

Childhood immunization and pregnancy-related services in Guatemala*



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Abstract

In this paper we examine the experience of one poor country, Guatemala, that provided childhood immunization partly through a major national campaign, and provided pregnancy-related services through government health facilities, during the 1980s. Specifically, we compare the breadth of coverage of these two types of services using national sample survey data collected in 1987. We then draw upon results of previous qualitative studies to explore the social, cultural, and organizational factors that may account for differences between the use of immunization and the use of pregnancy-related health services.

Introduction

Child-survival programs, such as those sponsored by WHO, UNICEF, USAID and other international donors, dominated public-health activities in many developing countries during the 1980s. These programs generally focused on a limited number of simple strategies chosen to have the greatest impact on children's health for the lowest cost (Warren 1988; Grant 1993; Pebley 1993). Among the most successful components of these programs has been childhood immunization, administered through both mass campaigns and routine immunization in clinics (Gadomski and Black 1990; de Quadros et al. 1992; Kim-Farley et al. 1992). An important practical advantage of immunization programs, especially campaigns, is that, typically, they are not heavily dependent either on the efficacy of the public-health bureaucracy or on the existence or efficiency of local health facilities. Critics have argued, however, that circumvention of the extant health-care infrastructure is a disadvantage of this approach in the long run, because it diverts attention and funds away from institution-building essential for sustained long-term improvements in health (Habicht and Berman 1980; Rifkin and Walt 1986; Grodos and de Bethune 1988; Newell 1988; Unger 1991).

The success of immunization programs and concern about the limited range of health problems addressed in child-survival programs has led to a growing interest among international agencies and donors in using the experience and skills developed in these programs to tackle other maternal and child health issues (UNICEF 1990; Kim-Farley et al. 1992; Grant 1993). A major example is a new emphasis on improvement of care during pregnancy and childbirth which grew during the 1980s out of a focus on

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women's health (Mahler 1987; Kwast 1991), and increasing evidence of the importance of prenatal care and delivery assistance in affecting the health of both the mother and her child (Institute of Medicine 1985; Grant 1993). For example, the goals of the 1990 World Summit for Children, sponsored by the United Nations and UNICEF, add to the basic child-survival program a new effort to provide 'access to prenatal care, a trained attendant during childbirth and referral facilities for high-risk pregnancies and obstetrical emergencies' to all women (Grant 1993:59).

Aside from obvious differences in the administrative structure, in staff requirements and in cost, the equitable provision of pregnancy-related care in many poor countries is likely to involve operational, social, and cultural issues that are different and more complex than those faced in immunization campaigns and in most other interventions associated with child-survival programs. In this paper we examine the experience of one poor country, Guatemala, that provided childhood immunization partly through a major national campaign, and provided pregnancy-related services through government health facilities, during the 1980s. Specifically, we compare the breadth of coverage of these two types of services using national sample survey data collected in 1987. We then draw upon results of previous qualitative studies to explore the social, cultural, and organizational factors that may account for differences between the use of immunization and the use of pregnancy-related health services.

Childhood immunization and pregnancy-related services

Guatemala is among the poorest countries in Latin America, and has one of the highest mortality rates: the estimated ${}_5q_0$ in 1982-87 was 110 (MSPAS/INCAP 1989, Figure 2.1). Infectious and perinatal problems are the primary causes of death for children under age five. Adlakha and Arriaga (1990, Table 2) estimate that, in 1984, infectious and perinatal causes accounted for 37 per cent and 47 per cent of all deaths under the age of one year, and that infections accounted for 72 per cent of deaths to children aged one to four years.¹

Modern vaccination programs run by the Ministry of Public Health and Social Assistance (MSPAS) were begun in the 1970s. In 1971, the Ministry began a program of 'National Vaccination Crusades' directed toward immunizing children under five against measles and polio, during a two-month period, twice a year. However, during the late 1970s and early 1980s, as internal and external resources diminished, the activities of the crusades declined considerably. At the same time, epidemics of polio began to reappear in some of the regions of the country.

Partly in response to renewed polio outbreaks, the Guatemalan government, in collaboration with the Pan American Health Organization (PAHO) and other international agencies, developed an Expanded Program of Immunization in the department of Escuintla in 1983 and extended the program to six more departments in 1984. Shortly after the new civilian government took office in 1986, it decided to undertake a major immunization campaign targeted at children younger than five. The immunization days during 1986—May 17-18, July 5-6, and August 16-17—were chosen to provide three doses each of DPT and (oral) polio vaccine and one dose of measles vaccine. BCG was not a major component of the campaign, but was sometimes provided by campaign posts.

