	13141	14833
35-39	506	1376	2294	3081	4140	5245	6692	8029	9221	10572
40-44	185	520	873	1174	1553	1994	2577	3154	3630	4183
Total	2999	7561	11959	15403	20377	24866	31074	36037	40298	45412

Source: CONVERSE output.

individual age group except 40-44 years than we found in the CPS, 1981(Table 6.1). This small discrepancy might be due to the fact that they have different denominators.

8.3.2 REGRESSION MODEL

Most methodologies that are available to evaluate the impact of the family planning programme are based on the concept of 'acceptor'. Bongaarts and Kirmeyer (1982:381) identified a number of drawbacks in these methodologies. Firstly, they require a large volume of data which are often not available in the developing countries. Secondly, the definition of 'acceptor' is often hard to maintain because couples either discontinue use or switch methods frequently. Thirdly, the continuation rate is very difficult to obtain and so is the potential fertility of the acceptors. Fourthly, information collected for acceptors based on the family planning programme's service statistics is often unrepresentative of the country as more agencies are getting involved in distributing family planning methods. A large number of couples may be using commercial outlets to obtain contraceptives rather than those provided by the programme. Many agencies which distribute contraceptives do not provide adequate statistics to the national family planning programme for evaluation. All these points are relevant to the Nepal family planning programme because Nepal has poor service statistics and lacks adequate follow-up surveys.

The Bongaarts and Kirmeyer model (1982) is basically based on the regression equation derived by Nortman and Hofstatter (1980:94) who pooled data from 32 developing and 7 developed countries to explain

the relationship between fertility level and contraceptive prevalence. The resulting equation is

$$\text{Equation 1-} \quad Y = 46.9 - 42.0\ X$$

where Y is the crude birth rate and X is the percentage of married women of reproductive age using contraception.

The crude birth rate is seriously affected by the changing age structure of the population, the marriage pattern, the duration of breastfeeding and the incidence of induced abortion. Instead of using the crude birth rate as an index of fertility, Bongaarts and Kirmeyer used the total fertility rate which is free from the effect of the age structure of the population. They developed the following set of equations to remove the effects of the confounding variables:

$$\text{Equation 2-} \quad TFR = 7.30 - 6.42\ U$$
$$= 7.30 \times (1-0.879 \times U)$$

where TFR is the total fertility rate and U is the proportion of married women of reproductive age using contraception. Equation 2 yields an estimate which is unaffected by the changing age structure.

$$\text{Equation 3-} \quad TMFR = 9.54 - 4.81 \times U$$
$$= 9.54 \times (1-0.504 \times U)$$

where TMFR is total marital fertility rate adjusted for the effects of age-structure and the marriage pattern.

$$\text{Equation 4-} \quad TMFRA = 15.25 - 13.71 \times U$$
$$= 15.25 \times (1-0.899 \times U)$$

where TMFRA is total marital fertility rate adjusted for the effect of lactation. Bongaarts and Kirmeyer claimed that equation 4 yields an unbiased estimate of the fertility impact of contraceptive prevalence because the effects of age structure, marriage pattern, and duration of breastfeeding have been controlled[6].

Bongaarts and Kirmeyer suggest that the above procedures for analysing the relationship between aggregate measures of fertility and contraceptive prevalence can also be applied to age-specific fertility rates. Since our interest is to measure the change in the aggregate fertility level (total fertility rate), we concentrate on the aggregate model.

Equation 5 is suggested by Bongaarts and Kirmeyer(1982:396) to obtain an estimate of the change in fertility and contraceptive effectiveness in a situation where there is no change in marriage pattern and duration of breastfeeding.

$$\text{Equation 5-}\quad \frac{TFR2}{TFR1} = \frac{1-(e2xu2)/0.927}{1-(e1xu1)/0.927}$$

where subscripts 1 and 2 refer to 1976 and 1981 respectively and '$\underline{e}$' refers to contraceptive use-effectiveness level.

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[6] No control was made to remove the effects of other proximate determinants of fertility such as fecundability, spontaneous intra-uterine mortality, and the prevalence of permanent sterility because fertility is relatively insensitive to variations in these variables. (Bongaarts and Kirmeyer, 1982:387).

The information required to estimate change in fertility is contraceptive prevalence (U1 and U2) in years 1 and 2 and the contraceptive use-effectiveness levels in the same years (e1 and e2). U1 and U2 are obtained from the NFS(1976) and the CPS(1981) data, respectively. To obtain e1 and e2, the distributions of contraceptive methods in year 1 and year 2 are employed with suggested method-specific effectiveness levels. (See Appendix 8.2.)

Substituting values in equation 5, we get

$$TFR2/TFR1 = 0.95$$

The ratio between TFR2/TFR1 reveals that total fertility rate in 1981 should be 95 percent of the total fertility rate in 1976. Considering the fact that this ratio is not adjusted for the changes in breastfeeding and marriage patterns[7], the impact of contraception on fertility in Nepal may be even lower than five percent. But this five percent decline in total fertility rate between 1976 and 1981 seems consistent with the earlier finding based on the CONVERSE model.

8.3.3 COALE-TRUSSELL INDEX

The Coale-Trussell index is another technique to assess the effect of family planning on fertility. The basic assumption of this

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[7] In the previous chapter, we confirmed that there is no trend in marriage pattern in Nepal. With regard to duration of breastfeeding, adequate data are not available in Nepal to assess any potential change in breastfeeding pattern.

model according to Coale and Trussell(1974:187) is

> marital fertility either follows natural fertility (if deliberate birth control is not practiced), or departs from natural fertility in a way that increases with age according to a typical pattern. In a population in which fertility is voluntarily controlled, the ratio of marital fertility at each age, r(a), to a schedule of natural fertility, n(a), is given by
>
> $$r(a)/n(a) = M \exp (m. v(a))$$

where M is a scale factor expressing the ratio r(a)/n(a) at some arbitrarily chosen age and v(a) is an empirically derived function expressing the typical age pattern of voluntary control of fertility.

Coale and Trussell derived the values of n(a) and v(a) from empirical data. Values of n(a) were derived averaging ten schedules of natural fertility designated by Louis Henry (1961). Likewise, v(a)s were calculated using 43 marital fertility schedules of the early 1960s which are known to have typical patterns of departure, to varying degrees, from natural fertility.

The calculated value of 'm' using the marital fertility schedule of the population in question indicates the extent of departure from natural fertility. This index is independent of fertility level and depends entirely on the age-structure of fertility. A larger value of 'm' indicates a deviation of the marital fertility schedule in question from the standard natural fertility schedule. Thus, it implies that there is a greater amount of fertility control. A value of 'm' equal to one indicates that the fertility schedule differs from the standard natural fertility by the same average amount of deviation observed for the 43 marital fertility schedules in the early 1960s. Zero value of 'm' indicates that the marital fertility schedule is

TABLE 8.7: INDEX OF FERTILITY CONTROL (m) FOR INDIVIDUAL AGE GROUPS OF WOMEN: NEPAL, 1976 AND 1981.

Age-group	Values of 'm' 1976	1981
25-29	-0.3241	-0.0836
30-34	0.0095	0.2085
35-39	-0.0488	0.1124
40-44	0.1267	0.2119
45-49	-0.4416	-0.7260
Average	-0.1357	-0.0554

Sources: (1) 1976 Marital age-specific fertility rates are taken from Ministry of Health(1977), 'Nepal Fertility Survey, 1976: First Report', Table 5.7.

(2) 1981 Marital age-specific fertility rates are taken from Ministry of Health(1983), 'Nepal Contraceptive Prevalence Survey Report 1981', Table 5.1. Survey, 1981.

(3) n(a) values (schedules of natural fertility) are from Knodel (1977:223) following Coale and Trussel (1974:188) based on the arithmetical average of ten of the schedules designated by Henry (1961).

identical to the standard natural fertility schedule. A negative value of 'm' indicates that fertility declines even more slowly with age than in the standard natural fertility schedule.

Table 8.7 presents average values of the 'm's for individual age groups for 1976 and 1981. It is obvious that the extent of fertility control in Nepal is very limited. The negative values of 'm' suggest that fertility declines with age even more slowly than in the standard schedule of natural fertility. The comparison of 'm' values between

1976 and 1981 indicates that fertility control has been only slightly higher in 1981 than in 1976 in every individual age group except 45-49 years. Again, this finding is consistent with the increased prevalence rates found between 1976 and 1981. However, it is extremely important to be cautious while interpreting 'm' values by age because the model does not take into account differences in marriage duration(Page, 1977:85-106). Given the fact that there has been an increase in contraceptive use in Nepal, one can ask: what was its effect on marital fertility? J. Knodel (1977:224) points out that there are other factors besides deliberate family limitation which could affect the age pattern of departure from natural fertility as well as factors which might affect the age pattern of natural fertility itself:

> Marriage duration distributions and alternative spacing strategies were mentioned above as factors which could affect the characteristic age pattern of departure from natural fertility. Differences in length of the fecund period, perhaps related to nutrition, were mentioned as possibly influencing the shape of natural fertility, especially at the upper end of the reproductive span. Other factors include the frequency of intercourse, age differences between spouses and the extent of bridal pregnancy. For example, the relationship of coital frequency with age may differ widely from population to population and yet be independent of intention to control family size. Modal age differences between spouses also differ between populations and could affect the shape of fertility, since the age of the husband appears to exert an independent effect on marital fertility. Barbara A. Anderson,'Male Age and Fertility Results from Ireland Prior to 1911', POPULATION INDEX 41(1975), pp.561-567. Bridal pregnancy can influence the age structure of fertility by inflating the marital fertility rates at those ages where bridal pregnancy is most common. In addition, the extent and age pattern of primary and secondary sterility, particularly as a result of disease, may vary. (Knodel, 1977:224).

8.4 SUMMARY

It has been noted that cumulative fertility of family planning users is higher than that of non-users. A number of techniques has been used to assess the impact of the family planning programme in Nepal. The birth interval analysis suggests that average length of the last closed birth interval increased by 4-6 months between 1976 and 1981. But the average duration of the last closed birth interval was not significantly different by family planning status. Assuming that marriage and breastfeeding patterns remained unchanged between 1976 and 1981, the crude birth rate and total fertility rate would have been only five percent higher in 1981 had there been no family planning programme in Nepal. The Coale-Trussell index also shows that the impact of the family planning programme has been negligible but fertility control is slightly higher in 1981 than five years before.

CHAPTER 9

CONCLUSION

The wide variation in the various estimates of crude birth rates in Nepal in the 1950s - from 40 to 49 per thousand population (Tuladhar, et al., 1980:61) - indicates the degree of uncertainty about the true level of fertility. In the 1960s and 1970s, the crude birth rates were estimated by various experts applying different techniques not only to the census data but also to sample survey data. These estimates narrowed the range of the crude birth rates from 42 to 45 per thousand population during that period. For the 1970s and 1981 a more refined measure of fertility, the total fertility rate, could be calculated as more data from different sources became available. As shown in Table 9.1, estimates did not show any pronounced trend of total fertility rates between 1971 and 1981. The small differences can be attributed to different methods of data collection and techniques of estimation rather than to actual changes in levels. In our study we attempted to identify key reasons for the persistence of high fertility in Nepal.

Major conceptual frameworks relating to the study of fertility and its determinants were discussed in the second chapter, and a large number of variables which could affect the level of fertility were identified. The study of fertility determinants is very complex and numerous theories and models have been suggested by a great number of social scientists. In many instances, adequate data are lacking to test such theories or models. To proceed with this research, we proposed a framework which considers marriage and contraception as

TABLE 9.1: TOTAL FERTILITY RATES, 1971-1981.

Year	Sources	Total fertility rate
1971	Central Bureau of Statistics[1]	6.3
1975	United States Bureau of the Census[2]	6.4
1976	United States Bureau of the census[2]	6.4
1974-1975	Demographic Sample Survey[3]	6.3
1975-1976	Nepal Fertility Survey[4]	6.3
1976	Demographic Sample Survey[5]	6.0
1977-1978	Demographic Sample Survey[6]	6.2
1981	Nepal Contraceptive Prevalence Survey[7]	6.8

Sources: [1] Central Bureau of Statistics(1977), THE ANALYSIS OF THE POPULATION OF NEPAL, His Majesty's Government of Nepal, Kathmandu.

