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Familiar*

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**Pregnancy Care in Rural Guatemala:
Results from the Encuesta Guatemalteca de Salud Familiar**

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I. INTRODUCTION

Nearly 600,000 women die each year due to pregnancy-related causes. Over 99 percent of these women live in developing countries (WHO and UNICEF, 1996). An additional 50 million women in developing countries experience a pregnancy-related complication each year (NRC, 1997). These numbers reflect huge differences in maternal morbidity and mortality between developing and industrialized countries, with rates in the former countries reaching values 100 times as large as those in the latter (Walsh et al., 1993).

Leedham (1985) estimates that between 60 and 80 percent of births in developing countries are attended by midwives or traditional birth attendants, who are frequently the primary or sole providers of maternal health care (Levitt and Minden, 1995). More recent estimates indicate that about half of births in the developing world are attended by a person with no formal or professional training (WHO, 1997). Most women in these countries do not have access to and cannot afford obstetrical care.

The purpose of this report is to describe and evaluate pregnancy-related care in Guatemala. Guatemala has among the highest maternal and infant mortality rates in Latin America. According to the most recent estimates, the infant mortality rate in Guatemala is 43 deaths per 1,000 live births and the maternal mortality rate is 190 deaths per 100,000 live births (World Bank, 1999). Postpartum hemorrhage is the most common cause of maternal mortality (24%), followed by retained placenta (15%) and septicemia (11%) (OPS-OMS, forthcoming). Rates are even higher in the rural areas, where the majority of the population lives. For example, estimates from the 1996 Demographic Health Survey reveal an infant mortality rate of 56 per 1000 in rural areas compared to only 41 per 1000 in urban areas, for the first half of the 1990s (INE et al., 1996).

In an effort to reduce infant and maternal deaths and disabilities, Guatemala – along with many other developing countries – has promoted training programs for traditional birth attendants, more commonly referred to as midwives (*comadronas*), and their integration with the formal health system. The government of Guatemala has had formal association with midwives for decades, having introduced licensing arrangements for midwives as early as 1935 and having initiated training programs in 1955. During the 1980s that the Guatemalan Ministry of Health adopted recommendations of the World Health Organization toward the formal recognition of midwives and their integration into the national health care system (Acevedo and Hurtado, 1997; Leedam, 1985).

A report in the late 1980s (Putney and Smith, 1989) indicates that about 70 percent of the approximately 20,000 midwives in Guatemala received training, a statistic that suggests that the training programs have been widespread. On the other hand, there has been frequent criticism of the quality of the midwife training programs in Guatemala (Cosminsky, 1982; Greenberg, 1982; Putney and Smith, 1989; Lang and Elkin, 1997). In addition, in spite of increased use of government health services and private doctors and nurses, utilization of these biomedical services for pregnancy-related care in Guatemala continues to be low relative to other Latin American countries. Midwives remain the

major provider of pregnancy and delivery care, especially in rural areas and among the indigenous (INE et al., 1996; Pebley et al., 1996).

The objective of this report is to use a large-scale survey of maternal and child health in rural Guatemala to describe many diverse aspects of care during and after pregnancy. One important part of this goal is to examine the extent to which midwives have been effectively integrated with biomedical health providers and facilities. A related aim is to assess the quality of care offered by Guatemalan midwives. The data presented in this report are based on a study of maternal and child health in rural Guatemala, known as the *Encuesta Guatemalteca de Salud Familiar* (EGSF), which was designed to investigate children's illnesses, problems experienced by women during pregnancy, and the use of health services. As described in more detail below, these data include interviews with women about their recent pregnancies and interviews with both traditional and biomedical providers that offer care during pregnancy.

II. RESULTADOS

1. The Encuesta Guatemalteca de Salud Familiar (EGSF): Survey Design and Characteristics of Families and Communities

Survey Design

The EGSF was carried out between May and October, 1995, in 60 rural communities located in four departments: Chimaltenango, Jalapa, Suchitepéquez, and Totonicapán (see Figure 1.1). These departments were selected in order to include diversity in ethnicity and language and in social and economic background. The sample for this survey was selected in two stages. In the first stage, 15 communities were chosen randomly from each of the four departments, yielding a total of 60 communities. Only relatively small rural communities – defined as having between 100 and 1800 households – were included in the study and the few indigenous communities (Poqomam) in Jalapa were excluded from the sampling frame. Communities were selected with probability proportion to population size to yield self-weighting samples within each department. However, the sample is *not* self-weighting across departments – i.e., the sample sizes in the EGSF are approximately equal across the four departments, whereas the actual size of the rural population varies considerably by department.¹

In the second stage of selecting the sample, 100 households were chosen randomly from each of the 60 communities. Among these households, a total of 4,787 completed a household roster; most of the nonresponse resulted from unoccupied structures. All women within the age range of 18 to 35 living in these households were identified and asked to participate in the individual interview. The total sample consists of 2,872 women ages 18-35, comprising about 50 women in each of the 60 communities. The overall response rate of the survey was 89 percent. Additional details of the sampling plan are provided in Appendix I and in Peterson et al. (1997).

The individual interviews were conducted in Spanish, K'iche', and Kaqchikel, depending on the language preferred by the respondent. The interviews covered a wide range of topics, including the respondent's background, maternal and child health, the family's social and economic background, and women's health beliefs. The average length of the interview was 74 minutes. Table 1.1 provides a summary of the information contained in the individual questionnaire.

In addition to individual women, community informants and providers were interviewed in each community. Three community informants (the mayor, a woman in a leadership position, and another person not in a leadership position but who knew the community well) provided information about the community and a listing of health

¹ Because the sample is not self-weighting across departments, means and proportions based on the total sample do not represent any specific population. Weighted estimates can be obtained based on the approximate population sizes for rural communities in the four departments (see Peterson et al., 1997, p. 7). Estimates for a given department do not need to be weighted. They are representative of the rural population (defined as communities containing between 100 and 1800 households) in the given department.

providers and facilities within 20 kilometers of the community. These listings were consolidated to construct a census of health providers and facilities for each community.

Based on the census of health providers and facilities, five types of providers were randomly selected from each community and interviewed: the person in charge of the health center or post nearest the community (or another staff person if the head was not available), a private doctor, a midwife, and two other providers, including non-biomedical practitioners, such as curers, herbalists, spiritists, and others. Three different questionnaires were used for these interviews, depending on the type of provider: (1) private doctors;² (2) staff of the health post or center; and (3) midwives and other providers. The last of these questionnaires contains separate sections for providers who take care of pregnant women and for those who offer other forms of treatment. The community and provider questionnaires were administered only in Spanish. Table 1.2 provides a summary of the information collected from each type of questionnaire included in the EGSF, along with the total sample sizes of respondents.³

Data on Pregnancy Care

Most of the information presented in this report is derived from interviews with individual women and with providers (doctors, personnel at health posts and centers, and midwives). Estimates of access to providers and characteristics of the communities are based on the key informant interviews.⁴

The information from individual women comes from mothers who had a live birth between January, 1990, and the date of their interview in 1995. These women were asked a series of questions about prenatal care and assistance at delivery for the two most recent births that occurred between 1990 and 1995. In total, these data were collected for 3,350 births to 2,020 women. For each birth, mothers were asked about complications experienced and providers seen during each month of pregnancy and the answers were recorded in a calendar-type table (shown in Appendix II). In addition, for each provider that the mother mentioned, she was asked why she saw the provider, how many times during pregnancy she visited him or her, and whether the provider performed each of several specific procedures or administered treatments. Finally, the mother was asked a series of questions pertaining to delivery and the postpartum period (the 40 days after birth). The complete questionnaires used for the individual interviews, along with those for the key informant and provider interviews, can be found in Pebley and Goldman (1997).⁵

² When we refer to doctors in this manuscript, we mean private doctors unless stated otherwise.

³ This study also included a set of qualitative interviews and focus groups, which were fielded in four rural communities in 1994. However, this report is based only on data from the EGSF. Findings from the qualitative interviews can be found in the following articles: Acevedo and Hurtado, 1997; Pebley et al., 1999; Carter, 1999.

⁴ Estimates based on interviews with the key informants are derived by averaging the responses from the three informants in each community, for quantitative responses, or by selecting the most frequent or plausible responses, for qualitative answers.

⁵ Information about how to obtain the EGSF data sets and related documentation is available on the following website: <http://www.rand.org/FLS/EGSF/>.

Characteristics of Families and Communities in the Sample

Table 1.3 presents some characteristics of the 2,020 women who had a least one live birth since January, 1990, and their families, by department. As shown at the top of Table 1.3, ethnicity and language are strongly associated with department. For example, nearly three-quarters of all ladina⁶ mothers in the sample live in Jalapa.⁷ In Suchitepéquez, about one-quarter of mothers are ladina and the remainder are indigenous (Kaqchikel), nearly all of whom can speak Spanish. Nearly all indigenous (Kaqchikel) mothers in Chimaltenango can speak Spanish, compared to just over half of indigenous mothers (K'iche') in Totonicapán.

On average, the women have little formal education (2.3 years) and only 58% can read a newspaper. Estimates based on reported activities in the two weeks prior to the interview indicate that about two-thirds of mothers (65 percent) are not employed in the paid labor force. Only 4 percent of the women are covered by some form of health insurance.⁸

Indigenous spouses or companions of the mothers are more likely to speak Spanish than indigenous mothers themselves. On average, the men have one more year of education than do their wives or companions. Over half of the men work in agriculture.

Families in these areas have few resources. In the EGSF, women were asked to report on 40 staples and food products that household members bought, harvested, produced, or gathered in the seven days preceding the survey. From these data, Gragnolati (1998) developed a measure of per capita monthly household consumption. Consumption is a better indicator of overall resources than income because it is less subject to short-term fluctuations and is likely to be more accurate, especially in agricultural communities where food may be produced and consumed within the household (Deaton, 1989; Montgomery et al., 2000). Among families in the EGSF sample, consumption is very low on average, approximately 23 quetzales per person in the household per month.⁹ Despite the importance of agriculture, few families own five or more hectares (7.14 manzanas) of land, defined by agrarian law in neighboring Honduras as the minimum amount of potentially irrigable land on which a family can subsist (Valverde et al., 1977). The majority of families live in homes with dirt floors and fewer than 10% have an inside toilet. Only about half have running water and electricity, only a few own a car or truck, and virtually none have a telephone.

⁶ Ladina is the term used in Guatemala to refer to the non-indigenous population, those of mixed or European origins.

⁷ In the department of Jalapa, respondents were not asked their ethnicity because the question was considered offensive; all respondents in Jalapa were coded as ladina.

⁸ In total, 12 percent of women report that they or their families have IGSS or some other form of health insurance. However, only one-third of these women are themselves covered by the insurance.

⁹ This measure excludes less frequent expenses such as cosmetics, transportation, clothing, medical costs, and celebrations.

The description of the 60 communities in the sample, shown in Table 1.4, reveals that communities in Totonicapán are more remote, on average, than the other communities, as determined by distance to the capital and access to public transportation. Most communities have piped water, but only one-quarter have a sewer system. A series of questions was asked of the key informants regarding the proportion of families in the community that are involved in specific economic activities. The responses indicate that, in almost all of the communities, more than half of the families are involved in farming. Many families in Suchitepequéz work on plantations and, in about one-quarter of communities in Chimaltenango and Totonicapán, more than half of the families produce food or handicrafts for sale. Responses to questions about the frequency of migration of community residents indicate that migration to plantations or to other parts of Guatemala is common in about 30 percent of communities. In addition, in 23 percent of the communities, residents frequently migrate to other countries (primarily to the United States) and in 39 percent of communities it is common for families to receive remittances from abroad.

2. Providers and Facilities

Health Care System

The health care system in Guatemala has frequently been characterized as *pluralistic*, because of the coexistence and concurrent use of traditional, biomedical and popular practitioners (Cosminsky and Scrimshaw, 1980; Pebley et al., 1996). In recent years, the distinction among these types of providers has become blurred in Guatemala, a trend occurring throughout the developing world, as traditional practitioners adopt biomedical practices and rely on Western pharmaceuticals.

Pregnancy-related care in Guatemala is most commonly provided by midwives, who are generally highly respected within their communities. Since pre-Hispanic times, midwives have offered women care during pregnancy, delivery and the postpartum period. However, Guatemalan women have been increasingly seeking biomedical care, often while continuing to visit the midwife. Biomedical care consists of services from government-supported health centers or posts,¹⁰ which provide care for free or at a nominal cost through the Ministerio de Salud Pública y Asistencia Social (MSPAS). The most recent estimates indicate that there are 857 health posts and 254 health centers in Guatemala (MSPAS, 1999). In addition, the MSPAS recruits and trains volunteer health workers in the community, known as health promoters. Biomedical care can also be obtained from private doctors and occasionally professional nurses. Doctors, and especially hospitals, tend to be concentrated in urban areas. Whereas government-run hospitals provide delivery services without cost, private hospitals tend to be very expensive. About 17 percent of Guatemalans are covered by IGSS (*Instituto Guatemalteco Seguro Social*), an insurance program which operates its own clinics and is paid for by the government and large employers (PAHO, 1998). Overall, Guatemala has the institutional capacity to provide formal medical services for only 20 percent of birthing women (Schieber and Delgado, 1993).

Midwife Training Programs

Training programs for midwives in Guatemala began in 1955 and they have been modified several times since that date. Midwives who have not received training are legally prohibited from practicing (Cosminsky, forthcoming; Greenberg, 1982), although untrained midwives continue to do so (Hurtado and Saenz de Tejada, forthcoming). The current training program carried out by the Ministry of Health lasts for 15 days (eight

¹⁰ Health centers are located in municipal capitals, are typically directed by a doctor, and sometimes have in-patient facilities. In contrast, health posts are located in small communities, are usually managed by an auxiliary nurse, rural health technician, or medical student, and offer fairly limited services. In contrast to professional nurses who have university degrees, auxiliary nurses have little training – typically about 8 to 10 months of training subsequent to nine years of primary school. Health centers and posts normally do not offer delivery care.

hours per day) and is taught by a nurse with at least one-year of nursing education.¹¹ Training programs are designed to teach midwives about general hygiene and basic maternity care, to encourage midwives to send all pregnant women to the health center or post for tetanus vaccination, prenatal examinations, and postpartum follow-up, and to instruct midwives to recognize and refer high-risk women and those with complications to a doctor or hospital (Cosminsky, 1977; Putney and Smith, 1989). As part of these efforts, training programs frequently condemn traditional practices (such as use of the sweatbath, massage, and herbal remedies) and may encourage the adoption of biomedical ones in their place (Cosminsky, 1982; Greenberg, 1982; Putney and Smith, 1989). Additional training may be available for midwives who have already received the basic course: monthly meetings at the health center and a three-day retraining course subject to available funding (Lang and Elkin, 1997). Besides training offered by the Ministry of Health, non-governmental and international agencies have also conducted training programs.