The 1986 immunization campaign involved social mobilization on a major scale. An evaluation of the campaign estimates that approximately 32,000 people, including 25,000 volunteers, were involved in carrying out campaign activities (MSPAS 1987). The popularity of the campaign and the support

¹ Of all deaths to infants, approximately 18 per cent were due to respiratory ailments and influenza, and 20 per cent to other infectious and parasitic diseases. Among children aged one to four years, 23 per cent of deaths were due to respiratory causes and influenza and 49 per cent to other infectious and parasitic diseases (Adlakha and Arriaga 1990).

from many public and private agencies was no doubt aided by a wave of public enthusiasm and optimism surrounding the first popularly-elected civilian government since the 1960s. The campaign apparently reached all parts of the country, with the exception of the relatively small Triangulo Ix'1 region in the department of Quiché in which political disruption interrupted campaign activities. A comparison of coverage levels achieved by routine public-health services with those obtained during campaigns (Goldman and Pebley 1993) shows that the vast majority of immunizations performed during 1986 were carried out as part of the immunization campaign. Immunizations during campaigns and in government and most private voluntary facilities have been provided free of charge.

No vaccination days were held in 1987 because of the nationwide political disruption caused by the election campaigns for mayoral positions. Immunization coverage increased dramatically in 1986 as a result of the campaign, but fell sharply in 1987, presumably because of the lack of immunization days. In subsequent years, immunization days have been held regularly. The MSPAS has also pursued a policy of 'channelization' of immunization, involving provision of immunization on a routine basis at health facilities and through visits by health personnel to the homes of unvaccinated children.

In the case of pregnancy-related services, both prenatal care and childbirth assistance are provided at government health facilities, primarily by physicians, nurses, and auxiliary nurses. The MSPAS has extended these services since the 1970s to the rural population through health posts and centres, and regional hospitals. Private physicians are another important source of pregnancy-related care, but are out of the reach of many poor women and rural residents, both because of their relatively high fees and because most practise in Guatemala City or departmental capitals. In contrast to immunization which is provided exclusively by biomedical practitioners, traditional midwives provide the majority of prenatal and delivery care, as is the case in many other countries (Isenalumbe 1990; Parra 1991). Despite governmental and private voluntary-agency programs to train traditional midwives, most do not have formal training (Bossert and Del Cid Peralta 1987).

Services provided at MSPAS health posts, centres, and hospitals at no or a nominal charge (five US cents per visit) are the cheapest alternative for prenatal care or delivery, although transportation to a hospital in the department capital can be expensive. Midwives, who often include the cost of prenatal visits in the price for delivery, are usually more expensive than MSPAS services, charging about 20 quetzals or \$US4 for a pregnancy, but considerably cheaper than private physicians and nurses. Unlike most private physicians, midwives are often willing to be paid in small instalments after the baby is delivered.

Non-biomedical health-belief systems and reliance on non-biomedical practitioners for treatment are common among both the indigenous and *ladino* populations² (Pebley and Goldman 1992), as in much of Latin America (Pedersen and Barauffati 1985). One obvious difference between prenatal care and assistance at delivery, on the one hand, and childhood immunization, on the other, is that pregnancy-related care is a recognized part of both traditional and biomedical Guatemalan health-belief systems,³ while immunization is exclusively associated with biomedical ideas of disease transmission and the immune system. The uneasy match between the ideas underlying immunization and local

² The indigenous or Indian population, i.e., descendants of Mayan and other pre-Spanish conquest groups, retain a separate identity and indigenous languages, and comprise approximately half the Guatemalan population. The other half, known as *ladinos*, speak Spanish exclusively, wear Western clothing, and identify themselves with the dominant Guatemalan culture.

³ Traditional midwives, who use techniques such as massage and herbal remedies to restore hot-cold imbalances, are probably the most numerous of traditional practitioners in Guatemala.

concepts of illness prevention and causation can be illustrated by the comments of a rural resident interviewed in the mid-1980s:

If one is sick and one gets an injection one gets cured fast. But the child is fine, and they give him a vaccination and he gets sick! Why give them a vaccination? It is a pity to prick them if they are not sick... (Rosenthal 1987:72)

As the above comment also indicates, therapeutic use of injections, for example, for administering antibiotics, is much more widely understood and accepted than immunization, as is true elsewhere (Reeler 1990; Wyatt 1992). Rosenthal (1987) reports, however, that in the village in which this informant lived, experience with childhood immunization eventually led to many parents accepting vaccination and believing in its value as a preventive measure.