[2] Kramer, R.G.(1979), COUNTRY DEMOGRAPHIC PROFILES: NEPAL, United States Department of Commerce, Bureau of Census, Washington, D.C.

[3] Bourini, A.K.(1976), 'The Demographic Sample Survey of Nepal 1974-1975', report prepared for the Government of Nepal, Kathmandu.

[4] Goldman, N., A.J. Coale and M. Weinstein(1979),'The Quality of Data in the Nepal Fertility Survey', Scientific Report, no. 6, International Statistical Institute/World Fertility Survey, London.

[5] Bourini, A.K.(1977), 'The Demographic Sample Survey of Nepal, Second Year Survey 1976', report prepared for the Government of Nepal, Kathmandu.

[6] Central Bureau of Statistics(1978), 'The Demographic Sample Survey of Nepal, Third Year Survey, 1977-1978', His Majesty's Government of Nepal, Kathmandu.

[7] See appendix 4.1.

intermediate variables on the following grounds: (1) direct programmes (family planning and integrated health) to curtail Nepal's high fertility receive high priority in national development plans; (2) population policy supporting family planning activities has a long history in Nepal; and (3) family planning prevalence data are available from the national survey conducted in 1981. The proposed framework assumes that age at marriage is determined by demographic, socio-economic, cultural and environmental variables. The second intermediate variable, use of contraception, has, in our framework, three intervening variables: attitude toward family size, husband-wife communication on family size and knowledge of a family planning outlet. Other background variables were also considered as having an effect on the use of contraception, directly and indirectly, through the intervening variables. Our framework also considered the reduction of infant and child mortality through family planning and maternal and child health programmes as having an effect on the use of contraception both directly and indirectly.

A number of important findings of our study may explain sustained high fertility in Nepal:

(1) The mortality level, especially child and infant mortality, is still among the highest in the Asian countries.

(2) The majority of Nepalese ethnic groups have an extended or joint family system which encourages early marriage and a large family size. Nepalese society has a universal marriage system.

(3) Education is not very widespread in Nepal; in particular, the percentage of women attending school is very low.

(4) There is a lack of communication between spouses;

(5) It may be that the utility of children outweighs the

cost of rearing children in terms of child labour input and old-age security and there is also a strong preference for sons;

(6) Socio-economic measures that would curtail fertility levels indirectly have not been introduced until recently;

(7) Use of contraception is extremely low, and the probability of being a contraceptive user is extremely small if a woman has no surviving son;

(8) There is a large 'unmet need' for family planning. Approximately one-third of currently married women desire no more children but do not use contraception;

(9) There is a large differential in contraceptive use by husband-wife communication on family size, woman's education, work-status, place of residence and ethnicity;

(10) A large proportion of currently married women still do not know a family planning service outlet; and

(11) Access to an outlet is still very difficult for the majority of potential acceptors in Nepal.

As one would expect under these circumstances, impact of the family planning programme on fertility has been slight. Nepal is still at a very early stage of the demographic transition, and yet population growth is causing many problems. Studies done by Eckholm(1976), Macfarlane(1976) and Poffenberger(1980) examine the ecological problems facing Nepal as population continues to grow. Eckholm(1976:76) noted that Nepal's mountain environment was deteriorating rapdily and visibly. He went on to relate the situation to population growth:

> The facade of romance and beauty remains intact, but behind it are the makings of a great human tragedy. Population growth in the context of a traditional agrarian technology is forcing farmers onto ever steeper slopes, unfit for sustained farming even with the astonishingly elaborate terracing practiced there. Meanwhile, villagers must roam farther and farther from their homes to gather fodder and firewood, thus surrounding most villages with a widening circle of denuded hillsides. Ground-holding trees are disappearing fast among the geologically young, jagged

> foothills of the Himalayas, which are among the most easily erodable anywhere. Landslides that destroy lives, homes, and crops occur more and more frequently throughout the Nepalese hills.(1976:77).

In another study, Poffenberger(1980:49) argues that Nepal's population growth has affected man's relationship with the environment in two ways: the fragmentation of land into increasingly smaller segments and the growing demand on the forest for firewood or fodder. Poffenberger concluded:

> It was found that added population has put increasing pressures on the natural resources of the hills. This has resulted in a process of deforestation, loss of land through erosion, loss of moisture in the soil, and finally a loss of fertility in the soil. The loss of forest cover also means that there is less vegetable matter available for fodder, which in turn, results in less manure for fertilizer, leading to a decreasing productivity of the soil. As a result the traditionally well-balanced relationships existing between the people of the hills and their use of the environment have been disrupted, and it seems clear that until population pressures in the hills are relieved, the ability of the hills ecosystems to support human populations will continue to deteriorate.(1980:99).

Mortality, particularly infant and child mortality is expected to decline in the years to come, thus leading to even higher rates of population growth unless fertility declines. The problem of population growth is therefore a very serious one.

When age at marriage is controlled, women from the Mountains still continue to have lower fertility than those from the Hills and Plains except for those aged 15-34 years marrying at age 20 years or older. The mean number of children ever born does not differ between the Hills and Plains with the exception of women aged 35-49 years. Differential fertility by ethnicity indicates that Brahmin women have

lowest cumulative fertility at all ages at marriage with the exception of those marrying at ages 20 years or older among younger women (15-34). Among younger women (15-34), differentials in cumulative fertility by their religion, education and work-status almost disappear when age at marriage is controlled. Among older women (35-49 years), there is no consistent difference in fertility. The relationship between education of husbands and cumulative fertility is generally negative, suggesting that women with educated husbands have slightly lower fertility than those with less educated husbands regardless of age at marriage. With only a few exceptions there is no difference in fertility by the work-status of the husbands.

The effects of all these variables were also considered concurrently using multivariate analysis. The results reveal that five independent variables (geographical region, ethnicity, work-status of woman, education of husband and work-status of husband) explain only 1.4 percent of variation in fertility in Nepal. Even when age and age at marriage of women are added to the model as covariates, still only 12.5 percent of variation in fertility is explained.

Differentials in current fertility were also examined by selected background characteristics of the wife and her husband. The findings show no marked differentials in current fertility. It is possible that we might find differentials if we could measure other variables than those considered here. However, it is more likely that the lack of significant differentials indicates a 'pre-demographic transition' phase.

It is not unique to find such a lack of relationship between socioeconomic charateristics and fertility in a traditional society. Perhaps Nepal's population is not diverse enough in socio-economic status. Caldwell (1976:8) has found in his African study that there was no fertility differential by socioeconomic characteristics among the Yoruba of Nigeria. Though the Yoruba society was not a traditional society, in the sense that education was widespread and the region was more urbanized than Nepal, it was nevertheless a traditional society with regard to the family system. In a traditional society, a lack of contraceptive use is caused by or consistent with the combined forces of social setting, culture, the polity and the economy (Enstwisle, 1982:48). Generally, the family planning programme will benefit those of higher socioeconomic status, and this is consistent with our findings: the prevalence of contraceptive use in Nepal is higher among women aged 25-34 years, who have three or more living children or one or more living sons, who are educated, not working or working in non-farm occupations, and urban residents.

The models discussed above indicated that fertility level will be high and differentials limited in a society at Nepal's stage of development; these models or frameworks might be more useful only when Nepal enters the 'transitional' stage. The next question is: how and when will Nepal move to the 'transitional' stage? This question can probably be answered only when we collect more information about the changes in the Nepalese society which would provide a better idea about the aspects of social and economic conditions which may need to change if substantial fertility declines are to be achieved. This information should be generated by

conducting economic, social and socio-anthropological research on various aspects of Nepalese society including research on the value of children. Until we know more about these aspects of Nepalese society, it will be hard to give reasons for the persistence of high fertility in Nepal. Based on our present findings, there are, however, several factors that could be considered with respect to their possible policy implication.

Rapid population growth and development may be related in what appears to be a vicious circle. Does slowing of population growth have to wait for 'development' while 'development' is hindered by rapid population growth? On the one hand, if development takes place, modernization and improved living conditions which are part of it could be expected to bring down the birth rate. On the other hand, development may not be possible as long as the current high rates of population growth continue (UN, 1975:46). As we have observed earlier, Nepal, like many other developing countries, has tried to combat rapid population growth by introducing the family planning programme. Family planning programmes in general have been criticized for their inability to solve the problem of rapid population growth (Blake, 1965: 41-49 and Davis, 1967:730-739). On the other hand, a report of the Secretary-General of the United Nations presented in the World Population Conference in Bucharest, 1974 stated:

> Granted that the most favourable context for fertility decline is rapid and widespread development and modernization, there is, however, no reason to reject the common-sense assumption that family planning and educational programmes, as integral parts of development policies, may speed up the fall in fertility. Moreover, there are indications that fertility may even decrease in relatively early stages of social and economic development, which suggests that programmes designed to reduce fertility need not be postponed until late in the development

process.(United Nations, 1975:75).

Freedman and Berelson (1976:36) argue that there are several instances where fertility has declined without economic progress. One of the examples is the People's Republic of China. The well organized Indonesian family planning programme, particularly in Bali, has had a significant impact in reducing fertility levels under condition of slow development (Streatfield, 1982:445). Sri Lanka and Kerala, a state of India, are two other examples where fertility levels have fallen along with substantial mortality reduction and increase in education (Freedman and Berelson, 1976:36). Of course, these two are the signs of social change. Thus, it is clear that fertility decline is possible under varying conditions.

In Nepal, there is scope for a well organized family planning programme to reduce the current high population growth. As we have noted, current use of contraception among currently married and fecund women aged 15-49 was only about eight percent in 1981 (Chapter 6) and there was a large 'unmet need' for family planning services, comprising as much as 30 percent of the women at risk (see Table 6.8). This is a relatively large group compared to, for instance, Malaysia (23.2 percent) (Aziz, et al., 1982:366). If this level of 'unmet need' is applied to the estimated number of all currently married women under 45 as of 1980 (about 2.4 million), there are about 722,000 women in 'need' of family planning services. If all these women could be motivated to use family planning and all other things were equal, current use would jump to almost 40 percent, implying a crude birth rate of 31, according to the estimates of Nortman and Fisher(1982:22). To accomplish this level of contraceptive prevalence, the family

planning programme would need to expand not only its service outlets, but also its educational and motivational campaigns. This would probably necessitate a considerable improvement in the management and administration of the programme as well as substantial improvement in service delivery, i.e. effective follow-up system, training of personnel etc. Educational and motivational campaigns should emphasize spacing of births and encourage husband-wife communication on family size preferences. If all currently married women aged 15-49 had access to a family planning service outlet within a half- hour's distance, a well organized programme could expect as much as 55 percent of current users (see Table 6.27), provided that a majority of women desire no more children and are highly motivated to use contraception. This would imply a CBR of 25, and a remarkable change in Nepal's population prospects.

There is another side to the argument. The present family planning programme aims to serve only women who do not want any more children. If mortality continues to decline, which is likely to happen, and unwanted births are proportionately reduced, the population growth will continue to be high as the result of the continuation of high family size desires. On average, a Nepalese married woman desired to have 4.2 children in 1976 and 3.9 children in 1981[2]. The decline in the desired family size could be due to a

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[2] Mean number of desired children is estimated by adding the number of living children and the number of additional children wanted at the time of the survey. The use of desired family size and ideal family size has been questioned by many demographers and it continues to be a controversial issue regarding both meaning and validity of the concepts(Freedman, et al., 1955; Hauser, 1967; Ryder and Westoff, 1971; Ware, 1973 and 1974; Knodel and Prachuabmoh, 1973, Freedman, et al., 1975; and Caldwell, 1976).

number of reasons which include a decline in mortality level, though the decline, whatever its causes, is only marginal and the four-child preference is still too high compared to developed and some developing countries. It is still far above the level required to reach replacement level fertility. Blake argues that family planning has a slim chance of overcoming the problem of desire for large families (Blake,1965:45) and that modernization alone has nowhere in the world to date had an abiding and drastically downward effect on family size desire (ibid., p. 59). She suggests that the employment of women outside the home constitutes one of the most likely sources of a desire for smaller families. Such employment will often provide alternative satisfactions to children (companionship, recreation, stimulation, and creative activity), or the means to such satisfactions in the form of financial remuneration (ibid., p. 62). As we have observed before, efforts to create an environment for Nepalese women to work outside the home have been initiated. Such efforts should be given a high priority in development plans and the programme should be more vigorous than now if it is to have a substantial effect on fertility.