Many criticisms have been targeted at the midwife training programs (Cosminsky, 1982; Greenberg, 1982; Putney and Smith, 1989; Lang and Elkin, 1997). The programs have been considered didactic, tedious, unnecessarily complicated, and inappropriate for older, frequently illiterate, rural women. In addition, the nurses teaching the material are often considered inadequately trained themselves, are typically unable to speak indigenous languages, and are frequently condescending to the midwives. Observers of these programs also criticize the training programs' reliance on Western, urban models of training that (1) use culturally inappropriate teaching methods; (2) advocate the use of procedures that are impractical in the midwives' environment, particularly for home deliveries (e.g., sterilization of scissors via boiling); and (3) discourage, or sometimes condemn, traditional practices that are unlikely to have negative effects and may well have beneficial ones (e.g., delivery in an upright rather than supine position and cauterization of the umbilical cord in lieu of sterilization of scissors). The effectiveness of the retraining sessions has also been brought into question (Putney and Smith, 1989).

Availability and Cost of Providers

In Table 2.1, we present estimates of the availability of traditional and biomedical services related to pregnancy care, based on the 60 communities included in the EGSF. These results are based on information given by the key informants about the presence of different types of providers and facilities in the community or within 20 kilometers of the community, and on the time that it takes to travel to the provider from the center of the community.¹² The findings indicate that all communities have a midwife nearby and virtually all have one within the community itself. On the other hand, biomedical services are far less accessible. For example, only about 40 percent of communities have a health

¹¹ Although professional nurses are officially responsible for training, most training has been the responsibility of auxiliary nurses who have little experience in delivery (Hurtado and Saenz de Tejada, forthcoming).

¹² Travel time was determined by (1) selecting the least expensive type of transport reported among the key informants in each community (e.g., foot or bus); and (2) averaging the reported travel times for that type of transport in each community.

center or post¹³ and about one-fifth have a private physician that serves pregnant women. Only about half of the communities have a private doctor within an hour's travel time. Hospitals are even more inaccessible: for example, only about one quarter of communities have a public hospital within one hour of travel time. Overall, nearly half of the communities do not have a single biomedical provider or facility.¹⁴

Estimates by department indicate substantial variation in the availability of biomedical providers or facilities across departments. For example, communities in Totonicapán are the least likely to have doctors within or nearby the community. Access to health centers or posts is best in Chimaltenango.

Figure 2.1 shows the distribution of the 60 communities according to the combination of providers located within the community. About half of the communities have only a midwife and two percent (one community) have no provider. On the other hand, 22 percent of communities have a midwife, a doctor, and a health post or center.

Table 2.2 presents the average costs associated with pregnancy and delivery care and the types of payment accepted. These data are based on interviews with doctors and midwives. The results show clearly that the costs vary enormously, with charges for several prenatal visits and delivery care being about ten times as high for doctors as compared with midwives. The average charge for a delivery by a doctor (350 quetzales) is more than twice as large as the average monthly household consumption (140 quetzales, Table 1.3). The data in Table 2.2 also indicate that more than three-quarters of midwives accept payment in kind for patients who do not have money, and more than half of private doctors do not charge these patients.

Characteristics of Providers

Tables 2.3, 2.4, and 2.5 present characteristics of midwives, health centers and posts, and private doctors that treat pregnant women. This information is derived from questions in the provider interviews pertaining to characteristics of the providers and their facilities. Only the estimates in Table 2.3, which refer to midwives, are shown separately by department because of the relatively small sample sizes of health centers, health posts, and private doctors.

As shown in Table 2.3, almost all of the 66 midwives in the EGSF sample are female, and, except in Jalapa (where providers were not asked about their ethnicity, but simply assumed to be ladina), most are indigenous. Less than one-third of midwives received any schooling; schooling is especially uncommon among midwives in Jalapa and Totonicapán. In all departments except Jalapa, a much higher proportion of midwives entered this profession by experience or through divine calling than through formal training or apprenticeship. Nevertheless, the majority of midwives in each department reported that they attended a training course specifically related to pregnancy

¹³ We do not present separate estimates for health centers and health posts because some of the key informants apparently identified these facilities incorrectly.

¹⁴ This estimate excludes pharmacies because pharmacies offer little in terms of pregnancy care.

and delivery care. Overall, 76 percent of the midwives attended such a training course; these midwives will be referred to as "trained midwives" in subsequent parts of this document.¹⁵ As noted earlier, the current training program carried out by the Ministry of Health lasts for 15 days, eight hours per day. The nature of the training programs and differences between trained and untrained midwives will be discussed in greater detail in Sections 5 and 7 of this report.

As suggested by earlier ethnographic studies, these data indicate that midwives often fulfill several roles. Overall, 35 percent of midwives report that, in addition to caring for pregnant women, they also treat sick patients; the proportion is considerably higher in Jalapa and lower in Totonicapán. The data suggest that the midwife's work is generally not full-time: for example, during the week prior to the survey, midwives spent about 10 hours on average treating pregnant women or sick patients. On average, the midwives report that they attend one birth a week (i.e., 2.2 births every two weeks); most of the midwives' clients are non-relatives. About half of the midwives (52 percent) go to their clients' homes. Among midwives who receive clients in their own homes, slightly more than half have separate rooms in their homes to treat patients; about the same proportions have electricity and have safe water in their homes.

Table 2.4 presents characteristics of the 48 health centers and posts in the survey.¹⁶ In 38 of these facilities, the respondent in the survey was the person in charge of the post or center. Not surprisingly, there are many striking differences between the 23 health posts and the 25 health centers in the sample. Most of the health posts have relatively small staffs, sometimes consisting of only one person. About half have no professional employees (i.e., a doctor, medical student, or professional nurse) and are typically staffed by an auxiliary nurse and/or a rural health technician. In contrast, most of the health centers have at least 10 people on the staff, including a doctor and a professional nurse, and about one-quarter have inpatient facilities.

The data reveal that more than half of the respondents (usually the person in charge of the health facility) are female. About 60 percent of the facilities outside Jalapa report that at least one employee speaks an indigenous language. However, most of these employees are auxiliary staff rather than professionals: none of the professional staff at health posts and fewer than one-third at health centers speak an indigenous language. Only one of the facilities in this sample reports any charge for prenatal care (and the charge is only 25 centavos), while no facility reports charges for delivery care.

The data in Table 2.4 also indicate that most of the health centers and posts in the sample have basic equipment on hand, such as a regular stethoscope, blood pressure cuff, autoclave, scales, thermometer, vaginal speculum, antiseptic, and gloves. Yet, many lack

¹⁵ In the individual interviews, women who reported seeing a midwife were probed as to whether the midwife was trained – i.e., whether the midwife was a "comadrona empirica" or a "comadrona adiestrada." Mothers' responses (based on 2,829 births) yield an estimate of 94 percent of midwives trained. However, this estimate is likely to be unreliable because many women may not know the status of their midwife or may want to believe (or report to the interviewer) that their midwife is trained.

¹⁶ There were five communities in the EGSF in which no health center or post within 20 km was interviewed. The remaining 55 communities were served by the 48 facilities in the sample.

a fetal stethoscope. Moreover, while most have delivery instruments, they often lack a microscope and equipment for transfusions. Most of the facilities have a regular supply of antibiotics and analgesics, but only about half have iron supplements and only one-third have folic acid supplements consistently in stock. Given the importance of iron and folate supplements for poorly nourished pregnant women, the lack of a reliable supply may have important consequences for maternal and child health. About half of all facilities have a pharmacy, but none of the posts and only about half of centers have a laboratory. Health centers are more likely than posts to be equipped with electricity and piped water.

All but one of the 27 private doctors interviewed offer prenatal or maternity care. Table 2.5 is restricted to these 26 doctors. Forty-six percent of these doctors reside in Jalapa, a finding which needs to be kept in mind when interpreting estimates from the sample of doctors. In contrast to the staff of health centers, almost all of these private doctors are male. About half of doctors outside of Jalapa are able to speak an indigenous language. The doctors work with very few staff persons, rarely more than a nurse and secretary. Most of the doctors have basic equipment and supplies, but they often lack specialized equipment such as equipment for transfusions. It is important to recognize that although about one-third of doctors have medicines or vitamins in stock, almost all of the doctors charge the patients for them. Thus, rather than pay the high fees for an office visit, many Guatemalans go directly to the pharmacy for treatment (Hurtado and Esquivel, 1986).

3. Patterns of Care During Pregnancy, Delivery and the Postpartum Period

In the individual interviews, women were asked detailed questions about prenatal care and assistance at delivery for the two most recent births that occurred since January, 1990. This information allows us to determine the type of care that women received during and after pregnancy, the timing of their visits, and the frequency of visits to different types of providers.

Type of Care during Pregnancy, Delivery, and the Postpartum Period

Table 3.1 presents distributions of the type of care women received during pregnancy, delivery, and the postpartum period. The data reveal that almost all women in the EGSF sample obtained some form of care during pregnancy – i.e., only four percent sought no provider during this time. As suggested by earlier research, the midwife is the most frequently sought provider at all stages of a pregnancy and birth, and most deliveries occur at home.¹⁷

There is some variation by department. For example, pregnant women in Totonicapán are the most likely to rely on the midwife for care during pregnancy and to deliver at home. In all four departments, biomedical care during pregnancy is most commonly sought together with a midwife rather than on its own. For 28 percent of pregnancies in the overall sample,¹⁸ women visited both the midwife and some form of biomedical provider during pregnancy – most often a government health center or post – and in 11 percent of pregnancies, they used only a biomedical provider.¹⁹ Again, these estimates vary by department, with women in Jalapa using biomedical care more frequently than elsewhere and women in Totonicapán being the least likely to do so. Although biomedical care during pregnancy has become more common over time (INCAP et al., 1989; INE et al., 1996), the majority of pregnant women in each department except Jalapa relied on only the midwife for pregnancy and delivery. Thus, it seems that many women receiving care from a midwife in Guatemala either are not told to seek biomedical care or they fail to heed the recommendation when offered.

Table 3.2 presents patterns of care during pregnancy and birth by the ethnicity and language of the mother. These estimates indicate enormous variation across the ethnic groups. For example, whereas fewer than 40 percent of ladinas relied only on the midwife during pregnancy, more than 80 percent of indigenous non-Spanish speaking women did so. Ladinas were more likely than indigenous women – especially those speaking only indigenous languages – to use biomedical care, either in combination with

¹⁷ Most births that occurred at home were attended by a midwife (95 percent); nurses and staff at health centers and posts occasionally attended home births.

¹⁸ This value (28 percent) is the sum of the proportions seeing a midwife and health center or post (18.6 percent), a midwife and doctor (7.8 percent), and a midwife, health center or post, and a doctor (1.7 percent).

¹⁹ This value (11 percent) is the sum of the proportions seeing only a health center or post (5.3 percent), only a doctor (5.5 percent), and both a health center or post and a doctor (0.6 percent).

a midwife or alone. For example, whereas almost one-quarter of *ladinas* relied solely on biomedical facilities or doctors for care during pregnancy, only about seven percent of Spanish-speaking indigenous women did so and *not even one* indigenous non-Spanish-speaking woman did so.²⁰ *Ladinas* were also more likely than indigenous women to give birth at a medical facility.

A recent study based on the EGSF explored how the use of biomedical pregnancy-related care varies by ethnicity, socioeconomic status, social and cultural variables, and access to biomedical health facilities (Glei and Goldman, 2000). Social and cultural variables included the health beliefs of the woman, a measure of the extent to which the woman makes decisions in the household on her own, and the woman's social connections to large cities or places outside Guatemala. The results confirm the ethnic patterns noted above in the use of biomedical pregnancy care. Specifically, the more traditional the group of indigenous women, as measured in this case by both language spoken and the wearing of indigenous clothing, the more likely the women are to rely on a midwife and the less likely to use biomedical care. The findings from this paper also show that social and cultural variables are more strongly associated with the use of biomedical pregnancy care than are measures of access to providers. Moreover, the social and cultural variables are more important than are measures of access in accounting for the lower use of biomedical services by indigenous women. Other factors that are strongly related to use of a biomedical provider during pregnancy or delivery are the mother's education, birth order, and complications during previous pregnancies.²¹

The lower panels of Tables 3.1 and 3.2 present estimates pertaining to care of the mother and the infant during the postpartum period (the 40 days following the birth), by department and by ethnicity, respectively. The data indicate that, during this time, most women relied solely on the midwife. Moreover, a substantial fraction (29 percent for the entire sample) saw no provider at all. This proportion ranged from about one-sixth of women in Chimaltenango to almost half of women in Totonicapán not seeing a provider during the postpartum period. Except in Jalapa, relatively few women saw a biomedical provider, and most of the women who did so saw only a doctor. Not surprisingly, postpartum use of biomedical providers was lowest in Totonicapán. Estimates by ethnicity (Table 3.2) indicate that the prevalence of postpartum care is lowest among non-Spanish-speaking indigenous women, with about 40 percent seeing no provider and almost none using any type of biomedical care during this time.²²

²⁰ These values represent the sum of the proportions seeing only a health center or post, only a doctor, and both a health center or post and a doctor. For *ladinas*, this value is 11.0+10.6+1.3 or 22.9 percent and for Spanish-speaking indigenous women, the value is 3.0+3.6+0.3 or 6.9 percent.

²¹ With regard to the social and cultural variables, women with biomedical health beliefs, women with greater autonomy in household decision making, women with relatives in Guatemala City or abroad, and women living in communities experiencing frequent migration abroad were more likely to see biomedical providers than their counterparts. In addition, women with more years of schooling, women having their first birth, and women who had experienced a fetal loss or had a prior Cesarean delivery were more likely to see a biomedical provider than their counterparts. This analysis was restricted to women who saw some type of provider during pregnancy (Glei and Goldman, 2000).

²² According to the data in Table 3.2, 40.9 percent of non-Spanish-speaking indigenous mothers reported that they saw no provider during the postpartum period to check on their own health and 41.4 percent reported that no provider checked on the health of their newborn. These mothers reported that 2.9 percent

Frequency and Timing of Care

As shown in Table 3.3, more than half of the women made their initial prenatal visit to a provider during the first four months of pregnancy, as recommended by WHO (WHO, 1994). The proportions making these early visits are considerably higher in Jalapa and Suchitepéquez than in Chimaltenango or Totonicapán, and much higher among ladinas than indigenous women. Relatively few women – 7.5 percent of those who saw a provider – waited until the last two months of pregnancy to see a provider. However, women living in Totonicapán and indigenous women who do not speak Spanish were considerably more likely than other women to make their first prenatal visit late in pregnancy.

On average, pregnant women in the sample visited a provider about eight times (7.8) during the pregnancy. About two-thirds of the women visited a provider between four and ten times during the pregnancy. These frequencies are relatively constant across the four departments in the sample and across the ethnic groups. For example, the average number of prenatal visits ranged from 7.1 in Totonicapán to 8.5 in Chimaltenango, and from 7.4 among non-Spanish speaking indigenous women to 8.0 among ladinas.