In our previous research we found significant differences in the use of biomedical health services according to ethnicity and social and economic status (Pebley and Goldman 1992). The indigenous population is much less likely to use the services of physicians or the public health-care system when compared with *ladinos*, even those living in the same community. Both poor and rural Guatemalans, regardless of ethnic identification, are less likely to use biomedical services than middle- or upper-class urban dwellers. The fact that the indigenous population is more likely to live in rural areas and more remote parts of the country, and to be poorer and less educated than *ladinos*, contributes to the ethnic differentials.

Part of the existing variation in the use of biomedical health services is undoubtedly due to differential availability. For example, data for 1987 (not shown) indicate that the ratio of population to the number of government-run primary-care clinics⁴ was higher in municipalities⁵ located further from Guatemala City and in more highly indigenous areas, results which confirm a department-level analysis by von Hoegen (1986). However, variation in this ratio across geographic areas is relatively modest. Furthermore, MSPAS officials believe that the existing facilities of the rural health-care system in many areas are actually under-utilized by the local population (Vielman and Hurtado 1986; Villatoro and Hurtado 1986; Rosenthal 1987).

Use of immunization and pregnancy-related services

We use sample survey data to examine the use of biomedical pregnancy-related services and immunization in segments of the population that are typically more difficult to reach in Guatemala: the indigenous population (and especially those who do not speak Spanish), women with little or no formal education, the population living in more remote regions, and the population living at greater distances from government or private health clinics.

Data

Data for this analysis come from the National Survey of Maternal and Child Health (ENSMI) conducted in Guatemala in 1987 (MSPAS and INCAP 1989). It was based on a nationally representative sample of 5,160 women aged 15 to 44, interviewed between September and December of 1987. The survey included questions on prenatal care and delivery assistance for all 4,627 births in the five years before interview, and questions determining the immunization status of the 4,230 children who were born during this period and alive at the time of interview. The data do not allow us to distinguish midwives

⁴ Defined as MSPAS health posts and centres and IGSS (Social Security) clinics.

⁵ Guatemala is divided into 22 departments and each department is further subdivided into municipalities. There were 349 municipalities in 1987.

with formal training from others. However, as noted above, most midwives have no formal training and are not formally affiliated with government or private clinics. Only one (the 'most qualified') practitioner providing prenatal care and delivery assistance was coded for each pregnancy, regardless of how many different types of practitioners were consulted.

Data were collected for children alive at interview on eight childhood immunizations: three doses of DPT, three doses of polio vaccine, one dose of BCG (anti-tuberculosis), and one dose of measles vaccine. Information on immunization was copied from health cards and supplemented with maternal reports. Since previous research (Goldman and Pebley 1994) indicated that inclusion of maternal recall information in estimates of immunization coverage improved the accuracy of the estimates, the figures reported here rely on data of both types. Data from the ENSMI also include information on distance to the nearest 'clinic' (i.e., government health post or centre, a PVO facility, or private clinic) from about two-thirds of the clusters in which the survey was conducted. Results for these clusters do not differ substantially from those for all clusters (Pebley and Goldman 1992). The proportions of persons in each location who reported themselves to be indigenous come from municipality-level data in the 1981 census, and distance of the municipality centre from Guatemala City was measured as straight-line distance, using maps from the Guatemalan Geographic Institute.⁶

Unless otherwise indicated, the sample for this analysis consists of pregnancies leading to live births during the five years before the survey in the sample clusters for which information on clinic distance is available (n=3,467). All analyses involving immunization are based on the subsample of these children who were alive at time of interview and were at least one year of age (n=2,495). The restriction of immunization estimates to living children has probably resulted in a modest overestimate of immunization coverage, since results from other surveys suggest that children who died during infancy and childhood were less likely to have received immunizations than children still alive at the time of the survey (see, for example, Elo 1990). About seven per cent and eleven per cent of children born in the five-year period prior to the ENSMI are reported to have died before ages one and five respectively. To the extent that the subgroups with higher infant-mortality rates (e.g., women without schooling) experience lower immunization rates, the differentials by number of immunizations reported in Table 1 may be underestimated. Children under one were omitted from our sample because they had not yet reached the age of eligibility for some types of immunization, in contrast to children aged one and over, who were old enough to have received all the eight childhood immunizations specified above.⁷

Bivariate results

To determine how effectively the immunization program and pregnancy-related services reached a broad cross-section of the Guatemala population, we examine use of both types of services by the ethnicity of the family, maternal education, the ethnic composition of the community, the distance to the nearest primary-care clinic, and the remoteness of the municipality in which the child and mother

⁶ Whenever a municipality contained more than one sampling cluster, the value for the municipality was assigned to each sampling cluster within it.