Another policy that may have considerable effect on fertility is raising the age at marriage. As we have noted earlier, any differences in fertility that were found in Nepal disappeared once age and age at marriage were controlled for. It is probably high time to consider legislating for a higher minimum age at marriage. According to Tuladhar and Stoeckel (1976:60), an increase in age at marriage to 20 and 25 years for females could lead to a 7 and 15 percent decline, respectively, in the CBR in Nepal in five years. Another advantage of raising age at marriage is that individuals who have not married by

the time they are in their late twenties often do not marry at all (Davis, 1967:737). This would further help in reducing fertility. Legislation is of no practical use if it is not accepted by the society and adequately enforced. It is difficult to enforce, late marriage however, if there is no alternative to marriage offered to young women - such as gainful employment.

In conclusion, because Nepal is at the very beginning of demographic transition, the problems resulting from rapid population growth require that strong efforts be made to lower fertility. A strong family planning programme is definitely needed, but other supporting programmes are necessary as well.

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APPENDIX 4.1

ESTIMATION OF AGE-SPECIFIC FERTILITY RATES

Age-specific fertility rates are calculated using data based on (1) births in the year prior to the 1981 survey, and (2) children ever born. The description in the UN Manual IV of the method of estimating total fertility rates assumes the following conditions (page 33):

(1) Fertility at ages 15-29 has been constant in the recent past;

(2) The age pattern of fertility conforms to the typical age relationships found in population practicing little birth control, implying (a) that the age pattern of declining fecundability is typical; and (b) that widowhood, divorce, and other forms of dissolution of sexual unions do not have an unusual age incidence from age thirty to forty-five in the population in question.

Estimation of Age-specific Fertility Rates(ASFR) and Total Fertility Rate (TFR) :

Exact age of woman at time of survey	Average number of births in the preceding year per woman	Average number of children ever born	Cumulative fertility at beginning of interval	Multiplying factors for estimating average value fertility	Estimated average cumulative fertility		Adjusted Age-specific fertility rates
(i)	(f_i)	(P_i)	($\sum_{j=n}^{i-1} f_j$)	(w_i)	($F_i = \sum_{j=n}^{i-1} f_j + w_i f_i$)	(P_i / F_i)	($f_i' = f_i \times P_x / F_x$)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
15-19	0.1087	0.7938	0	2.2152	0.2408	(1.000)	0.1395
20-24	0.2545	1.6376	0.544	2.8775	1.2758	1.2836	0.3267
25-29	0.2516	2.7936	1.816	3.0287	2.5780	1.0836	0.3230
30-34	0.1934	3.9228	3.074	3.1349	3.6803	1.0659	0.2483
35-39	0.1563	4.5495	4.041	3.2749	4.5529	0.9993	0.2006
40-44	0.0648	4.9146	5.147	3.5847	5.3788	0.9137	0.0832
45-49	0.0378	5.5589	5.336	4.5780	5.5086	1.0091	0.0485

TFR= $5\sum f_i' = 5 \times 1.3698 = 6.849$

Notes: Column 2- (a) number of ever married women is calculated multiplying number of currently married women in 1981 by ratio of number of married women to number of currently married women based on 1976 NFS.
(b) average number of births per woman in the preceding year prior to the survey is calculated dividing the estimated number of births in the past year by the estimated number of ever married women.

Column 3- average number of children ever born is derived dividing total number of children ever born by the estimated total number of women.

Column 4- $\sum_{j=0}^{i-1} f_j$ i.e. $5(f_1+f_2)$ $=(0.1087+0.2545)5=1.816$

Column 5- w_i (multiplying factors) estimated by interpolation in annex table IV of UN Manual IV.

Column 6- F_i (estimated average cumulative fertility)= $\sum_{j=0}^{i-1} f_j+(w_i f_i)$

i.e. F_i $=1.816+(3.0287 \times 0.2516)=2.5780$

Column 7- P_i/F_i, i.e. $P_3/F_3=2.7936/2.5780=1.0836$

Column 8- f_i' (adjusted Age-specific fertility rate)= $f_i \times P_2/F_2$

APPENDIX 4.2

NEPAL FERTILITY SURVEY, 1976: QUESTIONS ON MARRIAGE

19.

SECTION 4: MARRIAGE HISTORY

[5] [| |] 1 2 4

401. Now I have some questions about your married life. In what month and year did you get married?

_______ , _______
(MONTH) (YEAR)
(SKIP TO 403)

D.K. [88]

[|] 5 [|] 7

[|] 9 [|] 11

402. PROBE: How many years ago did you get married?

____
(YEARS)

[|] 13

403. Did you and your husband start living together immediately after the marriage?

YES [1]
(SKIP TO 405)

NO [2]

[ ] 15

404. Then how long after the marriage did you and your husband start living together?

____
(MONTHS AND YEARS)

[|] 16

405. INTERVIEWER: TICK APPROPRIATE BOX (SEE COL.8 OF HOUSEHOLD SCHEDULE)

MARRIED [1]

WIDOWED [2]
(SKIP TO 409)

SEPARATED OR DIVORCED [3]
(SKIP TO 408)

[ ] 18

406. Does your husband ordinarily live in your household?

YES [1]
(SKIP TO 410)

NO [2]

[ ] 19

407. Is he away only for the time being, or have you stopped living together for good?

AWAY FOR TIME BEING [1]
(SKIP TO 410)

STOPPED FOR GOOD [2]

[ ] 20

408. In what month and year did you stop living together?

_______ , _______
(MONTH) (YEAR)
(SKIP TO 428)

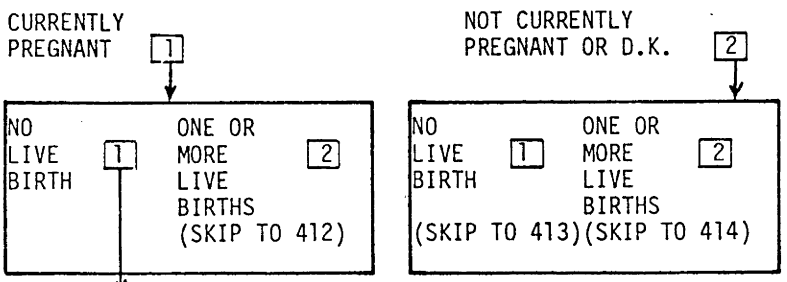
[|] 21 [|] 23

409. In what month and year did your husband die?

[|] 25 [|] 27

20.

410. INTERVIEWER: TICK APPROPRIATE BOX (See 211, 212)



29 ☐

30 ☐

411. Now, thinking back over your married life before you became pregnant, were there any times when you and your husband had to live apart for a month or more? For example, when he worked away from home or when one of you was in the hospital, or when you were visiting your parents?

YES 1 (SKIP TO 415) NO 2 (SKIP TO 428) ☐ 31

412. Thinking back over the interval between your (last) live birth and your current pregnancy, were there any times when you and your husband had to live apart for a month or more? For example when he worked away from home, when one of you was in the hospital or when you were visiting your parents?

YES 1 (SKIP TO 415) NO 2 (SKIP TO 428) ☐ 32

413. Thinking over your marriage, were there any times when you and your husband had to live apart for a month or more? For example, when he worked away from home, when one of you was in the hospital, or when you were visiting your parents?

YES 1 (SKIP TO 415) NO 2 (SKIP TO 428) ☐ 33

414. Since the time of your (last) child's birth, were there any times when you and your husband had to live apart for a month or more? For example, when he worked away from home, or when one of you was in the hospital, or when you were visiting your parents?

YES 1 NO 2 (SKIP TO 420) ☐ 34

415. During this period, when were you temporarily apart for the first time for one month or more?

_____, _____
(MONTH) (YEAR)

☐☐ 35 ☐☐ 37

APPENDIX 4.3

CUMULATIVE PROPORTION OF WOMEN EVER MARRIED, AT SINGLE YEAR AGES BETWEEN 11.0 AND 40.0 AND AT 45; BY AGE GROUP: NEPAL, 1976.

	Cumulative proportion ever married- ages							
Age	15-19	20-24	25-29	30-34	35-39	40-44	45-49	15-49
11.0	.037	.072	.097	.102	.070	.100	.111	.079
12.0	.085	.122	.159	.169	.113	.168	.136	.133
13.0	.142	.205	.251	.245	.194	.237	.199	.208
14.0	.212	.308	.349	.368	.302	.319	.286	.303
15.0	.307	.409	.473	.497	.434	.420	.413	.416
16.0	.422	.520	.583	.602	.541	.545	.527	.529
17.0	.518	.638	.656	.685	.629	.636	.635	.625
18.0	.626	.739	.733	.760	.707	.710	.723	.713
19.0	.689	.802	.801	.814	.770	.757	.759	.774
20.0		.859	.852	.862	.822	.826	.812	.833
21.0		.899	.893	.895	.866	.861	.858	.875
22.0		.931	.919	.929	.898	.906	.884	.907
23.0		.952	.939	.948	.916	.926	.908	.930
24.0		.962	.949	.960	.933	.936	.926	.943
25.0			.958	.968	.948	.943	.942	.953
26.0			.967	.974	.953	.950	.948	.960
27.0			.979	.980	.962	.957	.958	.969
28.0			.987	.988	.972	.961	.969	.976
29.0			.987	.988	.979	.970	.970	.980
30.0				.989	.983	.977	.972	.983
31.0				.989	.984	.981	.975	.985
32.0				.989	.986	.981	.979	.986
33.0				.989	.988	.984	.981	.988
34.0					.989	.986	.981	.989
35.0					.991	.986	.983	.989
36.0					.992	.986	.986	.991
37.0					.992	.986	.986	.991
38.0					.992	.989	.986	.992
39.0					.992	.990	.986	.993
40.0					.992	.990	.986	.993
45.0							.990	.994

Note: Rates are for most recent marriage, not first marriage.

Source: Smith, D. P.(1980), 'Age at marriage', Comparative Studies, Cross National Summaries, No. 7 (April), International Statistical Institute/World Fertility Survey, London, Table A1.

APPENDIX 4.4

RESULTS OF ANALYSIS OF VARIANCE: TEST OF SIGNIFICANCE ON CUMULATIVE FERTILITY OF CURRENTLY MARRIED WOMEN AGED 15-34: NEPAL, 1976

Main effects	Sum of squares	Degrees of freedom	Mean square	F-value	Significance of F-value
1. Geographical region	31.369	2	15.684	8.879	0.000
2. Ethnicity	2.074	1	2.074	1.175	0.278
3. Religion	6.774	1	6.774	3.834	0.050
4. Education of woman	7.495	1	7.495	4.249	0.039
5. Work status of woman	3.228	1	3.228	1.827	0.177
6. Education of husband	3.228	1	3.228	1.827	0.177
7. Work status of husband	0.011	1	0.011	0.006	0.938

Notes: All of the independent variables were introduced separately with age and age at marriage.

Source: The Nepal Fertility Survey(1976), standard recode, version 1, London: ISI/WFS.