Table 3.4 presents additional information on the timing and frequency of visits to providers during pregnancy. In this table, the estimates are shown by the combination of types of providers visited: only a midwife, a midwife in combination with a biomedical provider (health center, health post, or doctor), and only a biomedical provider (health center, health post, or doctor, or some combination of these). The data reveal that women who sought a biomedical provider (particularly doctors) did so much earlier, on average, than those who visited only a midwife. For example, about three-quarters of women (77.6 percent) visiting only a doctor (or nurse)²³ received care during the first four months of pregnancy, in contrast to only 40 percent of those visiting solely a midwife. First visits to health centers or posts occurred later than first visits to doctors but earlier than those to midwives.

The data in the second panel of Table 3.4 refute earlier research indicating that women who visit a government facility or a doctor during pregnancy, in addition to a midwife, typically do so only once. For example, our results demonstrate that, for pregnancies in which women combined care from a midwife and a health center or post, women visited the latter 4.5 times on average. This value is smaller than the 6.4 visits made on average to the midwife but considerably higher than commonly assumed. It also appears that women who sought biomedical health care in addition to care from the midwife (1) visited the latter about as often (six times on average) as women who saw

of babies were checked at a health center or post and 1.1 percent by a doctor, yielding a total of 4.0 percent of babies seen by only a biomedical provider.

²³ Given the relatively small proportion of mothers who reported seeing a nurse (1.7 percent), we include nurses in the category of doctors. For simplicity, we refer to this category as “doctors” rather than as “doctors and nurses.”

only the midwife; (2) visited the biomedical provider only slightly less frequently than those who saw only the biomedical provider; and (3) made more visits in total than those who saw only one type of provider.

Table 3.5 explores how many distinct providers women visited during pregnancy. For example, women who saw only midwives, and hence saw only one type of provider, may have seen two different midwives for prenatal care. The number of distinct providers is presented by the combination of types of providers visited in the first panel of Table 3.5 and by ethnicity in the second panel. The data show that, among pregnant women who visited only midwives, 97 percent saw only one midwife during the pregnancy. In contrast, among women who saw only private doctors, about one-sixth (17.5 percent) saw more than one doctor (or nurse). Overall, about one-third of women (32.9 percent) visited at least two providers (regardless of type) during pregnancy, but very few (four percent) visited three or more different people for care. Results by ethnicity reveal that *ladinas* saw more providers than indigenous women.

4. Frequency of Complications During Pregnancy and Delivery

Women were asked about the presence of serious complications during pregnancy, for the two most recent births that occurred between 1990 and 1995. Women were asked specifically about the following four serious complications: bleeding or hemorrhage, swelling of the hands or face, convulsions, and premature rupture of the membranes (“the water broke early”). Hemorrhage (i.e., excessive bleeding) can result in rapid death (Walsh et al., 1997) and is the single most common cause of maternal mortality in Guatemala, accounting for 24% of maternal deaths (OPS-OMS, forthcoming). Swelling of the hands or face (in contrast to swelling of the legs or other parts of the body) is a symptom of preeclampsia – i.e., high blood pressure or hypertension brought about by the pregnancy. This condition usually occurs in later pregnancy, particularly in the third trimester. If untreated, it can progress to eclampsia, which is an attack of convulsions that may result in serious injury or death to the fetus and the mother. Premature rupture of the membranes (i.e., the water breaking early) can also result in an increased risk of illness and death for the fetus and mother because it can lead to infection as well as prolapse of the umbilical cord.

After being asked about the presence of these four serious complications, women were asked whether they experienced any other *serious* problems during pregnancy and, if so, the nature of the problems. The most commonly reported complications were the following: pain or cramps in the stomach, back, head, legs, or feet; swelling elsewhere in the body; nausea, vomiting or lack of appetite; threat of abortion, malpresentation (fetus in a bad position) and infection. Note, however, that because women were not asked specifically about whether they had each of these other problems, the frequencies of these problems are likely to be underestimated from the data in the EGSF.

Women were also asked about complications at the time of delivery, again for their two most recent births between 1990 and the date of interview. Specifically, they were asked about whether the baby was in a bad position at the time of delivery and whether the woman had convulsions. Table 4.1 presents the proportions of women acknowledging each of the complications noted above pertaining to pregnancy and the time of delivery. Overall, almost eight percent of women had at least one of the four complications of pregnancy specifically mentioned in the questionnaire and more than one-fifth of the women had at least one of these complications or another complication that they considered serious. About five percent of the fetuses were in a bad position at the time of delivery.

In addition to the questions asked of women with recent pregnancies, midwives were asked how frequently they encountered various complications among their clients. Specifically, they were asked how often they saw women with each of thirteen specific complications that may occur during pregnancy or delivery. The responses, presented in Table 4.2, indicate that midwives see some complications fairly frequently – e.g., anemia during pregnancy, malpresentation of the fetus, multiple births, and high fever (or shivering) after delivery. On the other hand, about 80 percent or more of midwives have

never encountered a woman with swelling of the hands and face, convulsions, or tearing of the vagina during delivery.

As part of the birth history collected in the EGSF, women were asked whether each of her children was delivered normally or by cesarean section. The data in Table 4.3 show the frequencies of cesarean delivery by the age of the woman, department and ethnicity/language. The results indicate that four percent of births since 1990 were delivered by cesarean. This prevalence ranges from just under two percent in Totonicapán to almost six percent in Suchitepéquez. Estimates by ethnicity show a similar range of under two percent for non-Spanish speaking indigenous women to almost seven percent among ladinas. Although these values seem low compared with estimates for urban areas or for industrialized countries, one needs to bear in mind that only women who deliver in hospitals, health centers or clinics have the possibility of delivering by cesarean. According to the data in Tables 3.1 and 3.2, about 14 percent of women in the EGSF delivered in such facilities, with hospital deliveries being most likely in Suchitepéquez and among ladino women.

5. Referral Practices

Each provider that treats pregnant women was asked a series of questions in the EGSF about whether they refer these women to other providers or facilities. Midwives were asked how often they refer pregnant women to other persons for prenatal care and problems during pregnancy and delivery, and to whom they refer women during pregnancy and at the time of birth. Private doctors and personnel at health centers and posts were asked whether they refer pregnant women to hospitals, health centers, private doctors or clinics, midwives, or pharmacies, and, if so, the name of the particular providers or facilities.

Referrals by Midwives

As noted earlier, midwives are strongly encouraged during the training program to send their clients to the biomedical health system for additional care during pregnancy (e.g., to receive nutritional supplements and tetanus vaccinations) and for complications that develop during pregnancy, delivery, or the postpartum period. Table 5.1 shows the frequency with which the 66 midwives interviewed in the EGSF make referrals to other providers and facilities for problems during pregnancy and delivery. Overall, 80 percent of the sample of midwives indicate that they do – at least on occasion – make referrals to a biomedical provider for prenatal care or problems during pregnancy; one-third of midwives make referrals on a regular basis (frequently or always).²⁴ During the prenatal period, midwives most often refer to the health center or post, whereas for problems at the time of birth, they refer most frequently to the hospital. Referrals to other midwives are rare.

Estimates by department indicate that midwives in Jalapa and Chimaltenango refer their patients to biomedical providers much more frequently than do midwives in Suchitupéquez and Totonicapán. The data shown earlier in Table 2.1 suggest that these differences reflect more than variations in access to biomedical providers; although access to biomedical services is highest in Chimaltenango, it is poorest in Jalapa. However, it is important to recognize that the sample size of midwives in each department is quite small.

Effect of Training and Other Characteristics on Referral Practices

Table 5.2 shows the proportion of midwives that *regularly* (i.e., frequently or always) refer patients to biomedical providers, by several characteristics of the midwife and her community. These variables are described in more detail below. The first panel shows that 38 percent of trained midwives regularly refer pregnant women in comparison with only 12 percent of untrained midwives.²⁵ While this difference may reflect the

²⁴ The few midwives (five percent) who refer women to other midwives also refer women to at least one type of biomedical provider or facility. Thus, for simplicity, we assume that midwives who report that they *frequently or always* make referrals to other providers do so with regard to a biomedical provider.

²⁵ A statistical test indicates that this difference has a p-value of 0.06.

impact of the training program, it may also result from other differences between trained and untrained midwives that have nothing to do with their training status. For example, the difference could result from trained midwives living in areas with greater accessibility to biomedical health care. In order to control for the possible effects of other variables besides training, we estimate a multivariate regression model. Since the outcome of interest is binary (whether or not the midwife refers her clients to a biomedical provider or facility on a regular basis), we use a logistic regression model.

The model includes seven explanatory variables thought to affect the likelihood that midwives make referrals. Three of these denote characteristics of the midwife: (1) whether she attended a training course for midwives; (2) whether she received any formal education; and (3) her ethnicity (ladina or indigenous). The midwife's education may affect her overall exposure to and comfort with biomedical beliefs and providers, beyond her experiences in the short training program. Indigenous women may be less likely to make referrals than ladinas because of differences in health beliefs, cultural practices, and socioeconomic status, and because of discrimination towards indigenous patients at public health facilities (e.g., Cosminsky, 1982; Hurtado and Esquivel, 1986; Rosenthal, 1987; Schieber and Delgado, 1993).

Four additional variables reflect characteristics of the community: (1) whether a biomedical provider is present within the community; (2) whether the community has regular bus transportation; (3) the average household consumption per capita of the respondents living in the community (an alternative measure for the income level of the community); and (4) the department in which the community is located. The first of these variables measures women's access to biomedical providers and reflects the degree to which midwives may have been exposed to and influenced by biomedical beliefs and practices. Thus, the presence of a doctor or health center or post in the community should increase the likelihood that midwives make referrals. Midwives should also be more likely to make referrals in communities with adequate transportation systems in light of the remoteness of many of the biomedical providers and facilities (especially hospitals). The average income in the community may affect referrals to the extent that higher income is associated with increased contact with urban areas and exposure to and acceptability of Western ideas among the women and the midwife. Finally, the department variables are included in the model because of the nature of the sampling plan.

The estimates from the model²⁶ shown in Table 5.3 reveal that, controlling for other characteristics of the midwife and her community, midwife training has a large and statistically significant effect on referral practices. Specifically, the odds of referring a pregnant woman to a provider are 23 times as high for a trained as compared with an

²⁶ These estimates are referred to as odds ratios and are calculated as the odds for a given category of a variable divided by the odds for the omitted category of that variable. For example, suppose that the probability that a trained midwife makes regular referrals is equal to p_1 and the probability that an untrained midwife (the omitted category) makes regular referrals is equal to p_2 . Then, the odds ratio associated with being a trained midwife is equal to $p_1/(1-p_1)$ divided by $p_2/(1-p_2)$. According to the estimates in Table 5.3, this odds ratio is equal to 23.33, after controlling for other factors included in the model.

untrained midwife.²⁷ Surprisingly, however, the midwife's education has virtually no impact on the likelihood that she refers patients elsewhere. As expected, indigenous midwives are much less likely to refer pregnant women to other providers. Although not significantly related to referral status, midwives in communities with regular bus transportation are more likely to make referrals. None of the following variables – the presence of a biomedical provider, the income level of the community, and the department of residence – is significantly related to referral practices.

Referrals by Health Centers and Posts and Private Doctors

Table 5.4 shows the percentage of health centers and posts in the EGSF that refer women to particular providers or facilities. All centers and posts make referrals to hospitals, and more than half of health posts make referrals to health centers. Only about one-fifth make referrals to private doctors and a similar proportion refer to midwives. There appear to be large differences across departments in the proportion of centers and posts that refer to doctors or midwives, but because of the small number of facilities in the sample, these differences are not statistically significant.

The second panel of Table 5.4 presents corresponding estimates for referrals by private doctors. As with health centers and posts, all doctors in the sample make referrals to hospitals. However, fewer than half of the doctors refer to health centers and posts. Most doctors make referrals to other doctors. Only 12 percent (or a total of three doctors) refer to midwives; these three doctors reside in Jalapa. Again, although there appear to be some large differences across the departments, these differences are not statistically significant because of the very small number of doctors in the sample for each department.

²⁷ The much larger estimated (OR=23) as compared with observed odds ratio (OR=4) associated with training is largely due to the fact that trained midwives are more likely to be indigenous and less likely to have accessible transport, as compared with untrained midwives.

6. Motivation for Seeking Care and Content of Care

Motivation for Seeking Care

Women may see a provider during their pregnancy for regular prenatal care or because of a specific problem or complication. In the EGSF, women were asked why they saw each of the providers that they visited during pregnancy, for their two most recent births between 1990 and 1995. Information was obtained for a total of 4,359 providers (Table 6.1). Most of these providers (3,705 out of 4,359 or 85 percent) were seen for regular pregnancy care. Only six percent (248) of the providers were seen because the woman had a problem during pregnancy and another nine percent (406) were seen for both regular pregnancy care and a problem. Women seeking a provider for regular pregnancy care (and not a problem) were much more likely to see a midwife as compared with women looking for treatment for a complication. Women with a problem were about as likely to visit posts and centers as private doctors.

Table 6.2 shows the distribution of problems among the 654 providers seen because of a complication of pregnancy, by the type of provider. For each type of provider, the most common problem was pain or cramps in the stomach, back, head, arms, legs, or feet. Other frequently experienced complications were malpresentation, swelling (other than the hands or face), and nausea, vomiting, or lack of appetite. In comparison with midwives and health centers and posts, doctors were more likely to be seen for very serious problems, such as infection or high fever, threat of miscarriage, hemorrhage, and symptoms of eclampsia or preeclampsia (swelling of the hands or face, high blood pressure and convulsions).

Content of Care

Unlike other surveys in Guatemala that focus primarily on the use of health services, the EGSF collected unusually detailed information on the content of care. Data on the content of pregnancy care are available from two sources in the EGSF: interviews with mothers and interviews with midwives. In the first case, mothers who visited any type of provider (i.e., midwives or biomedical providers) during pregnancy were asked several questions about the procedures and treatments used. Specifically, they were asked whether the provider checked the baby's position, took the woman's blood pressure, drew blood, gave her an injection, or gave her a prescription, medicine, or remedy. They were also asked whether a provider gave her an injection at the time of delivery and the purpose of the injection. In the second source of data – the provider interviews – midwives (but *not* biomedical providers) were asked whether they perform each of an extensive list of services and treatments related to pregnancy care, and the frequency with which they do so. Midwives were also asked an open-ended question regarding the most important type of care that they give women during pregnancy and birth.

Table 6.3 presents the results from the interviews with midwives. With regard to the prenatal period, the estimates in Table 6.3 indicate that nearly all midwives routinely

check the position of the fetus and give advice about foods that the mother should or should not eat during pregnancy. Most midwives, at least on occasion, try to change the position of the baby and administer herbal remedies. Surprisingly, the traditional practice of massage is far from universally practiced, even though many ethnographic studies have stressed the importance and pervasiveness of this practice among midwives (Acevedo and Hurtado, 1997; Cosminsky, 1982; Greenberg, 1982; Lang and Elkin, 1997).²⁸

Most midwives (85 percent) routinely tie the woman's stomach after birth – a practice “condemned” by the training courses, although there is no scientific evidence that it is harmful. A much smaller proportion (about a third) prepare the traditional sweatbath (*temascal*). Previous largely ethnographic research has stressed the importance of the sweatbath, especially during the postpartum period and among the indigenous population (Cosminsky, forthcoming; Acevedo and Hurtado, 1997), although estimates of its prevalence have not been available.