⁷ The recommended ages of immunization in Guatemala are two, four and six months for the three doses respectively of polio and DPT; nine months for measles immunization; and at the time of birth for BCG. Estimates presented elsewhere (Pebley and Goldman 1992) indicate that there is virtually no difference in immunization coverage between the three cohorts aged two, three and four at the time of the DHS survey, but lower coverage for the cohort aged one. Although one-year olds were old enough to have received all the recommended vaccinations by the time of the survey, some were below the recommended ages at the time of the 1986 campaigns, when the majority of young Guatemalan children were immunized.

live from Guatemala City. The last variable is a combination of an urban-rural classification of the locality and, for rural localities, the distance between the municipal centre and Guatemala City.

In the first set of columns in Table 1, we show the distribution of the number of immunizations (0, 1-7, or 8) that children aged between one and four years received out of the full eight immunizations recommended by the MSPAS. Seven of the eight immunizations were offered in the 1986 immunization campaign, BCG being the exception. We estimate that approximately half of the immunizations for children in our sample were given during the 1986 campaign (Goldman and Pebley 1994).

Roughly half the *ladino* children, children whose mothers received some formal education, children living in predominantly *ladino* municipalities, children living within ten kilometres of the nearest clinic, and children living in urban areas had received all eight immunizations. Children in indigenous families were less likely to receive all eight immunizations, especially if their mothers did not speak Spanish. Levels of complete immunization were similarly low for children whose mothers received no formal education, and for children living in predominantly indigenous communities. Both the distance to the nearest clinic, and the remoteness of the municipality from urban life, are negatively related to the proportion of children who were fully immunized. Note, however, that the vast majority of each subgroup of children presented in Table 1 was at least partly immunized.

Comparison of the results for immunization with those for prenatal care and delivery assistance suggest that the observed differentials (e.g., by ethnicity or location) for complete immunization are much smaller than those for biomedical⁸ pregnancy-related care. For example, while children from indigenous, non-Spanish speaking families are about 0.60 (27.0/45.2) times as likely as *ladino* children to be fully immunized, they are less than one-quarter (10.2/43.9) as likely as *ladino* children to have received biomedical prenatal care while *in utero*, and less than one-tenth (2.7/38.1) as likely as *ladino* children to have been delivered by a physician or nurse. The immunization program seems to have been more successful in reaching the indigenous population and those living in more remote areas than were biomedically-based prenatal care and delivery services.

The results in Table 1 also show several important differences between prenatal care and delivery assistance. First, women in all ethnic, education, and geographic groups were less likely to rely on physicians and nurses for delivery assistance than for prenatal care. This result suggests, not surprisingly, that lack of immediate access to biomedical providers—which is more essential close to the time of delivery than for routine prenatal care—may account in part for the relatively low use of physicians and nurses during delivery, even among women who received biomedically-based prenatal care. Secondly, midwives delivered almost two-thirds of all births which occurred in this period, and more than half of all births to women in each ethnic, education, and geographic category in Table 1, except for women with a secondary education and women in urban areas. Midwives were also an important source of prenatal care in most groups, especially for indigenous women. Thirdly, women living furthest from clinics and in remote rural areas were somewhat less likely than women in moderately accessible locations to consult midwives (or any other practitioner), presumably because even midwives were difficult to locate in these areas. A related observation is that a substantial proportion of women living in more remote areas, and non-Spanish speaking indigenous women, received no professional assistance at all during childbirth, but relied on themselves, family members, or neighbours.

⁸ Doctors and nurses comprise a single category in this analysis because they both provide biomedical care in Guatemala, although doctors deliver far more services than nurses.

Table 1
Percentage distributions of number of immunizations and type of pregnancy-related care, by family ethnicity, woman's education, ethnic composition of municipality, distance to clinic and remoteness from Guatemala City