APPENDIX 4.5

RESULTS OF ANALYSIS OF VARIANCE: TEST OF SIGNIFICANCE ON CUMULATIVE FERTILITY OF CURRENTLY MARRIED WOMEN AGED 35-49: NEPAL, 1976

Main effects	Sum of squares	Degrees of freedom	Mean square	F-value	Significance of F-value
1. Geographical region	59.054	2	29.527	4.462	0.012
2. Ethnicity	36.605	1	36.605	5.519	0.019
3. Religion	12.512	1	12.512	1.883	0.170
4. Education of woman[1]					
5. Work status of woman	75.719	1	75.719	27.438	0.001
6. Education of husband	42.899	1	42.899	6.475	0.011
7. Work status of husband	46.962	1	46.962	7.137	0.008

Notes: [1] Too few women in one category, therefore, this variable was dropped from the analysis.
All of the independent variables were introduced separately with age and age at marriage.

Source: The Nepal Fertility Survey(1976), standard recode, version 1, London: ISI/WFS.

APPENDIX 4.6A

RESULTS OF ANALYSIS OF VARIANCE: TEST OF SIGNIFICANCE ON CUMULATIVE FERTILITY OF CURRENTLY MARRIED WOMEN AGED 35-49, 1976 WITH AGE OF WOMAN AND AGE AT FIRST MARRIAGE AS COVARIATES

Source of variation	Sum of Squares	Degrees of freedom	Mean Square	F-value	Significance of F
Main effects	112.854	6	18.809	2.989	0.007
V63 Geographical region	30.872	2	15.436	2.453	0.086
V69 Ethnicity	9.519	1	9.519	1.513	0.219
V70 Work status of woman	2.332	1	2.332	0.370	0.543
V77 Education of husband	34.553	1	34.553	5.491	0.019
V79 Work status of husband	29.107	1	29.107	4.625	0.032
Covariates	1322.845	2	661.422	105.104	0.000
V4 Age of woman	348.906	1	348.906	55.443	0.000
V8 Age at first marriage	1026.122	1	1026.122	163.057	0.000
2-way interactions	205.947	14	14.710	2.338	0.003
V63 V69	63.816	2	31.908	5.070	0.006
V63 V70	4.905	2	2.453	0.390	0.677
V63 V77	2.019	2	1.009	0.160	0.852
V63 V79	31.579	2	15.789	2.509	0.082
V69 V70	35.265	1	35.265	5.604	0.018
V69 V77	27.437	1	27.437	4.360	0.037
V69 V79	9.382	1	9.382	1.491	0.222
V70 V77	18.151	1	18.151	2.884	0.090
V70 V79	19.840	1	19.840	3.153	0.076
V77 V79	1.749	1	1.749	0.278	0.598
3-way interactions	90.992	16	5.687	0.904	0.565
V63 V69 V70	9.107	2	4.553	0.724	0.485
V63 V69 V77	3.118	2	1.559	0.248	0.781
V63 V69 V79	14.227	2	7.114	1.130	0.323
V63 V70 V77	9.456	2	4.728	0.751	0.472
V63 V70 V79	0.106	2	0.053	0.008	0.992
V63 V77 V79	4.926	2	2.463	0.391	0.676
V69 V70 V77	32.670	1	32.670	5.192	0.023
V69 V70 V79	41.827	1	41.827	6.647	0.010
V69 V77 V79	10.832	1	10.832	1.721	0.190
V70 V77 V79	3.553	1	3.553	0.565	0.453
Explained	1732.637	38	45.596	7.245	0.000
Residual	9684.971	1539	6.293		
Total	11417.609	1577	7.240		

Notes: Covariate Raw regression coefficient
V4 0.113
V8 -0.197
1647 Cases were processed.

Source: The Nepal Fertility Survey(1976), standard recode, version 1, London: ISI/WFS.

APPENDIX 4.6B

RESULTS OF ANALYSIS OF VARIANCE: TEST OF SIGNIFICANCE ON CUMULATIVE FERTILITY OF CURRENTLY MARRIED WOMEN AGED 35-49, 1976 WITH AGE OF WOMAN, SQUARED AGE OF WOMAN, AGE AT FIRST MARRIAGE AND SQUARED AGE AT FIRST MARRIAGE AS COVARIATES

Source of variation	Sum of Squares	Degrees of freedom	Mean Square	F-value	Significance of F
Main effects	112.854	6	18.809	2.998	0.006
V63 Geographical region	30.872	2	15.436	2.460	0.086
V69 Ethnicity	9.519	1	9.519	1.517	0.218
V70 Work status of women	2.332	1	2.332	0.372	0.542
V77 Education of husband	34.553	1	34.553	5.507	0.019
V79 Work status of husband	29.107	1	29.107	4.639	0.031
Covariates	1363.221	4	340.805	54.320	0.000
V4 Age of woman	31.316	1	31.316	4.991	0.026
V8 Age at first marriage	110.018	1	110.018	17.535	0.000
SV4 Squared age of woman	21.899	1	21.899	3.490	0.062
SV8 Squared age at first marriage	19.054	1	19.054	3.037	0.082
2-way interactions	210.024	14	15.002	2.391	0.003
V63 V69	63.311	2	31.656	5.045	0.007
V63 V70	4.798	2	2.399	0.382	0.682
V63 V77	1.987	2	0.994	0.158	0.854
V63 V79	35.479	2	17.740	2.827	0.059
V69 V70	36.184	1	36.184	5.767	0.016
V69 V77	27.989	1	27.989	4.461	0.035
V69 V79	9.513	1	9.513	1.516	0.218
V70 V77	15.625	1	15.625	2.490	0.115
V70 V79	19.494	1	19.494	3.107	0.078
V77 V79	2.088	1	2.088	0.333	0.564
3-way interactions	88.329	16	5.521	0.880	0.593
V63 V69 V70	7.729	2	3.864	0.616	0.540
V63 V69 V77	2.821	2	1.411	0.225	0.799
V63 V69 V79	15.402	2	7.701	1.227	0.293
V63 V70 V77	8.162	2	4.081	0.650	0.522
V63 V70 V79	0.087	2	0.044	0.007	0.993
V63 V77 V79	5.066	2	2.533	0.404	0.668
V69 V70 V77	31.473	1	31.473	5.016	0.025
V69 V70 V79	40.858	1	40.858	6.512	0.011
V69 V77 V79	12.669	1	12.669	2.019	0.156
V70 V77 V79	3.253	1	3.253	0.519	0.472
Explained	1774.428	40	44.361	7.071	0.000
Residual	9643.181	1537	6.274		
Total	11417.609	1577	7.240		

Notes: Covariate — Raw regression coefficient

Covariate	Raw regression coefficient
V4	0.686
V8	-0.332
SV4	-0.007
SV8	0.003

1647 cases were processed

Source: The Nepal Fertility Survey(1976), standard recode, version 1, London: ISI/WFS.

APPENDIX 4.7

IDENTIFICATION OF INTERACTION

To identify the cause of interaction between geographical region and ethnicity, the following deviations[1] from the grand means were obtained from the MCA using a new composite variable with other factors and covariates taken into consideration:

Geographical region	Ethnicity		
	Mongoloids	Others	Total
Mountains	- 0.31	- 0.45	- 0.41
Hills	0.04	0.14	0.06
Plains	1.28	- 0.13	- 0.01
Total	0.10	- 0.04	

Ordinarily, we would have obtained the following deviations if there were no interaction:

Geographical region	Ethnicity	
	Mongoloids	Others
Mountains	0.10+(-0.41)=-0.31	- 0.45
Hills	0.16	0.02
Plains	0.09	- 0.05

[1] Deviations for totals were obtained before making new composite variable; deviations for each cell (sub-group) are obtained with new composite variable. All deviations are adjusted for all other independent variables and covariates. This method was suggested by Professor Thomas Pullum, University of Washington (personal communication).

Now, differences between these two deviations (interactive model versus additive model) would show where there is a real problem. Deviation from the deviations would give us:

Geographical region	Ethnicity	
	Mongoloids	Others
Mountains	- 0.31- (-0.31)=0.00	0.00
Hills	- 0.12	0.12
Plains	1.19	-0.08

Differences observed between the two models guide us to the exact position of the interaction problem. Most of the deviations are within the normal range except the Plains-Mongoloids group who have unexpectedly high cumulative fertility. There are 42 women of this type.

APPENDIX 4.8

COMPARISON OF CHARACTERISTICS BETWEEN 42 WOMEN AND REST OF THE WOMEN IN THE SAMPLE: NEPAL, 1976

Characteristics	42 women	remaining women
Mean age at marriage (years)	16.7	16.5
Median age at marriage (years)	15.7	16.1
Mean duration of marriage (years)	22.9	23.8
Median duration of marriage(years)	22.4	23.9
Mean number of wastage pregnancies	0.6	0.2
Median number of wastage pregnancies	0.3	0.1
Mean number of children ever born in first five years of marriage	0.9	0.9
Median number of children ever born in first five year of marriage	0.9	0.8
Mean number of children ever born in past five years	1.2	0.8
Median number of children ever born in past five years	1.2	0.6
Mean first birth interval (months)	105	93
Median first birth interval (months)	43	49
Mean length of last closed interval (months)	77	72
Median length of last closed interval (months)	32	39
Mean length of open interval(months)	74	114
Median length of open interval(months)	35	59
Mean length of breastfeeding in open interval (months)	56	62
Median length of breastfeeding in open interval (months)	60	61
Mean length of breastfeeding in last closed interval (months)	21	18
Median length of breastfeeding in last closed interval (months)	30	24
% having knowledge on efficient family planning method	44	22
% current use of efficient family planning method	7	10
% not exposed	28	37

Source: The Nepal Fertility Survey, 1976, standard recode, version 1, London: ISI/WFS.

APPENDIX 4.9

RESULTS OF ANALYSIS OF VARIANCE: TEST OF SIGNIFICANCE ON CUMULATIVE FERTILITY OF CURRENTLY MARRIED WOMEN AGED 35-49 WITH AGE OF WOMAN AND AGE AT FIRST MARRIAGE AS COVARIATES, 1976

Source of variation	Sum of Squares	df	Mean Square	F	Significance of F
Main effects	148.576	6	24.763	3.936	0.001
V63 Geographical Region	52.460	2	26.230	4.169	0.016
V69 Ethnicity	45.325	1	45.325	7.204	0.007
V70 Work status of woman	3.852	1	3.852	0.612	0.434
V77 Education of husband	25.116	1	25.116	3.992	0.046
V79 Work status of husband	33.217	1	33.217	5.280	0.022
Covariates	1223.451	2	611.726	97.232	0.000
V4 Age of woman	317.768	1	317.768	50.508	0.000
V8 Age at first marriage	947.244	1	947.244	150.562	0.000
Explained	1372.027	8	171.503	27.260	0.000
Residual	9606.932	1527	6.291		
Total	10978.959	1535	7.152		

Notes: Covariate Raw regression coefficient

Covariate	Raw regression coefficient
V4	0.110
V8	-0.192

1604 Cases were processed.

Source: The Nepal Fertility Survey(1976), standard recode, version 1, London: ISI/WFS.

APPENDIX 4.10

RESULTS OF ANALYSIS OF VARIANCE: TEST OF SIGNIFICANCE ON CURRENT FERTILITY OF CURRENTLY MARRIED WOMEN AGED 15-34: NEPAL, 1976

Source of variation	Sum of squares	Degrees of freedom	Mean square	F-value	Significance of F-value
Main effects	10.321	8	1.290	1.560	0.132
1. Geographical region	6.867	2	3.434	4.151	0.016
2. Religion	0.100	1	0.100	0.120	0.729
3. Ethnicity	0.749	1	0.749	0.906	0.341
4. Education of spouse	0.211	1	0.211	0.255	0.614
5. Work status of spouse	3.301	3	1.100	1.330	0.263
Covariates	10.671	2	5.336	6.450	0.002
6. Age of woman	7.010	1	7.010	8.475	0.004
7. Age at marriage	1.318	1	1.318	1.594	0.207
Explained	20.993	10	2.099	2.538	0.005
Residual	2123.382	2567	0.827		
Total	2144.374	2577	0.832		

Covariates	Raw regression coefficient
Age of woman	0.013
Age at marriage	0.010

2765 Cases were processed.

Source: The Nepal Fertility Survey(1976), standard recode, version 1, London: ISI/WFS.