The data also indicate that midwives frequently use some biomedical procedures. For example, more than 60 percent of midwives have ever performed a vaginal exam. Moreover, about 30 percent of midwives have taken a woman's blood pressure or pulse, or given injections of vitamins. Other biomedical treatments and practices – giving antibiotics, tetanus immunizations, or injections of medicine, or administering injections at the time of delivery – appear to be considerably less common among midwives (as shown in the lower panel of Table 6.3). The potential dangers associated with some of these practices are discussed in the following section.

Midwives' responses to the open-ended question on the most important type of care that they give pregnant women are shown in Table 6.4. The most common response is that the mother should eat well (*alimentarse, buena alimentación*). Other frequent responses pertain to ensuring that the pregnant woman maintains her personal hygiene and that she avoids lifting heavy objects or overexertion. Very few responses involve recommendations to see a biomedical provider (even though, as we saw in the previous section, many midwives refer their patients to one) or the use of biomedical treatments.

Reports from *mothers* regarding the practices of midwives during pregnancy, as well as the practices of biomedical providers, are shown in Table 6.5.²⁹ Because the sample of women's reports about providers is much larger than the sample of providers' reports, we also present the estimates in Table 6.5 separately for each of the four departments.

²⁸It is possible that midwives may have underreported the practice of massage in the EGSF because the questionnaire used the word “masaje” rather than the more appropriate term “sober.” Because the providers interviews were administered only in Spanish, it is also possible that some indigenous midwives may not have understood the question.

²⁹Note that the estimates derived from mothers' reports differ in several ways from those based on midwives' reports. For example, midwives who treat few patients “count” as much as midwives who treat many patients in estimates derived from the midwife interviews. However, the latter midwives have greater representation than the former in estimates based on mothers' responses, because they have more clients (i.e., mothers) to report their practices.

As with the data from midwives, these reports indicate that almost all providers checked the position of the fetus. The remaining procedures listed in Table 6.5, all of which are biomedical practices, are, not surprisingly, much more common among doctors and the staff of health centers and posts than among midwives. For example, almost all doctors took the pregnant woman's blood pressure whereas only about one-third of midwives did so. A higher proportion of women reported receiving injections during pregnancy from a health center or post (55.1 percent) than from a doctor (30.4 percent) – results that are consistent with the fact that pregnant women often go to centers or posts to receive vaccinations. Several of these procedures show little variation in frequency across departments. However, use of injections varies considerably by department, for each type of provider. In addition, the proportion of midwives who measure blood pressure ranges from a low of 17 percent in Jalapa to a high of 45 percent in Chimaltenango.

Mothers' reports regarding injections received at the time of delivery are presented in Table 6.6, for the entire sample and by department. The estimates are presented according to whether a doctor, nurse or midwife attended the birth. The results indicate that, in every department, doctors (and nurses) were much more likely than midwives to administer injections at the time of delivery. Overall, about two-thirds of the doctors seen by the respondents did so, in contrast to less than one-fifth of the midwives. The data also reveal large variation across departments in the frequency with which midwives administer injections at the time of delivery, ranging from only six percent of midwives in Jalapa to more than one-quarter of midwives in Chimaltenango. The more widespread use of injections at the time of delivery in Chimaltenango is consistent with the findings from Table 6.5 which show more frequent use of injections during pregnancy in this department.

7. Quality of Care Provided by Midwives

Although several large-scale studies in Guatemala have measured the *use* of health care during pregnancy, there is very little research on the *quality* of the pregnancy-related care that midwives or other providers offer in Guatemala. This limitation is not restricted to Guatemala but rather reflects a general lack of knowledge about the quality of prenatal care even in the industrialized world. Most of the literature attempting to evaluate the adequacy of prenatal care has looked at measures of the timing and frequency of visits to providers, not on the actual content of services. However, there is no evidence that the amount of care is an important determinant of birth outcomes, such as birth weight or infant mortality (Petitti et al., 1991; Stringer, 1998).

In this section of the report, we use the detailed information on practices and treatments reported by midwives in the EGSF (Table 6.3) to try to assess the quality of care offered by midwives in rural Guatemala. It is important to note that there are other practices – harmful and beneficial – that midwives in Guatemala do but are not included in the EGSF and therefore are not included in this analysis. Because biomedical providers were not asked about the procedures that they use to treat pregnant women, we are unable to carry out a similar analysis for these providers.

Potential Benefit or Harm Associated with Practices

In order to derive a measure of the quality of care, we first assess the potential benefit or harm associated with each of the practices and treatments reported by midwives. The assessments are based on scientific evidence of the potential effects of these practices as well as their appropriateness given midwives' training and the circumstances under which they practice in rural Guatemala.

In many cases, we are unable to classify the procedures as either harmful or beneficial because we do not have enough information from the EGSF regarding the practice. For example, whereas one might classify the practice of midwives giving women advice about food as beneficial, we have no information as to the content of the advice. Such advice might consist of recommendations to eat nutritious types of food, but it might also entail prohibitions on eating certain foods because of possible hot-cold imbalances.³⁰ Similarly, although one might consider the taking of blood pressure as an essential component of care in developed countries (e.g., to detect preeclampsia or eclampsia), we have no information from the survey to indicate whether midwives know how to take a blood pressure reading or to evaluate the result.³¹ We also are unable to

³⁰ Two other procedures in this category are examining the position of the baby and trying to change the position. The former procedure can enable the midwife to detect malpresentation, while the latter, if done successfully at term (37 weeks or more), may avoid the need for a cesarean delivery (Jordan, 1993; Goer, 1995; Enkin et al., 1995).

³¹ Midwives are not taught to take blood pressure readings, nor are they given blood pressure cuffs. Rather, they are trained to detect swollen faces and hands and to refer women who present these symptoms to a biomedical provider.

classify several procedures because of lack of scientific data regarding the practice. For example, there is inconclusive or insufficient information in the scientific literature regarding the potential benefits or harm associated with herbal remedies, massage, sweatbaths, or binding the woman's stomach after delivery (Cosminsky, 1977, 1982; Enkin et al., 1995; Putney & Smith, 1989).

Among the practices included in the EGSF, we identified 10 practices that are likely to be either harmful or beneficial. Practices considered to be advantageous are coded as "beneficial" if the midwife reports that she *normally* performs them. Practices considered likely to be dangerous under any circumstance are coded as "harmful" if the midwife reports that she *ever* uses them. Practices that may be appropriate under certain circumstances but harmful in others (e.g., vaginal exam, pushing on the stomach and supplemental feeding) are classified as "harmful" only if the midwife reports that she performs them *normally*.

On the basis of scientific evaluations (Bartlett & Paz de Bocaletti, 1991; Bartlett et al., 1993; Goer, 1995; Liskin, 1992; Okeke, 1999; Safe Motherhood, 1998; WHO, 1994; WHO, 1996; Williams and Heymann, 1998), we classify the following six procedures as harmful:

- (1) ever giving an injection to speed delivery;
- (2) ever giving antibiotics during pregnancy or delivery³²;
- (3) ever putting powder or ointment on the umbilical cord;
- (4) normally pushing on the stomach at the beginning of delivery;
- (5) normally performing a vaginal examination during pregnancy; and
- (6) normally telling the mother to give the baby sugar water or tea in the first week of life.

On the basis of a similar set of scientific evaluations (Enkin et al., 1995; Safe Motherhood, 1998; WHO, 1994; WHO, 1996), we consider the remaining four items to be beneficial:

- (1) normally keeping the baby warm after birth;
- (2) normally encouraging breastfeeding;
- (3) normally encouraging immunization; and
- (4) normally checking the mother and baby during the postpartum period.

Frequencies pertaining to these 10 midwife practices are shown in Table 7.1, overall and by department. Beneficial practices have been coded in terms of midwives *failing to perform* the activity so that each frequency denotes the prevalence of a harmful practice. The prevalence of these practices varies enormously across the 10 items. More than three-quarters of midwives recommend that the pregnant women supplement breastfeeding in the first week of life, presumably because the midwives believe that colostrum provides insufficient nutrition (Lang and Elkin, 1997). We consider this practice to be harmful because the biomedical literature suggests that early supplementation may interfere with the initiation or continuation of breastfeeding (Safe

³² We consider the use of antibiotics by midwives harmful because these drugs should not be administered by persons without medical training.

Motherhood, 1998). In contrast, several harmful practices are rare: few midwives fail to encourage women to immunize their children and to breastfeed them, less than five percent ever give antibiotics to their patients, and about 11 percent of midwives do not routinely keep the baby warm after birth.

As shown in Table 7.1, almost 40 percent of midwives routinely do a vaginal exam, a practice that is considered potentially harmful because of the risk of infection. Although very high, this estimate is lower than that obtained in a study in Santa María de Jesús in the Department of Sacatepéquez in the mid-1980s, in which three-quarters of women reported that midwives performed vaginal exams (Bartlett and Paz de Bocaletti, 1991).

Several potentially harmful treatments pertaining to the time of delivery or shortly thereafter continue to be common, at least as of 1995 when the EGSF took place. For example, almost a quarter of midwives routinely push on the abdominal area at the beginning of delivery. Moreover, half of midwives normally put powder or ointments on the umbilical cord. Both of these procedures are considered dangerous, the former because of its association with uterine complications and the latter because of risk of infection or tetanus (Liskin, 1992; WHO, 1994; WHO, 1996).

In addition, about 12 percent of midwives have used injections to speed delivery (presumably oxytocin). While not very high, this frequency is troubling given the potential dangers to the infant and mother associated with this practice. Specifically, intramuscular injection of oxytocin during labor is considered dangerous regardless of the provider administering the injection because the dose cannot be adapted as it can with intravenous administration (WHO, 1996). However, it is worth noting that this estimate, as well as the estimate reported by mothers of 15 percent of midwives using injections (Table 26), are lower than those from other studies. For example, data from a 1986 study in Santa María de Jesús indicate that intramuscular injections of oxytocin were used in more than half of births (Bartlett and Paz de Bocaletti, 1991), and a study in Quetzaltenango (Schieber, 1992) reports that about 40 percent of midwives used these injections. The lower estimates from the EGSF may be a result of the exclusion of urban areas from the sample; use of oxytocin is thought to be highest in the highlands and in areas close to the major cities (Bartlett et al., 1993).

The data in Table 7.1 reveal that the prevalence of harmful practices varies enormously across the four departments in the sample. For example, *none* of the (15) midwives in Chimaltenango report that they normally check the mother and baby during the postpartum period. In contrast, the vast majority of midwives in the other three departments offer postpartum checks. On the other hand, whereas only one-fifth of midwives in Chimaltenango ever put powder or ointment on the umbilical cord, the majority of midwives in the other departments have done so.

Measuring Quality of Care

Our measure of quality of care is based on the 10 practices listed in Table 7.1. Each midwife received a point for every harmful procedure that she practices and the

points were summed for each midwife to create an index of the quality of care. Thus, a midwife's score reflects the total number of harmful practices that she performs. In theory, the index can range between 0 and 10, although no midwife has a value higher than five. As shown by the distribution of the index in Figure 7.1, most midwives perform between one and four of these harmful activities.

We also explored some alternative types of indices— e.g., weighting “more dangerous” procedures more heavily – but we recognize the arbitrariness of any choice of weights. Nevertheless, we repeated the analysis presented here under several distinct rules for creating the indices (e.g., giving little weight to or dropping several measures from the index). We found that our results changed little with these alternative specifications. However, it is important to keep in mind that this measure of quality of care is restricted to the frequency with which certain procedures are used. It does not take into account other dimensions of care, such as the relation between the midwife and client, time spent with the client, etc.

Effect of Midwife Training and Other Characteristics on Quality of Care

Table 7.2 shows the average value of the index by the following six variables pertaining to the midwife and the community: (1) whether the midwife attended a training course; (2) whether the midwife received any formal education; (3) the midwife's ethnicity; (4) whether a biomedical provider is present within the community; (5) the average household consumption per capita of the respondents living in the community; and (6) the department in which the community is located. These variables are the same ones used to examine the effects of midwife training on referral practices, except that here we exclude the availability of bus transportation. Access to public transportation is less likely to be associated with the content or quality of care as compared with referrals of patients to another, potentially distant provider.

As shown in Table 7.2, trained midwives have almost identical values on the index of quality of care as untrained midwives (2.58 as compared with 2.69). This result suggests that training programs for midwives have had almost no effect on the total prevalence of these harmful (or beneficial) practices. As in the case of referral practices, it is possible that this result is due to differences between trained and untrained midwives that are unrelated to the training programs. In order to see if this is the case, we estimate a linear regression model in which the quality of care index is the outcome variable and the explanatory variables are the six characteristics of midwives and communities described above. Our motivation for including these variables is similar to the rationale described in Section 5 with regard to the statistical model of referral practices. In the case of the presence of a biomedical provider, we believe that the presence of these providers may result in an informal checking of the midwives' practices, or at least a constraint on their behavior. The nearby presence of a biomedical provider may also indicate that there is less need for the midwife to offer biomedical procedures.

The results from the regression model (i.e., the estimated coefficients) are shown in Table 7.3. The small and insignificant coefficient associated with training strengthens

our conclusion that the midwife training programs appear to have had virtually no effect on the overall quality of midwife care, as measured in this analysis. As in the case of referral practices, the effects of the midwife's education and the income level of the community are insignificant. However, the presence of a biomedical provider in the community is associated with a higher quality of care (i.e., a *lower* score of harmful practices). Moreover, indigenous midwives appear to offer a lower quality of care than *ladinas*. Specifically, the coefficient indicates that indigenous midwives have 1.13 more harmful practices as compared to *ladina* midwives, after controlling for other variables in the model.

III. SUMMARY

1. The Encuesta Guatemalteca de Salud Familiar: Survey Design and Characteristics of Families and Communities

The EGSF (1995) is based on a sample of 60 rural communities and contains detailed interviews with 2,872 women ages 18-35. The survey also contains interviews with key informants and traditional and biomedical providers within each of the communities. Much of the data for this report come from the interviews with women, specifically from questions pertaining to women's experiences during their recent pregnancies, and from interviews with providers. Simple tabulations provide a description of the socioeconomic status, ethnicity, and demographic characteristics of women and their families, as well as the infrastructure and economic base of the communities in the sample.

2. Providers and Facilities

Data on access, cost, and characteristics of providers underscore the difficulties of ensuring high quality maternity care to rural Guatemalan women. Midwives are the most accessible provider for care during pregnancy and delivery, but not the most affordable. Health posts and centers are the least costly alternative. However, many women may not be able to afford medicines prescribed at these government facilities and, although health centers and posts are a source of free prenatal supplements, the supply at these facilities is unreliable. Moreover, although the relevant data were not collected in the EGSF, studies have identified additional factors, such as discrimination and language barriers, that prevent many women from seeking care at such facilities. Private doctors often have their practices far from small rural communities and charge extremely high prices for their services, relative to the earnings of rural Guatemalans. The lack of specialized equipment at health centers, health posts, and doctors' offices highlights the urgency of transport to a hospital during complicated deliveries. Unfortunately, hospitals are also not very accessible to women living in these rural communities.