	N ^a	No. of immunizations			N ^b	Prenatal care			Delivery assistance		
		0	1-7	8		None/ other	Mid wife	Dr/ nurse	None/ other	Mid wife	Dr/ nurse
Total	2495	12.1	48.7	39.2	3467	28.3	39.2	32.5	11.1	63.2	25.8
Family ethnicity											
<i>Ladino</i>	1419	7.5	47.3	45.2	2000	27.9	28.3	43.9	10.8	51.2	38.1
Indigenous, Spanish	599	15.5	49.6	34.9	802	21.9	55.4	22.7	4.2	81.6	14.2
Indigenous, no Spanish	477	21.4	51.6	27.0	665	37.3	52.5	10.2	20.0	77.3	2.7
Woman's education											
Secondary +	151	1.3	43.1	55.6	195	5.1	11.3	83.6	0.5	14.9	55.6
Primary educat.	1062	7.2	47.4	45.5	1501	22.9	35.5	41.6	6.1	60.5	33.4
None	1282	17.5	50.4	32.1	1771	35.5	45.3	19.1	16.4	70.8	12.8
Ethnic composition of municipality											
<5% indigenous	427	4.2	41.0	54.8	617	18.6	23.8	57.5	2.6	51.2	46.2
5%–50% indigenous	708	6.8	50.1	43.1	982	30.9	29.9	39.2	10.2	53.0	36.9
³ 50% indigenous	1360	17.4	50.3	32.4	1868	30.2	49.1	20.7	14.3	72.5	13.2
Distance to clinic											
<10 km	1034	8.8	45.6	45.7	1393	23.1	30.3	46.7	1.9	54.5	43.7
10–60 km	1094	15.3	46.8	37.9	1533	25.4	48.1	26.5	9.0	74.1	16.9
³ 60 km	367	12.0	62.9	25.1	541	50.1	36.8	13.1	40.5	54.7	4.8
Remoteness from Guatemala City											
Urban	595	10.6	40.3	49.1	787	21.7	29.7	48.5	6.0	47.4	46.6
Rural, <100 km	997	10.2	49.0	40.8	1415	22.3	45.0	32.7	4.2	72.9	22.9
Rural, ³ 100 km	903	15.2	53.8	31.0	1265	39.2	38.5	22.3	21.9	62.1	16.0

^aDistributions for number of immunizations are based on living children aged 1-4.

^bDistributions for prenatal care and delivery assistance are based on births 0-4 years before the survey.

Multivariate results

As noted in the introduction, ethnicity, social status, remoteness from Guatemala City, and the availability of biomedical health services are likely to be interrelated. For example, the indigenous population is more likely than *ladinos* to be poorly educated, to live in more remote areas, and to have poor access to biomedical health services. We use multivariate logistic regression to determine the strength of the association between each characteristic and the use of childhood immunization and biomedical pregnancy-related services while holding constant other variables shown in Table 1. In addition to the variables presented in Table 1, the estimated models include other social, economic and demographic characteristics which may affect choices about whether or not children should be immunized, and about the nature of prenatal care and delivery assistance. These control variables are age of child at interview, age of mother at interview, birth order of child, mother's work status,

husband's education, husband's occupation, and possession and frequency of watching of television.⁹ The three outcome variables in these analyses are binary: whether or not a child is fully immunized, whether or not a woman received prenatal care from a physician or nurse, and whether or not she was assisted at delivery by a physician or nurse. Thus, no distinction is made in the multivariate analysis between midwives and non-practitioners, and between partial and no immunization.

Odds ratios obtained by exponentiating the respective coefficients in the logistic models are presented in Table 2. Each odds ratio is calculated relative to the omitted category for that variable. For example, the estimated odds ratio of 0.65 in the first column indicates that the odds of receiving a full set of immunizations for an indigenous child in a Spanish-speaking family is roughly two-thirds the corresponding odds for a *ladino* child (the omitted category). The first set of columns presents the odds ratios obtained by the inclusion of a single characteristic (e.g., ethnicity) in the absence of any other variables (equivalent to the observed odds ratios); the second set of columns presents the corresponding odds ratios when all of the specified characteristics as well as the control variables are incorporated into the logistic model.

The results on the left-hand side of Table 2 confirm the pattern noted earlier in Table 1, namely, that the differentials in the use of immunization are smaller (i.e., the odds ratios are closer to one) than those for pregnancy-related care. Nevertheless, with only one exception, each of the odds ratios for the three types of health care is significantly different from unity.

The considerably larger odds ratios on the right-hand side of Table 2 demonstrate that, when all other variables are held constant, the differences in the likelihoods of being fully immunized and of receiving biomedical pregnancy-related care according to ethnicity, education, and location, become much smaller. However, while only one difference for immunization remains statistically significant, large and statistically significant differences for four out of the five variables persist for prenatal care and delivery assistance. These results suggest that family characteristics have a much greater impact on the use of biomedical prenatal care and delivery assistance than on the use of immunization. This finding is supported by additional multivariate results (not shown) which indicate that other family-level characteristics such as the husband's occupation and education are strongly related to a woman's chances of obtaining care from doctors and nurses during pregnancy and delivery, but are only weakly related (if at all) to a child's likelihood of receiving a full course of immunizations (Pebley and Goldman 1992).