APPENDIX 4.11

UNADJUSTED AND ADJUSTED DEVIATIONS FROM GRAND MEAN NUMBER OF CHILDREN EVER BORN IN THE FIVE YEARS PRECEDING THE SURVEY TO CURRENTLY MARRIED WOMEN AGED 15-34 WHO HAVE BEEN MARRIED AT LEAST FIVE YEARS ACCORDING TO SELECTED BACKGROUND CHARACTERISTICS WITH AGE OF WOMAN AND AGE AT FIRST MARRIAGE AS COVARIATES, 1976
(GRAND MEAN = 1.49)

Variable + category	N	Unadjusted deviation	eta	Adjusted for independents deviation	beta	Adjusted for independents +covariates deviation	beta
Geographical region							
Mountains	180	-0.15		-0.17		-0.18	
Hills	1258	-0.01		-0.02		-0.02	
Plains	1140	0.04		0.05		0.05	
			0.05		0.06		0.06
Ethnicity							
Mongoloids	629	0.02		0.03		0.02	
Others	1949	-0.01		-0.01		-0.00	
			0.01		0.02		0.01
Religion							
Hindu	2385	0.00		0.00		0.00	
Non-Hindu	193	-0.00		-0.02		-0.02	
			0.00		0.01		0.01
Education of spouse							
Both have no schooling	1738	-0.00		-0.01		-0.01	
At least one has some schooling	840	0.01		0.01		0.02	
			0.00		0.01		0.02
Work status of spouse							
Wife not working-husband with non-farm occupation	401	-0.03		-0.05		-0.05	
Wife working-husband with non-farm occupation	182	-0.11		-0.09		-0.09	
Wife not working-husband with farm occupation	1156	0.02		0.01		0.01	
Wife working-husband with farm occupation	839	0.01		0.03		0.02	
			0.04		0.04		0.04
Multiple R squared					0.005		0.010
Multiple R					0.069		0.099

Source: The Nepal Fertility Survey(1976), standard recode,version 1, London: ISI/WFS.

APPENDIX 4.12

RESULTS OF ANALYSIS OF VARIANCE: TEST OF SIGNIFICANCE ON CURRENT FERTILITY OF CURRENTLY MARRIED WOMEN AGED 35-49: NEPAL, 1976

Source of variation	Sum of squares	Degrees of freedom	Mean square	F-value	Significance of F-value
Main effects	16.770	8	2.096	3.177	0.001
1. Geographical region	1.615	2	0.807	1.224	0.294
2. Religion	0.024	1	0.024	0.036	0.849
3. Ethnicity	0.007	1	0.007	0.011	0.918
4. Education of spouse	3.461	1	3.461	5.245	0.022
5. Work status of spouse	7.051	3	2.350	3.562	0.014
Covariates	174.461	2	87.231	132.202	0.000
6. Age of woman	168.711	1	168.711	255.689	0.000
7. Age at marriage	8.794	1	8.794	13.328	0.000
Explained	191.231	10	19.123	28.982	0.000
Residual	998.320	1513	0.660		
Total	1189.551	1523	0.781		

Covariates	Raw regression coefficient
Age of woman	-0.080
Age at marriage	0.020

1594 Cases were processed.

Source: The Nepal Fertility Survey(1976), standard recode, version 1, London: ISI/WFS.

APPENDIX 4.13

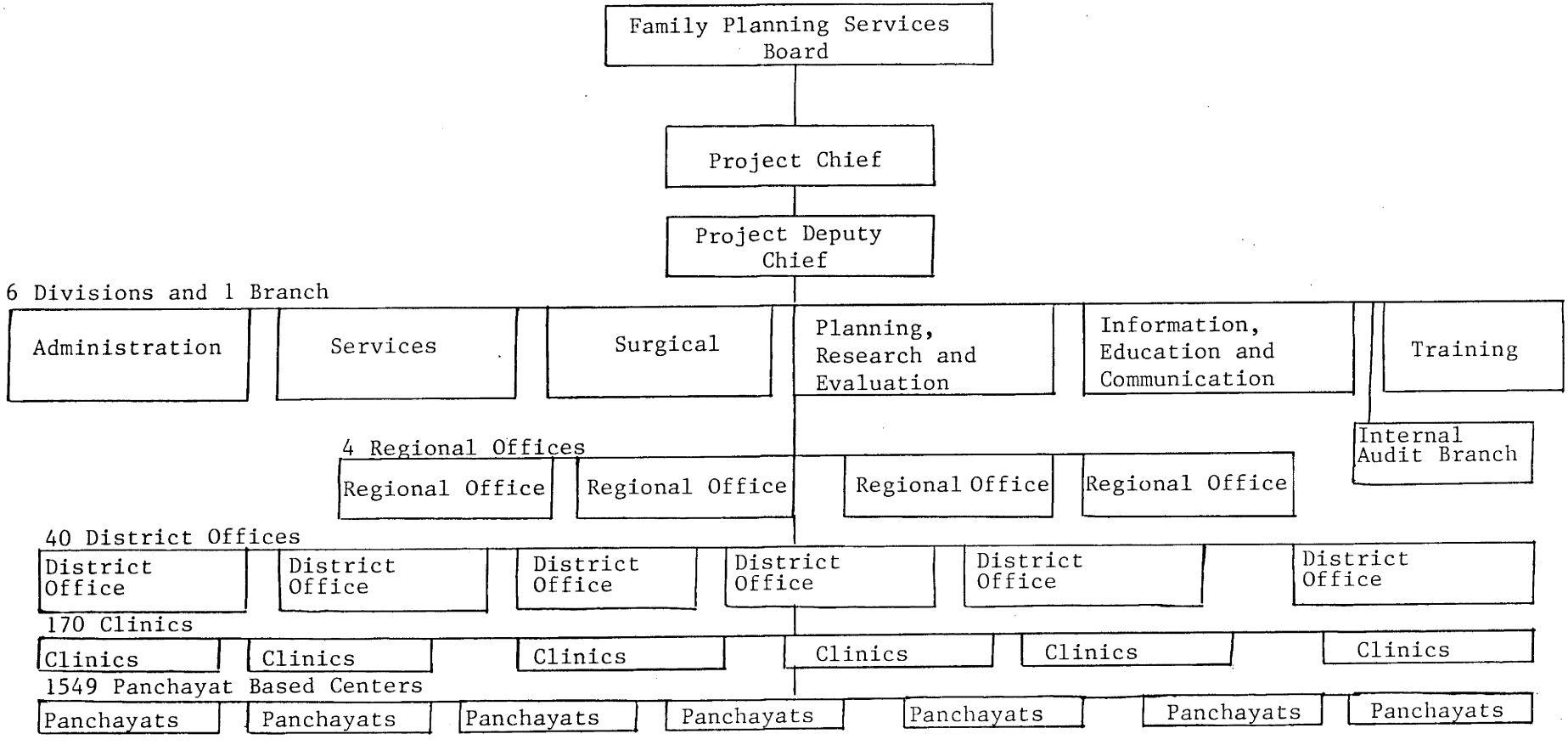
UNADJUSTED AND ADJUSTED DEVIATIONS FROM GRAND MEAN NUMBER OF CHILDREN EVER BORN IN THE FIVE YEARS PRECEDING THE SURVEY TO CURRENTLY MARRIED WOMEN AGED 35-49 WHO HAVE BEEN MARRIED AT LEAST FIVE YEARS ACCORDING TO SELECTED BACKGROUND CHARACTERISTICS WITH AGE OF WOMAN AND AGE AGE AT FIRST MARRIAGE AS COVARIATES: NEPAL, 1976
(GRAND MEAN = 0.80)

Variable + category	N	Unadjusted deviation	eta	Adjusted for independents deviation	beta	Adjusted for independents +covariates deviation	beta
Geographical region							
Mountains	138	0.14		0.10		0.08	
Hills	814	0.01		-0.02		0.00	
Plains	572	-0.04		0.00		-0.02	
			0.06		0.04		0.03
Ethnicity							
Mongoloids	436	0.04		0.00		0.01	
Others	1088	-0.02		0.00		0.00	
			0.03		0.00		0.01
Religion							
Hindu	1378	0.00		0.00		0.00	
Non-Hindu	193	0.01		0.01		0.01	
			0.00		0.00		0.00
Education of spouse							
Both have no schooling	1738	0.03		0.02		0.03	
At least one has some schooling	248	-0.15		-0.11		-0.14	
			0.07		0.06		0.07
Work status of spouse							
Wife not working-husband with non-farm occupation	185	-0.13		-0.11		-0.07	
Wife working-husband with non-farm occupation	76	-0.16		-0.16		-0.17	
Wife not working-husband with farm occupation	702	-0.03		-0.02		0.00	
Wife working-husband with farm occupation	561	0.10		0.08		0.05	
			0.10		0.08		0.06
Multiple R squared					0.014		0.161
Multiple R					0.119		0.401

Source: The Nepal Fertility Survey(1976), standard recode,version 1, London: ISI/WFS.

Appendix 5.1

Organization Chart of Nepal Family Planning and Maternal Child Health Project

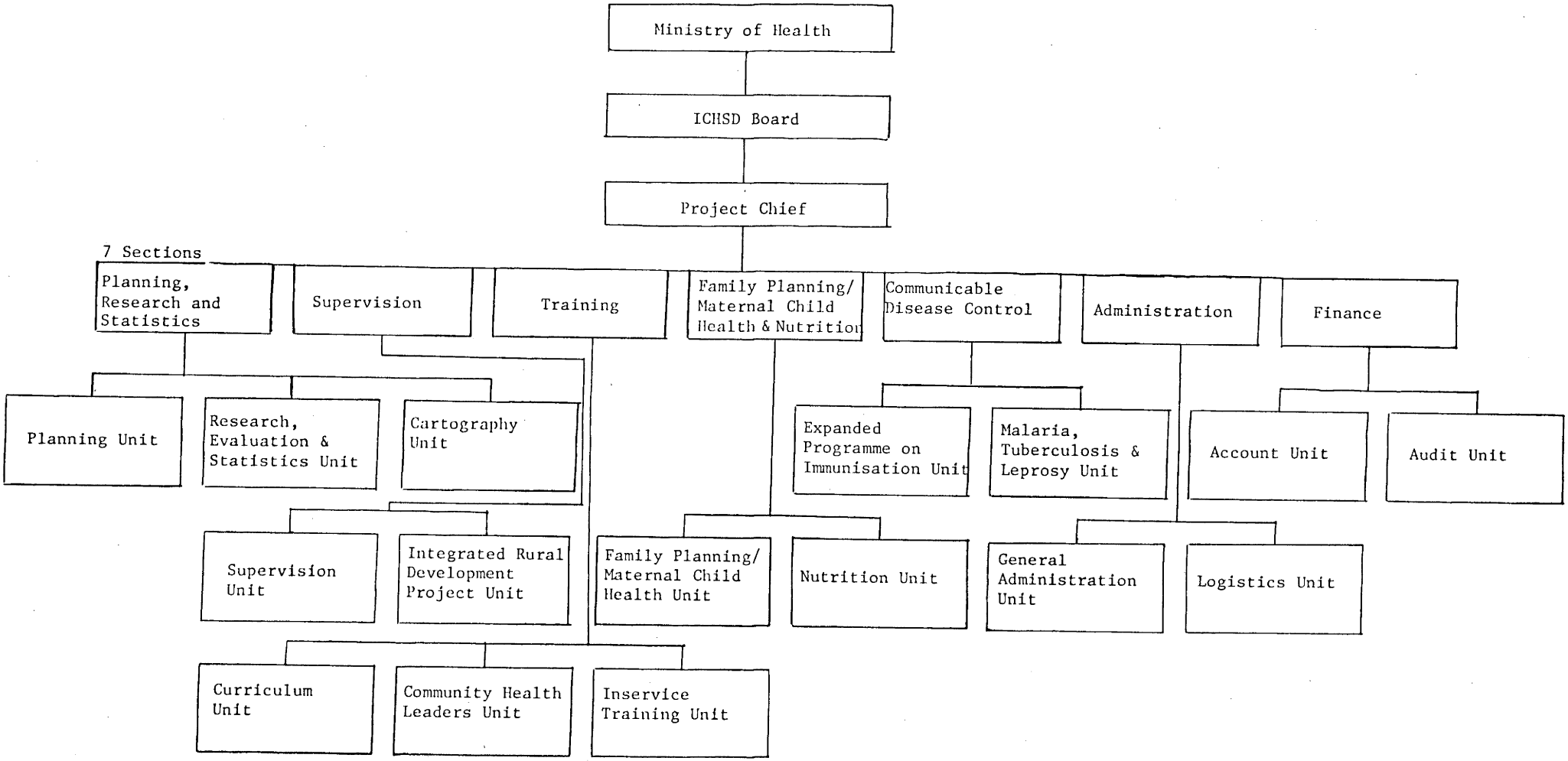


Source: Nepal FP/MCH Project (no date), 'Annual Report of 2038/039', p.5.