3. Patterns of Care During Pregnancy, Delivery and the Postpartum Period

Almost all women received some form of care during pregnancy, although many women did not receive any care for themselves or their infant after the birth. Most women saw a midwife for care during pregnancy, delivered at home with the assistance of a midwife, and relied on the midwife for postpartum care. During pregnancy, biomedical providers were most often sought in combination with a midwife rather than on their own. Use of biomedical providers varies considerably by ethnicity and by other social and cultural characteristics. Pregnant women made an average of eight visits to a provider during pregnancy, and more than half made their first visit prior to the fifth month of pregnancy.

4. Complications During Pregnancy and Delivery

Almost eight percent of women had at least one of the four complications of pregnancy specifically mentioned in the questionnaire. More than one-fifth of the women had at least one of these complications or another complication that they considered serious. Only four percent had a cesarean delivery.

5. Referral Practices

About 80 percent of midwives make referrals to biomedical facilities or providers, at least occasionally, although only one-third refer on a regular basis. Midwives are most likely to refer women to health centers or posts during the prenatal period, and women with complicated deliveries to hospitals. The training programs appear to have had a substantial impact on the frequency of referrals, with trained midwives being much more likely to refer their patients than untrained midwives. All health centers, posts, and doctors refer pregnant women to hospitals.

6. Motivation for Seeking Care and Content of Care

The vast majority of mothers visited providers during pregnancy for regular care rather than for complications. About 70 percent of the providers that were sought for regular care were midwives and about 30 percent were biomedical providers. By contrast, more than half of the providers seen because of complications were doctors or the staff of health centers and posts. Not surprisingly, midwives were much less likely to employ biomedical procedures or treatments than were biomedical providers. Nevertheless, a substantial proportion of midwives acknowledged using certain biomedical practices, such as performing a vaginal exam or taking a woman's blood pressure or pulse. Midwives continue to offer many traditional treatments although some may be less prevalent than in the past. For example, only about half of the midwives report that they routinely use abdominal massage – a prevalence much lower than that implied by earlier studies. Use of the traditional sweatbath (*temascal*) or herbal remedies may also be declining.

7. Quality of Care Provided by Midwives

On the basis of current scientific evidence, we identified 10 practices included in the EGSF survey of midwives that are likely to be either beneficial or harmful. While some of these practices are rarely used by midwives (e.g., giving antibiotics), others are disturbingly frequent (e.g., putting powder or ointment on the umbilical cord). An index of the quality of care, based on these 10 practices, indicates that the midwives in the EGSF sample perform between two and three of these practices on average. There appears to be no association between whether the midwife is trained and the overall frequency of these practices.

IV. DISCUSSION

This analysis has provided mixed findings regarding the efficacy of efforts aimed at integrating midwives into the formal health system. As suggested by earlier work, the training programs appear to be widespread: about three-quarters of midwives in the EGSF sample have attended such a course. However, in spite of these training courses, most pregnant women do not see a biomedical provider at any point during pregnancy. Previous research offers numerous reasons for women's low utilization of biomedical care, even when they are given a referral by a midwife: fear (of the treatments or the personnel), condescending attitudes of the providers, refusal by women's spouses, embarrassment, perceptions of poor quality of care, limited hours of service, language constraints, poor access to health facilities, and lack of resources (Cosminsky, 1982; Hurtado and Saenz de Tejada, forthcoming; Rosenthal, 1987).

Among women who do seek care from doctors or government facilities during pregnancy, most do so in addition to seeing a midwife. This is especially true of indigenous women, who are not only less likely than *ladinas* to seek biomedical care, but are very unlikely to seek only biomedical care. Findings from an earlier study stress the significance of social and cultural explanations for the low use of biomedical pregnancy care among the indigenous population. Taken together, these results underscore the importance of efforts toward integrating the midwife into the formal health care system in lieu of policies designed to replace the midwife with biomedical providers.

The results also indicate that women who combine midwife and biomedical care make several visits to the biomedical providers rather than the single visit suggested by some previous studies. Thus, while the levels of use of biomedical care during pregnancy may not be as high as desired, women who seek such care do so fairly regularly. However, this is not the case with the postpartum period. Almost one-third of women in the sample saw no provider during the 40 days after birth. Given the risk of postpartum complications to both mothers and infants, this is a time when more women need to be examined—by midwives or by biomedical providers.

The survey of midwives reveals that, consistent with the objectives of the training programs, the majority of midwives do—at least occasionally—refer their patients to other providers for prenatal care and for problems. However, most do not make referrals on a regular basis. The training programs appear to have had an enormous impact on the frequency of referrals, with trained midwives being much more likely to refer their patients than untrained ones. The fact that most midwives—even trained ones—do not regularly refer their clients is likely due to various factors described by Hurtado and Saenz de Tejada (forthcoming). For example, many of the midwives in their study reported being uncomfortable with the poor treatment they received from the staff at government health facilities. Moreover, fewer than half of the midwives had actually been to the hospital designated for their referrals and hence they felt uneasy about making referrals to a place they did not know.

A detailed examination of the contents of midwife care demonstrates that midwives continue to offer many traditional treatments although some may be less prevalent than in the past. For example, abdominal massage is routinely used by only about half of the midwives and the use of the traditional sweatbath or herbal remedies may also be on the decline. Although the absence of data from several time points does not permit us to verify trends, midwife practices are probably becoming increasingly biomedicalized as well. For example, the EGSF data reveal that a relatively large fraction of midwives have adopted biomedical practices such as performing vaginal exams.

Medicalization of midwife care is of particular concern to the extent that midwives adopt practices that are harmful or inappropriate given their training and setting. While some biomedical practices are probably beneficial even when used by an untrained midwife (e.g., giving vitamins) and others may be harmless at worst (e.g., taking blood pressure), some treatments are potentially dangerous to the pregnant woman and her unborn child. Even if training programs have achieved modest success in reducing the prevalence of traditional practices deemed harmful, this "positive" effect is likely to be offset by increasing medicalization. Because midwives are increasingly being exposed to biomedical treatments that require extensive training for appropriate use, they are becoming ever more likely to inappropriately adopt some of these procedures into their own practices. Results from our statistical model of quality of care support this supposition. When measured in terms of 10 traditional and biomedical practices that we have identified as either beneficial or harmful, the training status of midwives reveals no association with the overall quality of care. This is not to say, of course, that the midwife training programs would not be more efficacious if they were to modify their teaching methods and course content in line with the many criticisms targeted at them.

A serious limitation of the present study is its one-sidedness: while providing an evaluation of midwife care, this investigation does not offer a corresponding assessment of biomedical pregnancy-related care. This is an unavoidable drawback, because the EGSF did not collect extensive information on the content of pregnancy care offered by government-sponsored health facilities and private doctors.

Nevertheless, the limited information that is available from the EGSF points to several serious problems associated with biomedical pregnancy care in Guatemala. First, interviews with personnel at health posts and centers substantiate findings from earlier studies regarding the widespread lack of resources. For example, almost half of the 48 facilities included in the survey lack fetal stethoscopes and a similar proportion lack iron supplements. Second, data from a qualitative study undertaken as part of this project document the lack of social support experienced by women during hospital births (Carter, 1999). Third, reports from women interviewed in the EGSF on the use of injections during pregnancy reveal that more than one-quarter of women who gave birth in hospitals did not know the purpose of the injection they received, in contrast to about five percent of women who gave birth at home. This finding suggests that hospital staff may fail to explain to women the nature of and risks associated with treatments that women receive. Apart from the EGSF, there is anecdotal evidence (e.g., from health providers and the

media) that excessive interventions, such as high rates of cesarean delivery, may be a problem in some Guatemalan hospitals.

These limited depictions of biomedical care make it apparent that the successful integration of midwives into the formal health care system must involve more than the modification of midwife practices to make these practices consistent with biomedical standards. High quality pregnancy care must also entail the monitoring and modification of the practices of biomedical providers that serve pregnant women to (1) guarantee respect for the woman and her family; (2) avoid conflict with social and cultural norms; and (3) ensure that treatments are based on scientific evidence rather than convention and convenience of the provider. The collection of additional detailed information on the content of pregnancy-related care offered by both traditional and biomedical providers would be an appropriate starting point for this major undertaking.

REFERENCES

- Acevedo, D. and E. Hurtado. 1997. "Midwives and Formal Providers in Prenatal, Delivery, and Post-Partum Care in Four Communities in Rural Guatemala: Complementarity or Conflict?" Pp. 271-326 in *Demographic Diversity and Change in the Central American Isthmus*, edited by A.R. Pebley and L. Rosero-Bixby. Santa Monica, CA: RAND Corporation.
- Bartlett, A. V., M.A. Bocaletti, and M.E. Paz de Bocaletti. 1993. *Use of Oxytocin and Other Injections During Labor in Rural Municipalities of Guatemala: Results of a Randomized Survey*. Working Paper #22. Report prepared for the Agency for International Development. Arlington, VA: MotherCare Project.
- Bartlett, A.V. and M.E. Paz de Bocaletti. 1991. "Intrapartum and Neonatal Morality in a Traditional Indigenous Community in Rural Guatemala." *Acta Paediatrica Scandinavica* 80:288.
- Carter, M. 1999. *Social Support During Pregnancy, Birth, and La Dieta Among Rural Guatemalan Women*. Paper presented at the Seminario de la Población de Isthmus de América Central al Fin del Milenio, sponsored by RAND and the University of Costa Rica, October 20-22, Jaco, Costa Rica.
- Cosminsky, S. 1977. "Childbirth and Midwifery on a Guatemalan Finca." *Medical Anthropology* 1(3):69-104.
- Cosminsky, S. 1982. "Childbirth and Change: A Guatemalan Study." Pp. 195-219 *Ethnography of Fertility and Birth*, edited by C.P. McCormack. New York: Academic Press.
- Cosminsky, S. Forthcoming. "Midwives of Southern Mexico and Guatemala." In *Mesoamerican Healers*, edited by B. Huber and A. Sandstrom. Austin, TX: University of Texas Press.
- Cosminsky, S. and M. Scrimshaw. 1980. "Medical Pluralism on a Guatemalan Plantation." *Social Science and Medicine* 14B:267-278.
- Deaton, A. 1989. *Savings in Developing Countries: Theory and Review*. Proceedings of the World Bank Conference on Development Economics 61-96. Washington, D.C.: The World Bank.
- Enkin, M., M. J.N.C. Keirse, M. Renfrew, and J. Neilson. 1995. *A Guide to Effective Care in Pregnancy and Childbirth*. 2nd Edition. Oxford: Oxford University Press.
- Glei, D.A. and N. Goldman. 2000. "Understanding Ethnic Variation in Pregnancy-Related Health Care in Rural Guatemala." *Ethnicity and Health* 5(1):5-22.
- Goer, H. 1995. *Obstetric Myths Versus Research Realities*. New Haven, CT: Bergin and Garvey.
- Gragnotati, M. 1998. *Children's Malnutrition in Rural Guatemala: A Multi-Level Statistical Analysis*. Unpublished Dissertation. Princeton, NJ: Princeton University.
- Greenberg, L. 1982. "Midwife Training Programs in Highland Guatemala." *Social Science and Medicine* 16:1599-1609.
- Hurtado, E. and A. Esquivel. 1986. *Guatemala*. INCAP Publication No. C-242.

- Hurtado, E. and E.S. Saenz de Tejada. Forthcoming. "Relations Between Traditional Midwives and the Official Health System in Guatemala." In *Mesoamerican Healers*, edited by B. Huber and A. Sandstrom. Austin, TX: University of Texas Press.
- Instituto de Nutrición de Centro América y Panamá (INCAP), Demographic and Health Surveys (DHS), and Ministerio de Salud Pública y Asistencia Social (MSPAS). 1989. *Guatemala: Encuesta Nacional de Salud Materno Infantil, 1987*. Columbia, MD: Institute for Resource Development/Westinghouse.
- Instituto de Nutrición de Centro América y Panamá (INCAP). Ministerio de Salud Pública y Asistencia Social (MSPAS), USAID, DHS/Macro International. 1997. *Salud Materno Infantil en Cuatro Departamentos de Antiplano. Resultados de la Encuesta de Proveedores de Salud, 1997*. Guatemala City, Guatemala: INCAP.
- Instituto Nacional de Estadística (INE), Ministerio de Salud Pública y Asistencia Social (MSPAS), USAID, UNICEF, and Demographic and Health Surveys (DHS). 1996. *Guatemala: Encuesta Nacional de Salud Materno Infantil, 1995*. Calverton, MD: DHS/Macro International Inc.
- Jordan, B. 1993. *Birth in Four Cultures: A Crosscultural Investigation of Childbirth in Yucatan, Holland, Sweden, and the U.S.* Prospect Heights, IL: Waveland Press.
- Lang, J.B. and E.D. Elkin. 1997. "A Study of the Beliefs and Birthing Practices of Traditional Midwives in Rural Guatemala." *Journal of Nurse-Midwifery* 42(1):25-31.
- Leedam, E. 1985. "Traditional Birth Attendants." *International Journal of Gynaecology and Obstetrics* 23:249-274.
- Levitt, M.J. and M. Minden. 1995. "The Role of Traditional Birth Attendants in Safe Motherhood." Pp. 309-18 in *Health Care of Women and Children in Developing Countries, 2nd Edition*, edited by H.M. Wallace, K. Giri, and C.V. Serrano. Oakland, CA: Third Party Publishing Company.
- Liskin, L.S. 1992. "Maternal Morbidity in Developing Countries: A Review and Comments." *International Journal of Gynecology and Obstetrics* 37:77-87.
- Mahler H. 1987. "The Safe Motherhood Initiative: A Call to Action." *Lancet* 1(8534): 668-70.
- Ministerio de Salud Pública y Asistencia Social (MSPAS). 1989. *Estudio de Mortalidad Materna en Guatemala*. Report by the Departamento Materno Infantil, Ministerio de Salud Pública y Asistencia Social. Guatemala.
- Ministerio de Salud Pública y Asistencia Social (MSPAS). 1999. *Avances y Perspectivas. Extensión de Cobertura con Servicios Básicos de Salud. I Nivel de atención*. Manuscript. Guatemala: MSPAS, SIAS.
- Montgomery, M.R., M. Gragnolati, K.A. Burke, and E. Paredes. 2000. "Measuring Living Standards with Proxy Variables." *Demography* 37(2):155-174.
- National Research Council (NRC). 1997. *Healthy Pregnancy and Childbearing*. Pp. 116-145 in *Reproductive Health in Developing Countries: Expanding Dimensions, Building Solutions*, edited by A.O. Tsui, J.N. Wasserheit, and J.G. Haaga. Washington, DC: National Academy Press.
- Okeke, I.N., A. Lamikanra, and R. Edelman. 1999. "Socioeconomic and Behavioral Factors Leading to Acquired Bacterial Resistance to Antibiotics in Developing Countries." *Emerging Infectious Diseases* 5(1):18-27.