Table 2
Estimated odds ratios for logistic regressions^a of the probabilities of receiving full immunization, biomedical prenatal care, and biomedical delivery assistance

	Odds ratios (Bivariate)			Odds ratios (Multivariate ^b)		
	Full immunization	Prenatal care	Delivery assistance	Full immunization	Prenatal care	Delivery assistance
Family ethnicity						
<i>(Ladino)</i>						
Indigenous, Spanish	0.65 ^d	0.38 ^d	0.28 ^d	0.93	0.70 ^e	0.58 ^e
Indigenous, no Spanish	0.45 ^d	0.15 ^d	0.05 ^d	0.94	0.47 ^d	0.23 ^d

⁹ The possession and frequency of watching of television serves as an indicator of the strength of a family's ties with the predominant urban *ladino* culture, as well as of social and economic status.

Woman's education (Secondary+)						
Primary education	0.67 ^e	0.14 ^d	0.09 ^d	1.07	0.41 ^d	0.42 ^d
None	0.38 ^d	0.05 ^d	0.03 ^d	0.81	0.32 ^d	0.28 ^d
Ethnic composition of municipality (<5% indigenous)						
5%-50% indigenous	0.63 ^e	0.47 ^d	0.68	0.76	0.56 ^d	0.92
³ 50% indigenous	0.39 ^d	0.19 ^d	0.18 ^d	0.60 ^e	0.44 ^d	0.49 ^e
Distance to clinic (<10 km)						
10-60 km	0.72 ^e	0.41 ^d	0.26 ^d	0.90	0.66 ^e	0.47 ^d
³ 60 km	0.40 ^d	0.18 ^d	0.07 ^d	0.65	0.41 ^d	0.18 ^d
Remoteness from Guatemala City (Urban)						
Rural, <100 km	0.70 ^e	0.51 ^d	0.34 ^d	0.78	0.86	0.70
Rural, ³ 100 km	0.46 ^d	0.31 ^d	0.22 ^d	0.66	0.88	0.91
No. of children^c	2457	3409	3409	2457	3409	3409

Omitted categories are shown in parentheses.

^aHuber logistic regression which provides robust estimates of the standard errors and takes into account the clustered nature of the sample (Huber 1967).

^bMultivariate models include the five characteristics specified above, along with the following control variables: age of child, age of mother, birth order of child, mother's work status, husband's education, husband's occupation, and possession and frequency of watching of television.

^cThese numbers are slightly smaller than those in Table 1 because children of respondents with no husbands or with missing information on husbands are excluded from the regression analyses. Estimates of prenatal care and delivery assistance are based on births 0-4 years before the survey and estimates of immunization are based on living children ages 1-4.

^dp<0.01

^ep<0.05

Improving pregnancy-related care

The example of Guatemala in the 1980s highlights several important differences between childhood immunization campaigns and pregnancy-related services which public health officials face in moving beyond the typical components of child-survival programs into new areas such as pregnancy-related care. In this section, we draw on the results presented above and on previous research related to medical choice in Guatemala to explore several of these issues.

The first and most obvious point is that, unlike immunization campaigns or programs based on annual or tri-annual household visits, pregnancy-related services (and especially delivery assistance) must be provided by practitioners who are available in or near the community at all times. Despite the efforts of the Guatemalan government and private voluntary organizations to expand health services into rural areas since the early 1970s, the availability of clinic-based services and referral of emergencies to hospitals continues to vary substantially. The significant relationship (in the multivariate model) between the distance of the community from the nearest clinic and the proportion

of women who use physicians or nurses for prenatal care and delivery assistance suggests that variations in service availability have an important effect on the use of these services.

In rural communities, emergency transportation in the case of complicated deliveries to department capitals or to Guatemala City, where most hospitals are located, is expensive and often difficult to arrange. In fact, the following description of a village in predominantly indigenous Huehuetenango in the mid-1980s illustrates the virtual impossibility of obtaining emergency assistance at a government or private facility in some remote rural communities. The description also illustrates geographic differences in availability of immunization and other types of services.

The village has no institutionalized [biomedical] health service. When the village residents need or decide to use this type of service, they go to the [government] Health Post...which is 10 to 12 hours by foot...All persons interviewed or with whom we talked informally indicated the need to have a Health Post in the village or nearby... They indicated that frequently the patient would die on route to the health facility. Transport of a sick adult is very difficult because, if his/her state is serious, (s)he has to be carried in a chair tied on someone else's shoulders. Several men have to make the journey to take turns carrying the sick person on their shoulders.

The only institutionalized health program which has been developed is an immunization program. The Health Technician from the closest Health Post visits the community two times a year to give vaccinations (Villatoro and Hurtado 1986:9-10).¹⁰

While conditions in most rural communities are less extreme, it is often very difficult to reach a health center or hospital sufficiently quickly at the time of delivery, and particularly if complications develop.