Note: Number of clinics and Panchayat Based Centers are different from the annual report as they are based on the recent information.

Appendix 5.2

Organization Chart of Integrated Community Health Services Development Project



Source: Ministry of Health (1982), 'Annual Report of the Integrated Community Health Services Development Project 2037-38'(1980-81), p.39.

APPENDIX 6.1

PERCENTAGE DISTRIBUTION OF CURRENTLY MARRIED, NOT PREGNANT WOMEN AMONG THOSE WHO KNEW ABOUT A FAMILY PLANNING SERVICE OUTLET ACCORDING TO PERCEIVED ACCESSIBILITY (TIME REQUIRED TO TRAVEL TO REACH AN OUTLET) BY PLACE OF RESIDENCE, 1981

Time required to travel	Place of residence		
	Rural	Urban	Total
Less than half-hour	11.1	75.4	18.5
Half-hour	9.7	12.7	10.1
One hour	13.8	5.6	12.9
Two hours	23.4	2.2	21.0
Three hours	18.8	2.2	16.9
Four hours or more	20.1	0.3	17.9
Don't know	2.9	1.6	2.8
Total	100.0	100.0	100.0
Number of women	1538	198	1736

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

APPENDIX 6.2

PERCENTAGE OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO KNEW A FAMILY PLANNING SERIVCE OUTLET BY SELECTED DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS, 1981

Selected characteristics	Number of women	Percent who knew an outlet
Age of woman		
15-24	1538	32.1
25-34	2028	35.8
35-44	1301	30.9
45-49	408	28.6
Number of living children		
0	879	26.5
1	908	29.7
2	1004	32.8
3	886	35.7
4	656	37.0
5 or more	940	36.7
Number of living sons		
0	1599	28.9
1	1562	33.4
2	1212	34.1
3 or more	866	37.5
Education of woman		
No schooling	4992	30.0
Some schooling	350	68.6
Work status of woman		
No work	2403	31.1
Farming	2336	31.6
Non-farming	531	47.2
Place of residence		
Rural	4969	31.0
Urban	305	64.9
Ethnicity		
Newars	281	47.1
Brahmins	499	42.4
Chhetris	606	28.4
Thakuris	86	30.0
Tharus	223	27.6
Magars	292	20.8
Gurungs	170	11.0
Rais	127	16.6
Tamangs	124	8.8
Muslims	164	39.4
Desire for more children		
Desire more	2569	31.3
Desire no more	2228	36.8
Don't know	478	23.2
Husband-wife communication		
Yes	1046	48.8
No	4209	29.0
Total	5276	32.9

Source: The Nepal Contraceptive Prevalence Survey Data,1981.

APPENDIX 6.3

PERCENTAGE OF CURRENTLY MARRIED, NOT PREGNANT WOMEN WHO KNEW AN OUTLET BY ETHNICITY BY EDUCATION, WORK STATUS OF WOMAN, PLACE OF RESIDENCE, DESIRE FOR MORE CHILDREN AND HUSBAND-WIFE COMMUNICATION, 1981.

	Education of woman		Work status of woman			Place of residence		Desire for more children		H-W communication		
Ethnicity	No schooling	Some	No Work	Farming	Non-Farming	Rural	Urban	Yes	No	Yes	No	Total
Newars	42.0	68.2	47.1	36.9	62.9	33.8	76.7	40.5	49.4	68.0	39.4	47.1
Brahmins	35.1	73.9	49.5	27.9	62.9	40.4	70.7	39.8	47.6	67.7	33.9	42.4
Chhetris	24.0	76.7	30.6	24.8	42.3	26.6	(72.9)	25.5	35.6	41.8	24.3	28.4
Thakuris	29.8	*	(18.1)	29.9	*	28.6	*	30.5	34.4	55.0	17.0	30.0
Tharus	25.5	(67.3)	28.4	27.7	25.2	27.9	*	30.4	23.1	37.8	24.9	27.6
Magars	19.4	(48.1)	15.4	34.7	(42.5)	20.2	*	15.7	27.5	35.4	17.0	20.8
Gurungs	9.3	*	20.0	3.9	*	9.2	*	8.0	15.9	(26.2)	8.9	11.0
Rais	15.3	*	15.8	-	*	15.2	*	22.0	14.9	*	14.6	16.6
Tamangs	8.9	*	6.7	8.3	*	8.2	*	12.9	10.9	(17.3)	8.0	8.8
Muslims	38.3	*	36.2	29.0	68.1	38.4	*	41.7	36.6	46.2	38.0	39.4

Notes: An asterisk * denotes cell where denominator is less than 10 women and a parenthesis () denotes cell where denominator is less than 25 but more than 10 women.

Source:The Nepal Contraceptive Prevalence Survey Data, 1981.

APPENDIX 6.4A

NEPAL FERTILITY SURVEY, 1976: QUESTIONS ON CONTRACEPTION

12.

SECTION 3: CONTRACEPTIVE KNOWLEDGE AND USE

301. There are methods that people can use to avoid getting pregnant when they do not want to. This is called family planning.

Have you ever heard about family planning, that is that people can do something to avoid or delay getting pregnant wher they do not want to.

YES [1] NO [2] (SKIP TO 303) ☐ 17

302. Do you know of, or have you heard of, any ways or methods to delay a pregnancy or avoid pregnancy?

YES [1] NO [2] ☐ 18

303. Just to make sure let me describe some methods of family planning to see if you have heard of them.

(SKIP TO 307)

304. Which family planning methods do you know of?

_____

_____

_____

PROBE: Do you know of any others?

(RECORD ANSWERS AND TICK BOXES IN COL. 1 CORRESPONDING TO THE METHOD(S) MENTIONED)

Not coded

305. FOR EACH METHOD EXCEPT STERILIZATION ASK:

Have you ever used _____ (METHOD)?

TICK APPROPRIATE BOXES IN COL.3

IF PILL, CONDOM MENTIONED, ASK:

Are there any such (pills, condoms) in your house now?

TICK APPROPRIATE BOXES IN COL. 4

306. NOW ASK 307-313 IN TURN SKIPPING THOSE METHODS TICKED IN COLUMN 1. BEGIN BY ASKING:

There are some other methods which you have not mentioned, and I would like to find out if you might have heard of them.

13.

COL 1 FROM 304		COL 2 EVER HEARD OF	COL 3 EVER USED	COL 4 IN HOME NOW	
[0] PILL	307. One way a woman can delay the next pregnancy, or avoid getting pregnant, is to take a pill every day.				[ ][ ][ ] 19 20 21
	COL.2. Have you ever heard of this method? TICK RESPONSE IN COL 2 (IF 'NO' SKIP TO NEXT UNTICKED METHOD)	YES [1] NO [2]			
	COL.3. Have you ever used this method? TICK RESPONSE IN COL 3 (IF 'NO' SKIP TO NEXT UNTICKED METHOD)		YES [1] NO [2]		
	COL.4. Are there any such pills in your home now? TICK RESPONSE IN COL.4			YES [1] NO [2]	
[0] IUD (LOOP)	308. A woman may have a loop inserted in her womb by a doctor.				[ ][ ] 22 23
	COL.2. Have you ever heard of this method? (IF 'NO' SKIP TO NEXT UNTICKED METHOD)	YES [1] NO [2]			
	COL.3. Have you ever used this method?		YES [1] NO [2]		
[0] CONDOM	309. There are also some methods men use so that their wives will not get pregnant. Some men wear a condom so their wives won't get pregnant.				[ ][ ][ ] 24 25 26
	COL.2. Have you ever heard of this method? (IF 'NO' SKIP TO NEXT UNTICKED METHOD)	YES [1] NO [2]			
	COL.3. Did you and your husband ever use this method? (IF 'NO' SKIP TO NEXT UNTICKED METHOD)		YES [1] NO [2]		
	COL.4. Are there any condoms in your home now?			YES [1] NO [2]	

14.

COL 1 FROM 304		COL 2 EVER HEARD OF	COL 3 EVER USED	COL 4 IN HOME NOW	
[0] ABSTAIN	310. Another way is to stay away from your husband for several months or longer to avoid getting pregnant. COL.2. Have you ever heard of this method? (IF 'NO' SKIP TO NEXT UNTICKED METHOD) COL 3. Have you ever done this to avoid getting pregnant?	YES [1] NO [2]	YES [1] NO [2]		27 28
[0] FEMALE STERIL.	311. Some women have an operation called laparoscopy in order not to have any more children. COL 2. Have you ever heard of this method?	YES [1] NO [2]			29
[0] MALE STERIL.	312. Some men have a sterilization operation called vasectomy, so that their wife will not have more children. COL 2. Have you ever heard of this method?	YES [1] NO [2]			30
[0] OTHER	313. Have you ever heard of any other methods which women or men use to avoid pregnancy? YES [1] NO [2] (SKIP TO 314) What methods have you heard of?(LIST EACH METHOD BELOW AND ASK: COL 3. Have you ever used this method?				31
	1		YES [1] NO [2]		32 34
	2		YES [1] NO [2]		35 37
	3		YES [1] NO [2]		38 40

15.

314. INTERVIEWER: TICK APPROPRIATE BOX

AT LEAST ONE YES IN COL. (3) [1] (SKIP TO 317)

NOT A SINGLE YES IN COL. (3) [2] ☐ 41

315. I want to make sure I have the correct information. Have you ever done anything or tried in any way to delay or avoid getting pregnant?

YES [1] NO [2] (SKIP TO 319) ☐ 42

316. What method was that?

_____

_____ ☐☐ 43

317. Which was the first method you used to delay or avoid pregnancy?

_____

_____ ☐☐ 45

(METHOD)

318. How many living children did you have when you first used that method?

_____ ☐☐ 47

(NUMBER)

319. INTERVIEWER: TICK APPROPRIATE BOX (SEE 314 AND COL.2 FOR 307, 312 AND 313)

HEARD OF FAMILY PLANNING [1]

NEVER HEARD OF FAMILY PLANNING [2] (SKIP TO 334) ☐ 49

320. Do you know where you can go to get family planning advice or supplies?

YES [1] NO [2] (SKIP TO 334) ☐ 50

16.

321. Where can you go? (PROBE: What kind of place is that?) (TICK ALL MENTIONED)

FAMILY PLANNING CLINIC [1]
HOSPITAL [2]
FAMILY PLANNING FIELD WORKER [4]
PHARMACY [8]
OTHER _____
(SPECIFY)

(PROBE: Do you know of anywhere else you can go for this purpose? _____)

51

322. What is the distance from your house to the nearest place where you can go to get family planning advice or supplies?

_____ D.K. [88]

(INTERVIEWER: RECORD DISTANCE AS SPECIFIED BY RESPONDENT)

53

323. How long would it normally take you to get there?

_____ (INTERVIEWER: RECORD BEST ESTIMATE) D.K. [88]
(MINUTES)

55 57

324. Have you yourself ever gone to a _____

(ALL PLACES AND/OR PERSONS MENTIONED) to get family planning advice or supplies?