- Organización Panamericana de La Salud – Organización Mundial de la Salud (OPS-OMS). Forthcoming. *Condiciones de Salud de Las Americas 2001*. Guión Guatemala.
- Pan American Health Organization (PAHO). 1998. "Guatemala." Pp. 294-302 in *Health in the Americas*, 1998 edition, Volume II.
- Pebley, A.R. and N. Goldman. 1997. *Encuesta Guatemalteca de Salud Familiar (EGSF), Apéndice B: Cuestionarios en Español*. Santa Monica, CA: RAND.
- Pebley, A.R., N. Goldman, and G. Rodríguez. 1996. "Prenatal and Delivery Care and Childhood Immunization in Guatemala: Do Family and Community Matter?" *Demography* 33(2):231-247.
- Pebley, A.R., E. Hurtado, and N. Goldman. 1999. "Beliefs About Children's Illness." *Journal of Biosocial Science* 31:195-219.
- Peterson, C., N. Goldman, and A.R. Pebley. 1997. *The 1995 Guatemalan Survey of Family Health (EGSF): Overview and Codebook*. Santa Monica, CA: RAND.
- Petitti, D.P., R.A. Hiatt, V. Chin, and M. Croughan-Minihane. 1991. "An Outcome Evaluation of the Content and Quality of Prenatal Care." *Birth* 18(1): 21-25.
- Pigg, S.L. 1995. "Acronyms and Effacement: Traditional Medical Practitioners in International Health Development." *Social Science and Medicine* 41(1):47-68.
- Putney, P.J. and B. Smith. 1989. *The Training and Practice of Traditional Birth Attendants in Guatemala*. A report prepared for the Technologies for Primary Health Care (PRITECH) Project supported by USAID. PN ABF-275.
- Rosenthal, C. 1987. *Santa María de Jesús: Medical Choice in a Highland Guatemalan Town*. Unpublished Dissertation. Department of Anthropology, Harvard University, Cambridge, MA; revised for the Instituto de Nutrición de Centro América y Panamá.
- Safe Motherhood. 1998. *Postpartum Care of the Mother and Newborn: A Practical Guide*. Report of a Technical Working Group. WHO/RHT/MSM/98.3. Geneva, Switzerland: World Health Organization.
- Schieber, B. 1992. *Mortalidad Materna y Peri-neonatal: Una Intervención con Enfoque Especifico*. Areas de Salud de Quetzaltenango, Hospital General de Occidente. Guatemala: Instituto de Nutrición de Centro América y Panama (INCAP).
- Schieber, B. and H. Delgado. 1993. *An Intervention to Reduce Maternal and Neonatal Mortality*. INCAP Publication. M1-003. INCAP/PAHO.
- Stringer, M. 1998. "Issues in Determining and Measuring Adequacy of Prenatal Care." *Journal of Perinatology* 18(1): 68-73.
- Valverde, V., R. Martorell, V. Meja-Piraval, H. Delgado, A. Lechtig, C. Teller, and R. Klein. 1977. "Relationship Between Family Land Availability and Nutritional Status." *Ecology of Food and Nutrition* 10:241-248.
- Walsh, J.A., C.N. Feifer, A.R. Measham, P.J. Gertler. 1993. "Maternal and Prenatal Health." Pp. 363-390 in *Disease Control Priorities in Developing Countries*, edited by D.T. Jamison, W.H. Mosely, A.R. Measham, and J.L. Bobadilla. Oxford: Oxford University Press.
- WHO. 1994. *Essential Newborn Care: Report of a Technical Working Group*. WHO/FRH/MSM/96.13. Geneva, Switzerland: WHO Retrieved 22 March 2000 from the World Wide Web:

- http://www.who.int/rht/documents/MSM96-13/essential_newborn_care.html.
- WHO. 1996. *Care in Normal Birth: A Practical Guide*. Report of a Technical Working Group. Geneva, Switzerland: World Health Organization.
- WHO/FRH/MSM/96.24. . Retrieved 17 February 2000 from the World Wide Web: <http://www.who.int/rht/documents/MSM96-24/msm9624.htm>.
- WHO. 1997. *Coverage of Maternity Care: A Listing of Available Information, Fourth Edition*. Geneva: World Health Organization.
- WHO and UNICEF. 1996. *Revised 1990 Estimates of Maternal Mortality: A New Approach by WHO and UNICEF*. Geneva, Switzerland: World Health Organization.
- Williams, R.J. and D.L. Heymann. 1998. "Containment of Antibiotic Resistance." *Science* 279(5354):1153-1154
- World Bank. 1999. *World Development Indicators, 1999*. Washington, DC: World Bank. Retrieved 24 November 1999 from the World Wide Web: <http://www.worldbank.org/data/wdi/>.

PUBLICATIONS BASED ON THE EGSF

- Pebley, Anne R. and Noreen Goldman. 1997. *The Guatemalan Survey of Family Health, Appendix A: English Questionnaires*. DRU-1538/1-NICHD. Santa Monica, CA: RAND.
- Pebley, Anne R. and Noreen Goldman. 1997. *Encuesta Guatemalteca de Salud Familiar (EGSF), Apéndice B: Cuestionarios en Español*. DRU-1538/2-NICHD. Santa Monica, CA: RAND.
- Peterson, Christine, Noreen Goldman and Anne R. Pebley. 1997. *The 1995 Guatemalan Survey of Family Health (EGSF): Overview and Codebook*. DRU-1538/3-NICHD. Santa Monica, CA: RAND.
- Pebley, Anne R., Noreen Goldman, Hernán L. Delgado, Rafael Flores, Marie T. Ruel and Francisco Chew. 1997. *Informe de la Encuesta Guatemalteca de Salud Familiar*. Publicación INCAP DCE/027. Instituto de Nutrición de Centro América y Panamá.
- Acevedo, Dolores and Elena Hurtado. 1997. Midwives and Formal Care Providers in Prenatal, Delivery and Postpartum Care in Four Communities in Rural Guatemala: Complementarity or Conflict? In Anne R. Pebley and Luis Rosero-Bixby (eds.) *Demographic Diversity and Change in the Central American Isthmus*. Santa Monica, RAND.
- Acevedo, Dolores y Elena Hurtado. 1997. Comadronas y Proveedores Formales en la Atención del Embarazo, Parto, y Postparto en Cuatro Comunidades Rurales de Guatemala. En Luis Rosero Bixby, Anne Pebley and Alicia Bermúdez Méndez (eds.) *De los Mayas a la Planificación Familiar: Demografía del Istmo*. Editorial de la Universidad de Costa Rica.
- Goldman, Noreen, Barbara Vaughan, and Anne R. Pebley. 1998. The Use of Calendars to Measure Child Illness in Health Interview Surveys. *International Journal of Epidemiology* 27:505-512.
- Pebley, Anne R., Elena Hurtado, and Noreen Goldman. 1999. Beliefs about Children's Illness. *Journal of Biosocial Science* 31: 195-219.
- Robles, Arodys and Noreen Goldman. 1999. Can Accurate Data on Birthweight be Obtained from Health Interview Surveys? *International Journal of Epidemiology* 28:925-931.
- Heuveline, Patrick and Noreen Goldman. 2000. A Description of Child Illness and Treatment Behavior in Guatemala. *Social Science and Medicine* 50: 345-364.
- Goldman, Noreen and Patrick Heuveline. 2000. Treatment-Seeking Behavior and Child Illness in Guatemala. *Tropical Medicine and International Health* 5(2): 145-55.

- Glei, Dana and Noreen Goldman. 2000. Understanding Ethnic Variation in Pregnancy-related Behaviors, Health Care and Birth Outcomes in Rural Guatemala. *Ethnicity and Health* 5(1): 5-22.
- Goldman, Noreen, Anne R. Pebley and Megan Beckett. 2001. Diffusion of Ideas about Personal Hygiene and Contamination in Poor Countries: Evidence from Guatemala. *Social Science and Medicine* 52: 53-69.

APPENDIX I

Sampling Design

The sample for the Guatemalan Survey of Family Health (EGSF) was drawn from rural areas of the following four departments: Chimaltenango, Totonicapán, Suchitepéquez and Jalapa.³³ Therefore the results presented in this report apply exclusively to the rural population of these departments.

The sampling plan was based on a target of interviewing approximately 3000 women ages 18 to 35, living in 60 rural communities within the four departments. The sample was selected in two stages. In the first stage, 15 communities were selected in each department. For the sampling frame, rural communities were defined as those containing between 100 and 1800 households (approximately 200 to 10,000 persons). Information on the number of households per community in each of the four departments was obtained from the Instituto Nacional de Estadística (INE) and from the Ministry of Health. Comparisons between the two sources indicated that the latter information was of higher quality, and it was subsequently used to identify the sample of communities in each department.

The list of rural communities in each department was stratified by language. Suchitepéquez and Chimaltenango included a Spanish and an indigenous language (Kaqchikel) stratum. All communities in Totonicapán were indigenous (K'iche), while almost all in Jalapa were Spanish-speaking; the very few indigenous language speaking communities³⁴ in Jalapa were subsequently excluded from the sampling frame. Within each stratum, communities were selected at random, with probabilities proportional to size (number of households) so that the sample would be self-weighting within each department. A total of 25 communities were selected at random within each department, with the last 10 communities serving as back-ups in case any of the first 15 refused to participate in the survey.

Household and Individual Interviews

To solicit cooperation from the selected communities, inform community leaders of the purposes of our investigation, and obtain geographic information regarding the community and access from Guatemala City, members of the survey staff visited each of the 60 selected communities (i.e., the first 15 selected in each department) about six months prior to fieldwork. At this stage, two communities in Totonicapán refused to participate in the survey and were replaced by communities from the alternate list.

The second stage of sampling was the selection of households. Subsequent to the initial visits, staff members revisited each community in order to select the sample of households. With assistance from persons in the community, a detailed map was drawn

³³The sample was restricted to four departments because a national sample would have necessitated the use of more than 21 indigenous languages spoken in Guatemala. We selected these departments with the purpose of including different regions of Guatemala and ethnic heterogeneity in the study.

³⁴The small indigenous population of Jalapa is Poqomam.

(or updated from the most recent map available in the community), indicating the location of all households and other notable structures within the community boundaries. These maps were used in conjunction with preprogrammed hand-held computers to randomly select about 100 households in each community.³⁵ Staff members toured the community, pressing a key on the computer in front of each potential residence. The hand-held computers produced an "included" or "not included" answer for each household on the map, on the basis of preprogrammed information on community size, the desired number of households in the sample, and the number of communities in the sample. Whenever a dwelling was selected, staff members recorded this information (as well as relevant data to assist in re-identifying the dwelling) on the map. This procedure ensured that the sampling teams operated completely independently of the interview teams and thus had no incentive to include or to exclude particular dwellings.

The fieldwork for the survey took place between May and October of 1995. Although each of the 60 communities targeted for the fieldwork had previously agreed to participate in the survey (i.e., the two that had initially refused had been replaced), three communities (two in Chimaltenango and one in Jalapa) refused to participate at the time of the fieldwork. The primary reason for these refusals was fear of the involvement of outsiders, a fear which was associated with the political violence that affected these communities in the 1980s, as well as the occurrence of national elections and negotiations between the government and guerilla groups close to the time of the fieldwork. These three communities were subsequently replaced by communities on the "reserve" sampling list; mapping and sampling operations subsequently took place in these areas.

Each of the approximately 100 selected households in a community was visited and the household roster was administered whenever possible. Interviewers were required to make at least three visits to occupied households (preferably at different times of day) in order to obtain an interview with a household member.³⁶ About 20 percent of households could not be interviewed. Half of these were unoccupied structures, and the other half included households of families that were temporarily absent, households in which no member could answer the survey (e.g., because of illness, mental illness, or insobriety), and those that refused to participate.

All eligible women in these households (women ages 18 to 35 who were living in the household) were identified; about 60 percent of the households had at least one eligible woman. In households with more than one woman between 18 and 35, all were considered eligible. The eligible women were asked to participate in the individual

³⁵Calculations based on the 1987 Demographic and Health Survey indicated that about 100 households per community would be needed in order to obtain interviews with about 50 women ages 18 to 35, because of nonresponse, the presence of unoccupied dwellings, and the age restrictions of the survey. Although 100 was the goal, the actual number of households selected in each community ranged from 92 to 109.

³⁶Although we use the words "dwelling" and "household" interchangeably, interviewers were instructed that some dwellings may contain more than one household and that they should use the concept of persons who "share a cooking pot" to identify a household. If dwellings contained more than one household by this definition, interviewers selected one at random (using the first names of the household heads) for the household interview. If guests or tenants "shared a cooking pot," they were included as household members.

interview, either on the same day or during a later visit. The response rate for these women was 89 percent and ranged from 86 percent in Chimaltenango to 94 percent in Jalapa. The two primary reasons for nonresponse were refusals (39 percent of nonresponse) and inaccessibility (30 percent). The final sample consists of a total of 2,872 women ages 18 to 35, a number close to the initial target of 3,000 women.

Community Interviews

The community interviews consisted of two parts: (1) interviews with three key informants in the community; and (2) interviews with five providers (biomedical and non-biomedical). After arriving in the community for the fieldwork, the field team identified three individuals to serve as key informants. These three persons were chosen according to the following categories: (1) the mayor of the community (or the auxiliary mayor if there was no mayor); (2) a woman who held a leadership position in the community (e.g., head of a cooperative or a social or religious organization); and (3) a person (male or female) who did not hold any leadership position, but knew the community very well.³⁷ The assumption underlying the selection of key informants was that people holding different types of positions in the community were likely to know about different aspects of community life. In order to identify the second type of informant, the team was instructed to talk with the mayor, people in the market and other members of the community. Interviewers were also instructed to ensure that the third type of person did not hold any major post in the community (including school teacher or a staff position at a health center), but rather to identify someone who would know about different aspects of the community as compared with the first two informants; a typical choice for this role was the owner of a small shop or a seller of goods at the local market. The three informants were administered the same questionnaire (during separate interviews), and provided information about the names and locations of all health providers and health installations (hospitals, clinics, health posts and centers and pharmacies) within or near the community center (i.e., within 20 km.) in the last section of the key informant questionnaire.

Subsequent to interviewing the three key informants, the field team compiled responses from the informants' lists of health providers (obtained from the questions described above) and constructed the following three *consolidated* lists (i.e., lists that included any provider's name that appeared on at least one of the three informants' lists of providers): (1) private doctors; (2) midwives (licensed and unlicensed); and (3) other providers (including curers, masseurs, bone setters, herbalists, spiritists, and injectionists, but excluding health promoters, pharmacists and their employees and personnel at the health posts or centers³⁸). Under guidance from the supervisors, the following providers were selected from the consolidated lists (based on alphabetical order of the first names of the providers): one doctor, one midwife, and two other providers. The selected providers were subsequently interviewed with the appropriate questionnaires. Doctors

³⁷ In all but three communities, interviews were carried out with three key informants. One community had two informants and two had four informants, yielding a total of 181 interviews with key informants.