Even when clinic-based services are nearby, some facilities may not provide pregnancy-related services, and many have very restricted hours (often limited to daytime and weekdays), short staffing, and limited supplies (Annis 1981; Bossert and Del Cid Peralta 1987; Villatoro and Hurtado 1986). Furthermore, many women report a preference for not delivering in a public hospital because of the poor care they receive (Rosenthal 1987; Vielman and Hurtado, 1986), and the belief that only those referred by private physicians (who must be paid) receive good care.

Several subtler but very important social and cultural issues make the delivery of pregnancy-related services far more complex than childhood immunization programs. The first is that the success of prenatal care and delivery assistance requires much more contact and trust between patient and service provider than immunization. For this reason, social class and ethnic differences between practitioners and patients are likely to be more important barriers to use of biomedical pregnancy-related services than in the case of immunization campaigns. Previous researchers frequently report that poor patients feel that they are not treated in a respectful manner by personnel in clinics. For example, with regard to formal health services, Cosminsky (1987:1169) writes that:

Many of the nurses and doctors act very condescendingly and assume the patient is ignorant. They tend to speak in an authoritarian tone, often scolding the patient... This type of attitude in turn increases people's ambivalence toward the facility and their reluctance to return in the future.

¹⁰ Translated from Spanish. The name of the village itself and the community in which the health post is located have been omitted.

Social barriers between predominantly *ladino* doctors and nurses and indigenous patients are usually even greater, and indigenous patients are sometimes subject to discriminatory behaviour, or overtly deprecating remarks by clinic staff (Rosenthal 1987). Facility staff (as well as private physicians) rarely speak any language other than Spanish, even in predominantly indigenous areas (Annis 1981; Bossert and Del Cid Peralta 1987), making communication with indigenous patients difficult. Thus, the indigenous population often perceives health facilities to be primarily *ladino* institutions (Tedlock 1992).

A more salient issue in the case of pregnancy-related care than immunization is that women and their families often have a choice both about whether to seek professional pregnancy-related care, and about which type of practitioner (midwife, government or private voluntary clinic, or private physician) to use.¹¹ Immunization is usually available only from government or private clinics. Even though immunization may make less sense in the context of traditional health beliefs than pregnancy-related care, parents may have relatively little choice about whether their children are vaccinated. The reason is that in immunization campaigns, village leaders or clinic personnel frequently assemble children in a central location for immunization, often with only tacit agreement (instead of active participation) of parents.¹² Similarly, during house-to-house visits during immunization programs, parents may find it difficult to refuse to have their children immunized.

On the other hand, in the case of prenatal care and assistance at childbirth, the mother or another family member must actively seek assistance. Traditional midwives provide an alternative source¹³ of prenatal care and delivery assistance to both *ladino* and indigenous women and they generally live within the community in which they practise. Physicians and other biomedically-trained personnel may be less acceptable to pregnant women because their practices do not conform with women's own beliefs about pregnancy and childbirth, they do not explain procedures and treatments in the context of these beliefs, and they are often community outsiders without any social ties to a local woman and her family (Quezada et al. 1988). For example, Tedlock (1992:38) reports that in a predominantly indigenous community:

Several indigenous midwives have received training in Western procedures for child delivery in a hospital in Huehuetenango, but...because they are rarely initiated curers¹⁴ they have few patients. It is the initiated indigenous Quich'Ꞥ midwives (*iyom*) who deliver most of the babies.

Vielman and Hurtado (1986:54) were told by their predominantly *ladino* respondents that many women prefer the traditional midwife because the doctor at the local clinic did not use massage (a traditional method of prenatal care and diagnosis) during prenatal visits. Furthermore, biomedical practice usually requires that a pregnant woman undress, at least partly, and undergo a pelvic examination, often by a male doctor, a practice which violates strong traditional standards of modesty

¹¹ In the case of private physicians, however, this choice may be constrained by lack of financial resources.

¹² In fact, in some areas, the Guatemalan Army actively participated in early regional immunization campaigns and in the 1986 national campaign. Their role was usually transport, but as Rosenthal (1987:71-72) reports, soldiers' responsibilities were sometimes more extensive: 'People still recount with horror and indignation how a few years before my first visit the army had been sent to force people to vaccinate their children. Previously, those who did not want their children vaccinated would hide them when the health post nurses came to their home. The soldiers, however, went into the houses and forcefully took the children out'.

¹³ Of course, in many remote locations, traditional midwives are the only readily available source of care.