YES [1] NO [2]
(SKIP TO 334)

58

325. Which way would you prefer to obtain family planning advice and supplies? Would you prefer to go to a family planning clinic or hospital, or a pharmacy or to have a family planning field worker visit you?

FAMILY PLANNING CLINIC [1]
HOSPITAL [2]
FAMILY PLANNING FIELD WORKER [3]
PHARMACY [4]
OTHER _____
(SPECIFY)

59

326. Did you go for family planning advice or supplies in the last twelve months?

YES [1] NO [2]
(SKIP TO 332)

60

17.

327. Where have you gone in the last twelve months for family planning advice or supplies? (TICK ALL MENTIONED)

FAMILY PLANNING CLINIC [1]

HOSPITAL [2]

FAMILY PLANNING FIELD WORKER [4]

PHARMACY [8]

OTHER _____ (SPECIFY) [ ][ ] 61

(PROBE: Anywhere else you have gone in the last twelve months?) _____

328. Where did you go the last time?

FAMILY PLANNING CLINIC [1]

HOSPITAL [2]

FAMILY PLANNING FIELD WORKER [3] [ ] 63

PHARMACY [4] (SKIP TO 330)

OTHER _____ (SPECIFY) (SKIP TO 330)

329. Were you satisfied with the attention you got on your last visit?

YES [1] NO [2] [ ] 64

330. Will you be going to _____ (LAST PLACE OR PERSON VISITED) in the future when you need family planning advice or supplies?

YES [1] (SKIP TO 334) NO [2] WILL NOT NEED AGAIN [3] (SKIP TO 334) [ ] 65

331. Why is it that you will not go back there in the future?

_____ (SKIP TO 334) [ ] 66

332. Since you didn't go there in the last twelve months did you think about going there to get family planning advice or supplies?

YES [1] NO [2] (SKIP TO 334) [ ] 67

333. Why didn't you go then?

_____

(PROBE: Any other reason?) [ ] 68

APPENDIX 6.4B

NEPAL CONTRACEPTIVE PREVALENCE SURVEY, 1981: QUESTIONS ON CONTRACEPTION

TABLE I

Method	201. (1) Have you heard of family planning method? If "Yes" what are they? If "No" skip to Q.202.	202. (2) Have you heard (name of each) method not circled in column 1.	203. (3) Have you or your spouse ever used (name) of each method circled "Yes" in column 1 & 2.	204. (4) What method are you currently using to prevent pregnancy?
01. Pill	1 Yes	2 Yes 3 No	1 Yes 2 No	1 Yes
02. Condom	1 Yes	2 Yes 3 No	1 Yes 2 No	1 Yes
03. IUD	1 Yes	2 Yes 3 No	1 Yes 2 No	1 Yes
04. Female Sterilization	1 Yes	2 Yes 3 No	1 Yes 2 No	1 Yes
05. Male Sterilization	1 Yes	2 Yes 3 No	1 Yes 2 No	1 Yes
06. Injectables	1 Yes	2 Yes 3 No	1 Yes 2 No	1 Yes
07. Traditional Methods (Specify)	1 Yes	2 Yes 3 No	1 Yes 2 No	1 Yes
08. Other (Specify)	1 Yes	2 Yes 3 No	1 Yes 2 No	1 Yes

Knowledge 57 59 61 63 65 67 69 71

Ever Use 58

Current Method 73 74

Interviewer: If the respondent knows no method (no "yes" codes in column 1 or 2, terminate interview.

If the respondent has never used a method (no "yes" code in column 3) go to instructions on page 9.

TABLE 11

INTERVIEWER: IF RESPONDENT HAS KNOWLEDGE OF METHODS 01-06 ("YES" CODES CIRCLED IN COLUMN 1 OR 2) CIRCLE THE METHOD AT THE TOP OF TABLE II.

INTERVIEWER: IF RESPONDENT IS CURRENTLY USING (*YES" CODE IN COLUMN 4 TABLE I) CROSS OUT (X) THAT METHOD AT THE TOP OF TABLE II.

INTERVIEWER: FOR EACH METHOD CIRCLED BUT NOT CROSSED OUT ASK Q.205 AND CIRCLE THE APPROPRIATE ANSWER. FOR EACH METHOD CIRCLED AND CROSSED OUT ASK Q.210 - 211.

TABLE II

		Pill	Condom	IUD	Female Ster.	Male Ster.	Inject.
205.	Do you know where you or your spouse can get method _____? (If no skip to Q212 after asking about each method known)	1 Yes 2 No	1 Yes 2 No	1 Yes 2 No	1 Yes 2 No	1 Yes 2 No	1 Yes 2 No
206.	If you wanted to get (_____) method to what place would you go?						
207.	How much do _____(method) cost there? IF FREE GO TO Q.209	Per Cycle Free	Rs____ for ____				
208.	Is this price expensive or inexpensive? 1. Expensive 2. Inexpensive 4. Don't know						
209.	How would you get to that place to get(method)?						
210.	How long would it take you to get there?						
211.	Would you consider this place convenient or inconvenient? 1. Convenient 2. Inconvenient 3. Don't know						

212. If you want family planning information what channel of information you prefer?

57

- Radio ☐
- Health Worker ☐
- Committee Meeting ☐
- Cinema/movie ☐
- Pamphlet ☐
- Poster ☐
- Others (SPECIFY) ☐

INTERVIEWER: CIRCLE BELOW THE METHOD THE RESPONDENT IS CURRENTLY USING FROM COLUMN 4 OF TABLE I. IF RESPONDENT IS CURRENTLY USING NO METHOD, CIRCLE 98 (NONE) IN TABLE III BELOW.

TABLE III

01	Pill	----(SKIP TO Q.213)
02	Condom	
03	IUD	---(SKIP TO Q.214)
04	Female Sterilization	
05	Male Sterilization	
06	Injectables	
07	Other_____ (Specify)	----(SKIP TO Q.219)
98	None	----------(SKIP TO Q.221)

213. If you would like to have additional family planning supplies, where would you prefer to go to get them?

58

- Clinic/hospital ☐
- Shop ☐
- Home (delivery) ☐

214. Has the family planning worker visited you within the last three months?

59

Yes ☐ No ☐

215. You told me that you used (method), did you experience any side-effects?

60

Yes ☐ No ☐

SKIP TO Q. 218

216. What are they? _____

61

217. With whom did you talk about that side-effect? _____

63

218. Where did you or your spouse get (method)?

Health post/hospital ☐ Others ☐ 64
Drugstore ☐
General shop ☐
Family planning center ☐
Mobile camps ☐

219. Have you ever gotten pregnant while using a family planning method? 65

Yes ☐ No ☐

220. Which method was that? 66

Pill ☐
Condom ☐
IUD ☐
Female Sterilization ☐
Male Sterilization ☐
Injectables ☐
Traditional Methods ☐
Other _____(SPECIFY) ☐

TERMINATE INTERVIEW

221. Up to now, what is the reason for not using a family planning method?

Desire additional children ☐ Not needed ☐ 68
Health condition ☐ Desire son ☐
Services or method not available ☐ Other _____ (SPECIFY) ☐

PROBE: Are there any other reasons?

_____
_____
_____

222. Have you or your spouse thought of using any family planning method in the future? 70

Yes ☐ No ☐ Don't know ☐

INTERVIEWER'S OPINION:

- With what probe or question was the age of respondent found? ☐ 71

- What was your opinion about the reliability of answers given by respondents on the following questions:

202. Prompted Knowledge

1 2 3 4 5 6 7 8 9
Unreliable Reliable ☐ 72

203. Ever use

1 2 3 4 5 6 7 8 9
Unreliable Reliable ☐ 73

204. Current Use

1 2 3 4 5 6 7 8 9
Unreliable Reliable ☐ 74

- Overall cooperativeness in interview

1 2 3 4 5 6 7 8 9
Uncooperative Cooperative ☐ 75

- Who was present during family planning questions? ☐☐ 76

Nobody present ☐ Husband ☐ Other male ☐

Children ☐ In-laws ☐ Other female ☐

APPENDIX 7.1

ESTIMATION OF ODDS-RATIO

Suppose there are three categories in a variable X. n_i equals the number of cases in ith category where i = 1 to 3. The GLIM produces log odds ratio for the second and third categories i.e. b_2 and b_3 which are relative to b_1. Thus, to convert to $\overset{*}{b}_1$, $\overset{*}{b}_2$ and $\overset{*}{b}_3$ so that b_1^* measures the difference from the overall mean, we have

$$n_1 b_1^* + n_2 b_2^* + n_3 b_3^* = 0 \qquad \text{(i)}$$

The GLIM calculates b_2 and b_3 as follows:

$$b_2 = b_2^* - b_1^* \qquad \text{(ii)}$$

$$b_3 = b_3^* - b_1^* \qquad \text{(iii)}$$

or,

$$b_2^* = b_2 + b_1^* \qquad \text{(iv)}$$

$$b_3^* = b_3 + b_1^* \qquad \text{(v)}$$

Substituting the values from equations (iv) and (v) in equation (i),

we get,

$$n_1 b_1^* + n_2(b_2 + b_1^*) + n_3(b_3 + b_1^*) = 0$$

or,

$$n_1 b_1^* + n_2 b_1^* + n_3 b_1^* + n_2 b_2 + n_3 b_3 = 0$$

or,

$$b_1^* (n_1 + n_2 + n_3) + n_2 b_2 + n_3 b_3 = 0$$

or,

$$b_1^* (N) + n_2 b_2 + n_3 b_3 = 0$$

Therefore,

$$b_1^* = -(n_2 b_2 + n_3 b_3)/N \qquad \text{(vi)}$$

Other values such as b_2^* and b_3^* are obtained from equations (iv) and (v).

APPENDIX 7.2

LOGIT-LINEAR MODELS OF MAIN EFFECTS OF DEMOGRAPHIC FACTORS ON CURRENT CONTRACEPTIVE USE AMONG WOMEN DESIRING NO MORE CHILDREN IN NEPAL, 1981.

Demographic Variable	Number of women (821) [2]	Effects X^2_{LR}	P	Odds-ratio	Adjusted proportion
Age of woman		5.4	0.10		
15-24	71			0.841	0.3584
25-34	338			1.217	0.4470
35-49	412			0.877	0.3680
Number of living children[1]		15.0	<.001		
0-1	30			0.414	0.2157
2-3	293			0.728	0.3259
4 or more	498			1.271	0.4577
Sex composition of living children[1]		18.1	0.005		
All sons	93			1.424	0.4860
Sons > Daughters	295			1.255	0.4546
Sons = Daughters	178			0.973	0.3925
Sons < Daughters	227			0.822	0.3530
All daughters	28			0.165	0.0987
Number of child loses[1]		10.9	0.005		
0	398			1.293	0.4619
1-2	295			0.760	0.3355
3 or more	128			0.847	0.3598

Notes: [1] Controlled for all previous factors
[2] Total may not add up to 821 because of 'not reported' and 'don't know' cases in some variables
X^2_{LR} =Chi-squared likelihood ratio
P =level of significance

Source: The Nepal Contraceptive Prevalence Survey Data,1981.