³⁸ In a few communities that had fewer than the required number of providers, pharmacists or health promoters were interviewed.

received one questionnaire while midwives and other providers received a different questionnaire that contains separate subsections for providers who take care of pregnant women and for those who offer other forms of treatment (in some cases, providers offered both types of services and thus answered both sets of questions). The field teams were instructed to use only female interviewers to interview female providers because of the personal nature of the information collected (but they could use either female or male interviewers to interview male providers). Interviewers made at least three visits in an attempt to interview the selected providers. If they could not do so after three visits, supervisors selected an alternative provider (the next in alphabetical order) from the consolidated lists.

In addition to the four provider interviews specified above, the field team interviewed the head of the health post or center that was closest to the community (regardless of distance). If team members could neither locate the head nor make an appointment to see him, they interviewed an assistant. In summary, the field team was responsible for conducting a total of eight community survey interviews in each community, three with key informants and five with providers.

Appendix II

ASK FOR THE LAST LIVE BIRTH (IF BORN SINCE JANUARY '90). FILL IN EACH COLUMN MORE CONTINUING WITH THE NEXT COLUMN.										
NAME OF LAST LIVE BIRTH _____		ORDER (FROM C11a, p. 1012)		(FROM C21a, COL. II, p. 13)		1		3		
ALIVE		DEAD								
Now I would like for us to talk about when you were pregnant with (NAME OF LAST LIVE BIRTH).										
Did you have (CONDITION IN D1 - D5) during your pregnancy?										
	D1 Bleeding/hemorrhage	D2 Convulsions	D3 Swelling of the hands or face	D4 The water broke early	D5 Other serious problems that you suffered during pregnancy (What problem?)	D6 Did you see someone during this pregnancy? IF SO, who? PROBE: midwife, doctor, nurse	D7 CHECK: ANY 'YES' IN D1 - D5 YES 1? NO 3 ? D9a	D8 Did anyone else take care of you or give you advice for these problems? IF SO, who? PROBE: husband, relatives, neighbors	D9 What medicine, home remedies or treatments did you receive or take for these problems? PROBE: take medicine, massage, baths	
	Yes 1 No 3 ? ?	Yes 1 No 3 ? ?	Yes 1 No 3 ? ?	Yes 1 No 3 ? ?	Yes 1 No 3 ? ?	Yes 1 No 3 ? ?	Yes 1 No 3 ? ?	Yes 1 No 3 ? ?	In which month(s) did you take this remedy or do these things?	
	In which month(s) did you have (CONDITION IN D1 - D5)?									
Month of pregnancy	NOTE 'X' IN EACH MONTH WITH PROBLEM		NOTE CODE IN EACH MONTH (UP TO 3 PER MONTH) WITH OTHER PROBLEM		NOTE CODE IN EACH MONTH (UP TO 3 PER MONTH) WITH PROVIDER		NOTE CODE IN EACH MONTH (UP TO 3 PER MONTH) WITH PERSON		TREATMENT	
1										
2										
3										
4										
5										
6										
7										
8										
9										

NAME OF LAST LIVE BIRTH _____		ALIVE1 DEAD3										
D9a	CIRCLE EACH DISTINCT PROVIDER IN D6 NOTE THE NUMBER OF DISTINCT PROVIDERS FROM D6 IF ZERO, SKIP TO ? D23			NO. PROVIDERS FROM D6 IF ZERO, SKIP TO ? D23								
Now I would like for us to talk about each of the people that you saw when you were pregnant with (NAME), beginning with the first person that you saw.												
Did this person that you saw (THINGS IN D13-D17)?												
D10 NOTE THE CODES (FROM D6) FOR EACH DISTINCT PROVIDER (UP TO 4). IN THE ORDER IN WHICH SHE SAW THEM.	D11 Did _____ see you because you were pregnant, or because you had problems with your pregnancy, or both?	D12 What problems did you have?	D13 Check how the baby was in the stomach?	D14 Take your blood pressure?	D15 Take blood?	D16 Give you an injection?	D17 Did he/she give you a prescription, medicine or remedy? IF SO, did you take it?	D18 What else did you do to you? ALL CODES THAT SHE MENTIONS	D19 How many times did you see _____ during this pregnancy?	D20 How did you pay him/her? READ EACH ALTERNATIVE	D21 IF PAID IN MONEY: How much did it cost for you to see him/her? INDICATE IF IT IS PER VISIT, FOR THE ENTIRE PREGNANCY OR FOR PREGNANCY AND DELIVERY	D22 How long did it take to get to _____? (ONLY ONE WAY)
1	Pregnant ? D13 Problems Both		Yes No 1 3	Yes No 1 3	Yes No 1 3	Yes No 1 3	Given and taken Given and not taken Not given			At one time In installments She didn't pay She paid in kind only	1 2 3 8	1 3 He/she comes 4
2	Pregnant ? D13 Problems Both		Yes No 1 3	Yes No 1 3	Yes No 1 3	Yes No 1 3	Given and taken Given and not taken Not given			At one time In installments She didn't pay She paid in kind only	1 2 3 8	1 3 He/she comes 4
3	Pregnant ? D13 Problems Both		Yes No 1 3	Yes No 1 3	Yes No 1 3	Yes No 1 3	Given and taken Given and not taken Not given			At one time In installments She didn't pay She paid in kind only	1 2 3 8	1 3 He/she comes 4
4	Pregnant ? D13 Problems Both		Yes No 1 3	Yes No 1 3	Yes No 1 3	Yes No 1 3	Given and taken Given and not taken Not given			At one time In installments She didn't pay She paid in kind only	1 2 3 8	1 3 He/she comes 4

Table 1.1 Information Collected in the Individual Questionnaire of the EGSF

Section	Information Collected
A. Household and Dwelling	Characteristics of dwelling unit Household possessions Access to water and transportation
B. Background Data	Ethnicity/language Religion Previous residence Age Education/literacy
C. Birth History	Full live birth/child mortality history Current pregnancy status Fetal loss/recent stillbirth history Providers/health care during current and stillbirth pregnancies
D. Prenatal Care/ Assistance at Delivery For 2 most recent live births since 1/90:	Calendar of problems/providers/persons seen/home remedies during pregnancy Detailed data on providers during pregnancy Problems/care at delivery and post-partum Birthweight Neonatal problems/care Immunization Causes of death of infant Breastfeeding/supplementation
E. Child Health For 2 youngest children born since 1/90 living in household:	2-week calendar of diarrhea and resp. symptoms /providers/persons/home remedies Detailed data on providers/persons seen/home remedies Causes of illness General health status
F. Contraceptive Use	Ever and current use of methods
G. Marital History	Marital status Dates of first and most recent union Education/literacy and ethnicity of partner
H. Social Support	Contact with relatives (parents, in-laws, siblings, and siblings-in-law) Assistance received from relatives Decision making with partner Assistance received from partner
J. Health Beliefs	Beliefs about causes/treatment of illness Actual and potential use of different providers/facilities
K. Community Structure	Perceptions of economic status of community Participation of respondent and family members in community activities during past 5 years
L. Economic Situation	Health insurance for household members Respondent and partner work history/earnings for past 2 weeks Economic activities - past year for respondent, partner and other household members Home/land ownership HH consumption of staples (past 7 days) and other expenses (past month and year)
M. Contact Information	Information to assist contacting respondent in case of reinterview
N. Interviewer Notes	Characteristics of dwelling Presence of others during interview Assessment of quality of responses/difficulties encountered

Table 1.2 Summary of Sample Survey Data Collected, EGSE (1995)

Questionnaire	Information Collected	Number of Interviews
Household Roster	Listing of household members, relation to head, age, education	4792
Anthropometry	Height and weight of all children born since 1/90 Height and weight of mother	3270 children 2688 women
Individual Women	See Table 1	2872
Key Informants	Economic activities, wages in agriculture & industry, banking, services, transport, water, sanitation, important events, costs of products, migration, census of providers w/i 20 km.	180
Health Centers and Posts	Types & training of employees, hours, languages, availability of lab and pharmacy, electricity, water & sanitation, types of patients, fees and payment, services provided and cost, referrals by type of illness, supplies & medicines available, earnings	48
Private Doctors	Similar to questionnaire for health centers and posts	27
Other Providers	Type of provider, training, languages, time spent treating, facilities, electricity, water, type of patients, fees & payment, how often list of treatments/care given (for pregnant women and others), frequency with which list of problems is presented, referrals, earnings	169 66 Midwives

Table 1.3 Characteristics of Mothers and Families, by Department

	Total	Jalapa	Suchite- péquez	Chimal- tenango	Totoni- capán
MOTHERS	(n=2,020)	(n=510)	(n=516)	(n=495)	(n=499)
<u>Ethnicity/Language^a</u>					
Ladina (%)	35.0	100.0	28.0	9.3	1.0
Spanish-Speaking Indigenous (%)	51.9	0.0	70.8	83.0	54.9
Non Spanish-Speaking Indigenous (%)	13.1	0.0	1.2	7.7	44.1
Highest Grade Completed (mean)	2.3	2.4	2.6	3.0	1.3
Can Read a Newspaper (%)	58.1	60.0	58.3	71.7	42.3
<u>Most Common Activity in past 2 weeks</u>					
Agriculture (%)	8.9	1.8	4.3	18.4	11.8
Business/Trade (%)	20.6	11.8	10.1	32.1	29.7
Construction/Other (%)	5.5	5.1	4.7	9.9	2.3
Domestic/Unemployed/Student (%)	65.0	81.3	80.9	39.5	56.2
<u>Marital Status</u>					
Married (%)	67.2	57.8	58.4	81.1	72.2
In Consensual Union (%)	25.4	33.9	32.4	11.9	22.7
Separated/Divorced/Widowed (%)	4.8	5.3	6.8	4.3	2.9
Never In Union (%)	2.5	2.9	2.3	2.7	2.2
Has Medical Insurance (%)	4.0	4.9	8.1	2.4	0.4
SPOUSES/PARTNERS	(n=1,852)	(n=468)	(n=468)	(n=452)	(n=464)
<u>Ethnicity/Language^a</u>					
Ladina (%)	34.5	100.0	26.2	9.2	0.9
Spanish-Speaking Indigenous (%)	63.5	0.0	73.1	89.7	93.0
Non Spanish-Speaking Indigenous (%)	2.0	0.0	0.6	1.1	6.1
Highest Grade Completed	3.4	2.8	3.5	4.5	2.6
<u>Most Common Activity in past 2 weeks</u>					
Agriculture (%)	57.1	75.8	54.2	61.6	36.8
Business/Trade (%)	18.3	5.4	14.8	5.6	47.6
Construction/Other (%)	22.0	15.6	29.1	29.7	13.3
Domestic/Unemployed/Student (%)	2.6	3.2	2.0	3.1	2.2
FAMILIES	(n=2,020)	(n=510)	(n=516)	(n=495)	(n=499)
Monthly Per Capita HH Consumption (Q)	23.2	26.0	25.2	21.0	20.4
Monthly Household Consumption (Q)	139.6	150.4	151.3	125.4	130.0
<u>Land Ownership</u>					
None (%)	23.3	17.0	43.3	27.8	3.3
Fewer Than Five Hectares (%)	75.2	78.9	55.6	72.2	95.7
Five or More Hectares (%)	1.5	4.1	1.1	0.0	1.0
Dirt Floor in Home (%)	64.8	75.8	55.0	51.5	77.3
Tap Water (%)	56.9	41.8	45.5	83.6	57.7
Inside Toilet (%)	8.8	9.0	16.3	9.1	0.4
Electricity (%)	51.1	25.9	30.0	85.2	65.3
Car/Truck (%)	7.6	7.4	5.4	11.7	5.8
Telephone (%)	0.4	0.2	0.8	0.2	0.4

^aRespondents in Jalapa were not asked questions about ethnicity or language ability; all were coded as ladino.

Source: Mother interviews in the EGSF (1995).

Table 1.4 Characteristics of Communities^a, by Department

	Total	Jalapa	Suchi- tepéquez	Chimal- tenango	Totoni- capán
<u>Number of Persons Living in the Community</u>					
Less Than 1,000 (%)	27.6	28.6	26.7	46.7	7.1
1,000 to 2,999 (%)	39.7	50.0	40.0	20.0	50.0
3,000 to 10,000 (%)	32.8	21.4	33.3	33.3	42.9
Distance ^b to Guatemala City (in km)	150.4	165.6	155.4	81.9	198.9
Bus Service & Road Open Year-Round (%)	33.3	40.0	33.3	53.3	6.7
Piped Water (%)	76.7	73.3	46.7	100.0	86.7
Sewer System (%)	26.7	26.7	33.3	33.3	13.3
Farming or Raising Animals is a Major Activity ^c (%)	91.7	100.0	73.3	93.3	100.0
Working on Plantations is a Major Activity ^c (%)	15.0	0.0	46.7	13.3	0.0
Making Things for Sale is a Major Activity ^c (%)	11.7	0.0	0.0	26.7	20.0
Working in Factories is a Major Activity ^c (%)	5.0	0.0	6.7	6.7	6.7
Commonly Migrate to Plantations (%)	31.7	33.3	80.0	13.3	0.0
Commonly Migrate to Other Parts Guatemala (%)	26.7	0.0	53.3	20.0	33.3
Commonly Migrate to Other Countries (%)	23.3	20.0	26.7	6.7	40.0
Commonly Receive Remittances (%)	38.9	33.3	64.3	6.7	53.3
Number of Communities	60	15	15	15	15

^aEstimates based on the interviews with key informants are obtained in the following manner. For categorical responses, the value given by a majority of informants was used and if none agreed, the median value (if ordinal measure) or the response of the mayor or person who had lived longest in the community was used.

^bDistances are measured via the most convenient route, not necessarily the shortest one.

^cKey informants were asked what proportion of families in the community perform different types of work activities. If the majority of families participate in the activity, it was coded as a major activity in the community.

Source: Interviews with key informants in the EGSF (1995). Data on the population of the community come from an outside source and distances from municipal capitals to Guatemala City were provided by the Guatemalan *Instituto Geografico Nacional*.