¹⁴ That is, they did not enter the practice of midwifery through traditional forms of recruitment and training.

for women. Undressing is also thought by some patients to upset the hot-cold balance, and thus cause illness (Logan 1973; Hurtado and Esquivel 1986; Tedlock 1987). Women often report preferences for traditional midwives because they provide treatment while patients are clothed (Vielman and Hurtado 1986; Cosminsky 1987).¹⁵

The MSPAS has made a number of efforts to encourage women to visit health posts and centres for prenatal care visits. For example, midwives are required to register with the local health post and to bring their patients in for prenatal examinations (Hurtado and Esquivel 1986); compliance has varied considerably over the past several years by place, time period, and patients' preferences. A popular program in poor rural areas has been the distribution of food supplements to pregnant women and mothers with small children. Pregnant women are frequently required to participate in prenatal care in order to qualify for their food supplementation programs. However, Cosminsky (personal communication, 1992) suggests that women may visit the post or centre for prenatal care as a means of obtaining supplemental food, but may actually seek advice about their pregnancy and care from a local midwife in whom they have greater trust.

Because of the difficulty in expansion and improvement of clinic-based facilities, the high cost of private physicians' fees for most families, the frequent social barriers between physicians and patients, and the continuing importance of traditional health beliefs and traditional midwives, short-run improvements in pregnancy-related care for Guatemalan women are most likely to be achieved through a concerted effort to train and provide institutional support to traditional midwives rather than through efforts to expand physician and clinic-based pregnancy-related services. This situation is hardly limited to Guatemala (see WHO 1987; Isenalumbe 1990; Kwast 1991). For example, in neighbouring Mexico, Parra (1991) concludes that despite large investments and a major focus on extension of health services into rural areas, rural women and particularly poorer women continue to rely heavily on midwives.

In Guatemala, this reality has been recognized by agencies such as UNICEF which provided training kits and financial support to the Guatemalan government midwife training programs during the 1980s (Bossert and Del Cid Peralta 1987), and by the government itself in its current five year plan (SEGEPLAN 1991). However, the experience of midwife training in Guatemala (Cosminsky 1982) and Mexico (Jordan 1989; Parra 1991) suggests that standard methods of training traditional midwives in biomedical techniques have often been seriously inadequate and require considerable rethinking. Jordan (1989), for example, indicates that training programs generally rely on methods of classroom instruction (e.g., slide shows, schematic diagrams and verbal descriptions rather than hands-on apprenticeship-style instruction) that are alien to students, that the subject matter may not fit the practical realities facing midwives in practice, and that the form and content of instruction often denigrate years of practical knowledge that midwives have and denigrate all traditional methods, regardless of their merits. The barriers between instructors and midwives in Guatemala are sometimes further increased by the fact that the instruction is carried out in Spanish, or translated from Spanish as the class proceeds.

Our results also suggest that there were a substantial number of women living in relatively remote areas in 1987 who appear to have had inadequate access both to health posts and centres, and to traditional midwives. Providing pregnancy-related services to these women will be an even greater challenge.

¹⁵ The importance of female modesty is illustrated by Vielman and Hurtado's (1986:55) report that 'some informants specified that it embarrassed them for the midwife to see them [at the time of delivery] in this state (yelling, struggling, and with their "private parts" showing) and therefore they preferred to give birth alone'.

Conclusions

The worldwide experience of primary health-care programs suggests that the equitable provision of clinic-based services in many poor countries is likely to involve operational, social, and cultural issues that are different and more complex than those faced in immunization programs. For this reason, we anticipated that immunization services would reach a broader cross-section of the Guatemalan population than pregnancy-related services, even though immunization itself may be less compatible with traditional health beliefs than maternity care.

The results presented in this paper support this hypothesis. Specifically, estimates derived from a 1987 national survey indicate, first, that immunization is more likely to be used by hard-to-reach segments of the population, including those living in remote areas and at a distance from health facilities, the indigenous population, and poorly educated mothers; and secondly, that immunization is less strongly related to social, economic, ethnic, and geographic factors than is the use of physicians or nurses during pregnancy and delivery.

The comparison between childhood immunization programs and biomedical pregnancy-related services in Guatemala serves as an example of the challenges that public-health officials face in moving beyond child-survival programs into other areas of maternal and child health care in poor countries. Aside from the apparent organizational and financial differences, the equitable provision of pregnancy-related care poses social and cultural issues which are more complex than those faced in immunization campaigns and similar programs. Providing appropriate training for traditional midwives appears to be the first step in improving maternity services in many poor countries, but there must be adequate, ongoing institutional support and systems of referral.

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