APPENDIX 7.3

LOGIT-LINEAR MODELS TO THE TEST EFFECTS OF HUSBAND-WIFE COMMUNICATION ON FAMILY MATTERS ON CURRENT CONTRACEPTIVE USE AMONG WOMEN DESIRING NO MORE CHILDREN IN NEPAL, 1981

Variable[1]	Number of women (821) [5]	Gross Effects X^2_{LR}	Gross Effects Odds-ratio	Gross Effects Unadjusted proportion	Net Effects[2] X^2_{LR}	Net Effects[2] Odds-ratio	Net Effects[2] Adjusted proportion	Net Effect[3] X^2_{LR}	Net Effect[3] Odds-ratio	Net Effect[3] Adjusted proportion
Husband-wife communication[4]		* 87.8			* 95.1			* 83.6		
Yes	271		2.675	0.6398		3.059	0.6701		2.917	0.6595
No	550		0.590	0.2816		0.579	0.2776		0.592	0.2823

Notes:
[1] Husband-wife communication has one degree of freedom
[2] Effect of husband-wife communication is net of age, number of living children and sex composition of living children.
[3] Effect of husband-wife communication is net of age, number of living children, sex composition of living children, education and work-status.
[4] When controlled for the effects of age, number of living children and education, X^2_{LR} =80.7 for husband-wife communication effects with 1 degree of freedom, p=<.001.
[5] Total may not add up to 819 because of 'not reported' and 'don't know' cases in some variables.
* indicates chi-squared likelihood ratio is significant at 0.001 level.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

APPENDIX 7.4

LOGIT-LINEAR MODELS TO TEST THE EFFECTS OF EDUCATION AND WORK-STATUS OF WOMEN ON CURRENT CONTRACEPTIVE USE AMONG WOMEN DESIRING NO MORE CHILDREN IN NEPAL, 1981

Variable[1]	Number of women (821)[4]	Gross Effects: 2 X LR	Gross Effects: Odds-ratio	Gross Effects: Unadjusted proportion	Net Effects[2]: 2 X LR	Net Effects[2]: Odds-ratio	Net Effects[2]: Adjusted proportion	Net Effect[3]: 2 X LR	Net Effect[3]: Odds-ratio	Net Effect[3]: Adjusted proportion
Education		20.3 *			20.9 *			12.5 *		
No schooling	700		0.876	0.3678		0.868	0.3656		0.892	0.3721
Some schooling	121		2.147	0.5877		2.269	0.6010		1.933	0.5620
Work-status		27.2 *			24.1 *			14.4 *		
Farming	285		0.596	0.2836		0.606	0.2869		0.609	0.2878
Non-farming	136		1.173	0.4378		1.205	0.4445		1.071	0.4157
No work	400		1.369	0.4762		1.342	0.4712		1.148	0.4326

Notes: [1] Education and work-status respectively, have one and two degrees of freedom.
[2] Effect are net of age and number of living children.
[3] Effect of education is net of age, number of living children and place of residence, and effect work-status is net of age, number of living children, place of residence and education.
[4] Total may not add up to 821 because of 'not reported' and 'don't know' cases in variables.
* indicates chi-squared likelihood ratio is significant at 0.001 level.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

APPENDIX 7.5

LOGIT-LINEAR MODELS TO TEST THE EFFECTS OF PLACE OF RESIDENCE AND ACCESS TO A FAMILY PLANNING SERVICE OUTLET ON CURRENT CONTRACEPTIVE USE AMONG WOMEN DESIRING NO MORE CHILDREN IN NEPAL, 1981

Variable[1]	Number of women (821)[4]	Gross Effects: 2 X LR	Gross Effects: Odds-ratio	Gross Effects: Unadjusted proportion	Net Effects[2]: 2 X LR	Net Effects[2]: Odds-ratio	Net Effects[2]: Adjusted proportion	Net Effect[3]: 2 X LR	Net Effect[3]: Odds-ratio	Net Effect[3]: Adjusted proportion
Place of Residence		19.3 *			20.9 *			8.2 **		
Rural	703		0.880	0.3688		0.873	0.3670		0.914	0.3777
Urban	118		2.141	0.5870		2.243	0.5983		1.711	0.5318
Access to the Family Planning outlet		40.3 *			39.8 *			25.1 *		
Less than one hour	278		1.868	0.5537		1.869	0.5538		1.748	0.5353
One-two hours	292		0.790	0.3440		0.823	0.3535		0.851	0.3609
Three hours+	251		0.658	0.3042		0.627	0.2940		0.650	0.3016

Notes:
[1] Place of residence and access to a family planning service outlet have, respectively, one and two degrees of reedom.
[2] Controlled for age and number of living children.
[3] Effect of place of residence is net of age, number of living children, education and work-status and effect of access to a family planning service outlet is net of age, number of living children and place of residence.
[4] Total may not add up to 821 because of 'not reported' and 'don't know' cases in some variables.
* indicates chi-squared likelihood ratio is significant at 0.001 level.
** indicates chi-squared likelihood ratio is significant at 0.005 level.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

APPENDIX 7.6

LOGIT-LINEAR MODELS TO TEST THE EFFECTS OF ACCESS TO A FAMILY PLANNING SERVICE OUTLET ON CURRENT CONTRACEPTIVE USE AMONG WOMEN DESIRING NO MORE CHILDREN IN RURAL NEPAL, 1981

Place of residence and access to an outlet	Number of women (703)	Gross Effects			Net Effects[1]		
		X^2_{LR}	Odds-ratio	Unadjusted proportion	X^2_{LR}	Odds-ratio	Adjusted proportion
Rural		82.5*			73.1*		
Less than one hour	172		3.217	0.6550		2.251	0.5704
One-two hours	283		1.275	0.4293		0.863	0.3374
Three hours or more	248		0.969	0.3638		0.674	0.2845

Notes: [1] Model consists of age, number of surviving children and distance from an outlet.
* indicates chi-squared likelihood ratio is significant at 0.001 level.

Source: The Nepal Contraceptive Prevalence Survey Data, 1981.

APPENDIX 8.1

CONVERSE
TABLE NO. 1: ECHO CHECK OF INPUT DATA
(NEPAL-DATA 1971-81)

RELEASE 1.41
SEP. 1978

ECHO CHECK OF INPUT DATA

INPUT NO. 1
NUM (NUMBER OF METHODS): 5
IPROJ (YEARS OF PROJECTION PERIOD): 10
INYR (INITAL YEAR): 1971
MIX (METHOD CHANGE OVER TIME: 1=STATIC, 2=DYNAMIC): 2
XUSE (0=NO INITAL USERS, 1=INITIAL USERS): 0
ABT (POSITION OF ABORTION AMONG METHODS CHOSEN): 0
NAME (PROGRAM NAME): NEPAL-DATA 1971-81

INPUT NO. 2: METHOD

CONDOM
ORAL PILLS
DEPO-PROVERA
STERILIZATION
IUD

INPUT NO. 3: ZO (OVERLAP OF USE, IN YEARS, WITH POSTPARTUM AMENORRHEA)

CONDOM	.200
ORAL PILLS	.175
DEPO-PROVERA	.175
STERILIZATION	.165
IUD	.275

INPUT NO. 4: RETA (PROPORTION OF ACCEPTORS NOT IMMEDIATELY DISCONTINUING USE)

METHOD	15-19	20-24	25-29	30-34	35-39	40-44
CONDOM	0.700	0.700	0.700	0.700	0.700	0.700
ORAL PILLS	0.668	0.668	0.668	0.668	0.668	0.668
DEPO-PROVERA	0.980	0.980	0.980	0.980	0.980	0.980
STERILIZATION	0.980	0.980	0.980	0.980	0.980	0.980
IUD	0.907	0.907	0.907	0.907	0.907	0.907

CONTD. NEXT PAGE

INPUT NO. 5: RETR (ANNUAL RATE OF DISCONTINUATION)

METHOD	15-19	20-24	25-29	30-34	35-39	40-44
CONDOM	0.900	0.900	0.900	0.900	0.900	0.900
ORAL PILLS	0.633	0.633	0.633	0.633	0.633	0.633
DEPO-PROVERA	0.343	0.343	0.343	0.343	0.343	0.343
STERILIZATION	0.080	0.080	0.080	0.080	0.080	0.080
IUD	0.343	0.343	0.343	0.343	0.343	0.343

INPUT NO. 6B: CCPCT (PROPORTION OF ALL ACCEPTORS OBTAINING EACH METHOD)

METHOD	YEAR 1	2	3	4	5	6	7	8	9	10
CONDOM	0.522	0.549	0.602	0.669	0.634	0.591	0.615	0.645	0.682	0.651
ORAL PILLS	0.362	0.370	0.314	0.274	0.271	0.263	0.255	0.229	0.225	0.227
DEPO-PROVERA	0.000	0.000	0.000	0.001	0.001	0.008	0.010	0.009	0.009	0.010
STERILIZATION	0.089	0.072	0.081	0.045	0.082	0.129	0.115	0.110	0.079	0.106
IUD	0.027	0.009	0.003	0.011	0.012	0.009	0.005	0.007	0.005	0.006

	INPUT NO. 7: FERM (MARITAL FERTILITY RATES)		INPUT NO. 8: PERM (PROPORTION MARRIED)		INPUT NO. 9: STER (PROPORTION STERILE)
AGE	YEAR 1	YEAR 11	YEAR 1	YEAR 11	
15-19	0.236	0.236	0.714	0.615	0.020
20-24	0.313	0.313	0.916	0.926	0.045
25-29	0.308	0.308	0.937	0.957	0.080
30-34	0.288	0.288	0.918	0.934	0.130
35-39	0.188	0.188	0.866	0.900	0.235
40-44	0.089	0.089	0.783	0.839	0.455

INPUT NO. 10

LFTAB (LIFE TABLE TYPE: 1=MODEL, 2=EMPIRICAL): 1
ITYPE (POPULATION SIZE AND DISTRIBUTION: 1=STABLE, 2=REAL): 1

CONTD. NEXT PAGE

INPUT NO. 11A
IREG (LIFE TABLE REGION: 1=WEST, 2=NORTH, 3=EAST, 4=SOUTH): 1
EX (LIFE EXPECTANCY AT BIRTH FOR WOMEN)

YEAR	1	2	3	4	5	6	7	8	9	10	11
EX	42.50	43.00	43.50	44.00	44.50	45.00	45.50	46.00	46.50	47.00	47.50

INPUT NO. 12A

POPD(18,1) (TOTAL FEMALE POPULATION IN INITIAL YEAR): 5738780.0
SR (SEX RATIO AT BIRTH): 1.01

INPUT NO. 13: OPTS (PRINTING OUTPUT OPTIONS: 0=TABLE NOT PRINTED, 1=TABLE PRINTED)

TABLE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
OPTS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

INPUT NO. 14B: CCDIST (YEAR 1 AGE DISTRIBUTION OF ACCEPTORS BY METHOD)

METHOD	15-19	20-24	25-29	30-34	35-39	40-44
CONDOM	4.17	20.58	23.60	27.77	16.63	7.25
ORAL PILLS	4.17	20.58	23.60	27.77	16.63	7.25
DEPO-PROVERA	4.17	20.58	23.60	27.77	16.63	7.25
STERILIZATION	0.36	5.81	28.68	34.85	20.87	9.43
IUD	4.26	25.56	27.57	25.06	10.78	6.77

INPUT NO. 15: IPICK (ACCEPTANCE MODEL TYPE): 2

INPUT NO. 16B: AACT (TOTAL ANNUAL ACCEPTORS AGE 15-44)

YEAR	1	2	3	4	5	6	7	8	9	10
AACT	43838.0	65095.0	86079.0	98312.0	138634.0	126532.0	174106.0	165774.0	196534.0	216010.0

APPENDIX 8.2

ESTIMATION OF CONTRACEPTIVE EFFECTIVENESS IN 1976 AND 1981, NEPAL.

Method	1976 Proportion of women using a given method u(m)	1981 Proportion of women using a given method u(m)	Method-specific use-effectiveness levels e(m)
Oral pills	0.005	0.012	0.90
IUD	0.001	0.001	0.95
Condom	0.003	0.004	0.70
Male sterilization	0.019	0.032	1.00
Female sterilization	0.001	0.026	1.00
Depo-provera	-	0.001	0.70
Total	0.029	0.076	

Average use-effectiveness 'e' for 1976= (0.005x0.90+0.001x0.95 +0.003x0.70+0.019x1.00+0.001x1.00+0x0.70)/0.029=0.95

Average use-effectiveness 'e' for 1981= (0.012x0.90+0.001x0.95 +0.004x0.70+0.032x1.00+0.026x1.00+0.001x0.70)/0.076=0.97

Sources: u(m) for 1976 based on the Nepal Fertility Survey 1976 data.
u(m) for 1981 based on the Nepal Contraceptive Prevalence Survey 1981 data.
e(m) adapted from the Phillipines (Bongaarts, 1982:note 14).