Table 2.1 Availability of Health Care Services Within and Nearby Community, by Department

	Total	Jalapa	Suchi- tepéquez	Chimal- tenango	Totoni- capán
<u>Midwife</u>					
In the community (%)	96.7	100.0	93.3	93.3	100.0
Within 1 hour (%)	100.0	100.0	100.0	100.0	100.0
<u>Health Center or Post</u>					
In the community (%)	41.7	26.7	53.3	60.0	26.7
Within 1 hour (%)	88.3	80.0	93.3	100.0	80.0
<u>Nurse That Serves Pregnant Women^a</u>					
In the community (%)	6.7	13.3	6.7	0.0	6.7
Within 1 hour (%)	8.3	13.3	6.7	0.0	13.3
<u>Doctor That Serves Pregnant Women^a</u>					
In the community (%)	21.7	20.0	26.7	26.7	13.3
Within 1 hour (%)	53.3	60.0	60.0	53.3	40.0
<u>IGSS Clinic</u>					
In the community (%)	1.7	0.0	0.0	6.7	0.0
Within 1 Hour (%)	28.3	13.3	40.0	13.3	46.7
<u>Private Clinic^a</u>					
In the community (%)	26.7	20.0	40.0	26.7	20.0
Within 1 hour (%)	55.0	53.3	66.7	46.7	53.3
<u>Government Hospital</u>					
In the community (%)	0.0	0.0	0.0	0.0	0.0
Within 1 hour (%)	25.0	6.7	26.7	33.3	33.3
<u>Private Hospital</u>					
In the community (%)	5.0	0.0	13.3	6.7	0.0
Within 1 hour (%)	21.7	6.7	26.7	26.7	26.7
<u>Availability of Biomedical Services</u>					
Any biomedical services in community (%)	51.7	33.3	60.0	66.6	46.7
Any biomedical services within 1 hour (%)	91.7	80.0	100.0	100.0	86.7
Number of Communities	60	15	15	15	15

Note: Travel time was estimated as the mean value for the least expensive mode of transport reported. In the case of disagreement regarding the classification of a provider, the least biomedical category was chosen.

^aIn the census, informants were asked to list facilities (including private clinics) and providers (including private doctors and nurses). In many cases, private clinics are staffed by a doctor or nurse so these categories overlap. For example, 30% of communities have a private clinic or a doctor that serves pregnant women.

Source: Census of providers and facilities provided by key informants in the EGSF (1995).

Table 2.2 Cost of Health Care Services Related to Pregnancy

Midwives	(n=66)
Average charged for pregnancy and delivery	Q40
<u>If Patient Has No Money:</u>	
Accepts payment in kind (%)	77.3
Does not charge (%)	4.5
Private Doctors	(n=26)
Average charge for prenatal exam	Q16
Average charge for delivery	Q350
<u>If Patient Has No Money:</u>	
Accepts payment in kind (%)	19.2
Does not charge (%)	57.7

Source: Provider interviews in the EGSF (1995).

Table 2.3 Characteristics of Midwives, by Department

	Total	Jalapa	Suchi- tepéquez	Chimal- tenango	Totoni- capán
Female (%)	97	94	95	100	100
Indigenous (%)	65	0	80	87	100
<u>Language(s)</u>					
Both Spanish and Mayan Language (%)	38	0	58	40	57
Only Mayan (%)	15	0	0	27	43
Only Spanish (%)	46	100	42	33	0
Any Formal Schooling (%)	30	18	40	53	7
<u>How Learned to Attend Pregnant Women</u>					
Experience (%)	38	47	30	33	43
Divine Calling (%)	36	6	50	47	43
Course or Practicum (%)	15	24	15	13	7
Apprenticeship (%)	9	24	5	0	7
<u>Formal Training</u>					
Attended Course for Midwives/Preg/Delivery (%)	76	70	80	60	93
Attended Other Course (%)	15	18	10	33	0
Has Not Attended a Course (%)	9	12	10	7	7
<u>Provider Roles</u>					
Midwife Only (%)	65	35	65	73	93
Midwife/Curer (%)	18	29	20	20	0
Midwife/Curer/Other (%)	8	24	5	0	0
Midwife/Other (%)	9	12	10	7	7
<u>Majority of Clients are:</u>					
Relatives (%)	2	0	5	0	0
Not Relatives (%)	86	94	90	100	57
Half and Half (%)	12	6	5	0	43
Hours Spent Treating Clients in Past 7 Days (mean)	10.2	11.5	13.5	6.2	8.2
Number Deliveries in Past 2 Weeks (mean)	2.2	2.9	1.4	2.5	2.1
<u>Where Midwife Sees Clients</u>					
Midwife's house (%)	29	47	30	20	14
Goes to client's house (%)	52	24	55	47	86
Both (%)	20	29	15	33	0
Has Treatment Room in Home ^a (%)	59	46	56	75	100
Has Electricity in Home ^a (%)	50	23	44	100	50
Has Safe/Piped Water in Home ^a (%)	62	46	56	88	100
Number of Midwives	66	17	20	15	14

^aAmong those midwives (n=32, 48% of all midwives) who have clients come to their home.

Source: Midwife interviews in the EGSF (1995).

Table 2.4 Characteristics of Health Centers and Posts (HCPs)

	All HCPs	Health Posts	Health Centers
<u>Number of Staff</u>			
One (%)	17	35	0
Two or Three (%)	25	48	4
Four to Nine (%)	14	17	12
Ten or More (%)	44	0	84
<u>Have on Staff</u>			
Doctor (%)	50	4	92
Medical Student (%)	29	43	16
Professional Nurse (%)	46	0	88
Any Professional ^a Staff (%)	73	48	96
Any Auxiliary ^a Staff (%)	96	91	100
Inpatient Facilities	12	0	24
Respondent is Female (%)	64	70	60
Any of Prof/Aux Staff Speak a Mayan Language ^b (%)	60	43	79
Any of Prof Staff Speak a Mayan Language ^b (%)	15	0	32
Charge Anything for Prenatal Exams ^c (%)	2	0	4
Offers Delivery Care (%)	29	22	36
IF YES: Charge Anything for Delivery Care (%)	0	0	0
<u>Functioning Equipment/Supplies</u>			
Stethoscope (%)	98	96	100
Fetal Stethoscope (%)	56	56	56
Blood Pressure Cuff (%)	81	83	80
Autoclave (%)	94	91	96
Adult Scale (%)	96	91	100
Baby Scale (%)	90	83	96
Thermometer (%)	98	100	96
Delivery Instruments (%)	62	52	72
Forceps (%)	10	0	20
Vaginal Speculum (%)	90	78	100
Microscope (%)	33	0	64
Antiseptic (%)	92	91	92
Equipment for Transfusions (%)	40	30	48
Gloves (%)	92	100	84
<u>Medicine/Vitamins in Stock Every Week Last Year</u>			
Antibiotics ^d (%)	75	78	72
Analgesics ^e (%)	69	74	64
Iron Supplements (%)	54	56	52
Folic Acid Supplements (%)	33	35	32
Has a Laboratory (%)	29	0	56
Has a Pharmacy (%)	52	52	52
Has Electricity (%)	90	78	100
Has Piped Water (%)	85	74	96
Number of Health Centers and Posts	48	23	25

^aProfessional (prof) staff includes doctors, medical students, and professional nurses. Auxiliary (aux) staff includes auxiliary nurses and rural health technicians.

^bBased only on health centers and posts outside of Jalapa. Health centers and posts in Jalapa were not asked questions about ethnicity or language ability.

^cCharge is 25 centavos.

^dIncludes only those antibiotics important for maternal health care (i.e. trimethoprim-sulfamethoxazole, ampicillin, and penicillin--procaine and benzathine).

^eIncludes aspirin, acetaminophen (tylenol), and ibuprofen.

Source: Interviews with personnel at health centers and posts in the EGSF (1995).

Table 2.5 Characteristics of Private Doctors Who Offer Prenatal/Maternity Care

<u>Department</u>	
Jalapa (%)	46
Suchitepéquez (%)	19
Chimaltenango (%)	19
Totonicapán (%)	15
<u>Number of Doctors in Clinic</u>	
One (%)	92
Two (%)	8
<u>Number of Other Staff</u>	
Zero (%)	38
One (%)	35
Two (%)	15
Three or More (%)	12
Female (%)	4
Indigenous ^a	21
Speaks a Mayan Language ^a	50
<u>Functioning Equipment/Supplies</u>	
Stethoscope (%)	96
Fetal Stethoscope (%)	73
Blood Pressure Cuff (%)	96
Autoclave (%)	50
Adult Scale (%)	92
Baby Scale (%)	50
Thermometer (%)	100
Delivery Instruments (%)	62
Forceps (%)	4
Vaginal Speculum (%)	96
Microscope (%)	15
Antiseptic (%)	100
Equipment for Transfusions (%)	42
Gloves (%)	100
<u>Medicine/Vitamins in Stock Every Week Last Year</u>	
Antibiotics ^b (%)	35
Analgesics ^c (%)	31
Iron Supplements (%)	27
Folic Acid Supplements (%)	31
Has Electricity (%)	100
Has Piped Water (%)	96
<u>Number of Doctors</u>	
	26

^aAmong doctors outside of Jalapa (n=14).

^bIncludes only those antibiotics important for maternal health care (i.e. trimethoprim-sulfamethoxazole, ampicillin, and penicillin--procaine and benzathine).

^cIncludes aspirin, acetaminophen (tylenol), and ibuprofen.

Source: Private doctor interviews in the EGSF (1995).

Table 3.1 Characteristics of Care During Pregnancy, Delivery, and Postpartum Period, by Department

	Total	Jalapa	Suchi- tepéquez	Chimal- tenango	Totoni- capán
Providers Seen During Pregnancy					
No provider	4.2	6.1	4.0	2.3	4.3
<u>Traditional Only</u>					
Midwife (%)	56.3	38.5	59.2	56.2	71.4
<u>Combined Care</u>					
Midwife & HCP (%)	18.6	24.6	13.5	23.0	13.3
Midwife & Doctor (%)	7.8	6.7	9.5	8.2	6.9
Midwife, HCP, and Doctor (%)	1.7	2.4	0.7	2.8	1.1
<u>Biomedical Only</u>					
HCP (%)	5.3	11.6	4.2	3.2	2.1
Doctor (%)	5.5	8.7	8.1	4.1	1.0
Doctor and HCP (%)	0.6	1.4	0.8	0.2	0.0
Place of Delivery					
Home (%)	85.4	80.6	80.6	85.8	94.6
Hospital/Clinic/HCP (%)	14.3	18.8	19.0	14.1	5.4
Other ^a (%)	0.3	0.6	0.4	0.1	0.0
Birth Attendant					
Midwife (%)	80.9	73.1	77.2	83.5	89.9
Doctor (%)	11.1	13.3	15.7	11.2	4.5
Nurse (%)	3.5	5.0	4.8	3.2	0.8
HCP Staff (%)	0.9	1.0	1.1	1.2	0.2
Other/No Attendant (%)	3.6	7.6	1.3	0.8	4.5
Providers Mother Saw Postpartum					
No Provider ^f	28.9	25.8	26.9	16.5	46.3
<u>Traditional Only</u>					
Midwife (%)	59.3	55.0	61.5	70.8	50.2
<u>Combined Care</u>					
Midwife & HCP (%)	0.6	0.7	0.2	1.1	0.2
Midwife & Doctor (%)	0.6	0.6	0.5	1.1	0.4
<u>Biomedical Only</u>					
HCP (%)	1.9	1.7	3.2	1.6	1.1
Doctor (%)	8.7	16.1	7.7	9.0	1.8
Doctor and HCP (%)	0.0	0.1	0.0	0.0	0.0
Providers Baby Saw Postpartum					
No Provider ^f	28.4	23.0	24.2	21.2	45.0
<u>Traditional Only</u>					
Midwife (%)	55.1	53.6	58.8	60.2	47.8
<u>Combined Care</u>					
Midwife & HCP (%)	1.2	1.9	0.8	1.9	0.1
Midwife & Doctor (%)	0.7	1.1	0.8	0.7	0.0
<u>Biomedical Only</u>					
HCP (%)	4.5	3.1	6.2	4.2	4.3
Doctor (%)	10.1	17.1	9.0	11.7	2.7
Doctor and HCP (%)	0.1	0.2	0.1	0.1	0.0
Number of births	3,350	841	836	831	842

Note: Nurses are included with doctors in categories of care.

HCP = Health center or post

^aThis category includes nine births which occurred in a pharmacy, in the car, in the fields, on the road, at Mexican Social Security, or some other unspecified location.

Source: Mother interviews in the EGSF (1995).

Table 3.2 Characteristics of Care During Pregnancy, Delivery, and Postpartum Period, by Ethnicity/Language of Mother

	Total	Ladina	Indigenous	
			Speaks Spanish	Does Not Speak Spanish
Providers Seen During Pregnancy				
No provider	4.2	5.4	3.5	2.4
<u>Traditional Only</u>				
Midwife (%)	56.3	38.7	61.2	82.4
<u>Combined Care</u>				
Midwife & HCP (%)	18.6	22.2	17.9	13.0
Midwife & Doctor (%)	7.8	8.6	8.7	2.0
Midwife, HCP, and Doctor (%)	1.7	2.2	1.8	0.2
<u>Biomedical Only</u>				
HCP (%)	5.3	11.0	3.0	0.0
Doctor (%)	5.5	10.6	3.6	0.0
Doctor and HCP (%)	0.6	1.3	0.3	0.0
Place of Delivery				
Home (%)	85.4	75.4	89.0	97.6
Hospital/Clinic/HCP (%)	14.3	24.0	10.9	2.4
Other ^a (%)	0.3	0.6	0.1	0.0
Birth Attendant				
Midwife (%)	80.9	68.8	85.9	93.4
Doctor (%)	11.1	18.8	8.3	2.4
Nurse (%)	3.5	5.1	3.2	0.0
HCP Staff (%)	0.9	1.2	0.7	0.2
Other/No Attendant (%)	3.6	6.0	1.8	4.0
Providers Mother Saw Postpartum				
No Provider ^c	28.9	25.6	27.6	40.9
<u>Traditional Only</u>				
Midwife (%)	59.3	53.4	63.9	58.0
<u>Combined Care</u>				
Midwife & HCP (%)	0.6	0.7	0.6	0.2
Midwife & Doctor (%)	0.6	0.8	0.7	0.0
<u>Biomedical Only</u>				
HCP (%)	1.9	2.4	2.0	0.4
Doctor (%)	8.7	17.0	5.3	0.4
Doctor and HCP (%)	0.0	0.1	0.0	0.0
Providers Baby Saw Postpartum				
No Provider ^c	28.4	22.5	28.5	41.4
<u>Traditional Only</u>				
Midwife (%)	55.1	51.7	57.8	54.4
<u>Combined Care</u>				
Midwife & HCP (%)	1.2	1.6	1.2	0.2
Midwife & Doctor (%)	0.7	1.2	0.5	0.0
<u>Biomedical Only</u>				
HCP (%)	4.5	4.2	5.0	2.9
Doctor (%)	10.1	18.5	7.0	1.1
Doctor and HCP (%)	0.1	0.3	0.1	0.0
Number of births	3,350	1,128	1,751	455

HCP = Health center or post

^aThis category includes nine births which occurred in a pharmacy, in the car, in the fields, on the road, at Mexican Social Security, or some other unspecified location.

Note: Nurses are included with doctors in categories of care.

Source: Mother interviews in the EGSF (1995).

Table 3.3 Timing and Frequency of Prenatal Visits Among Women Who Saw a Provider During Pregnancy, by Department and Ethnicity/Language of Mother

	Total	Department			
		Jalapa	Suchitepéquez	Chimaltenango	Totonicapán
Timing of First Prenatal Visit					
Within first 4 months (%)	53.5	71.6	62.5	44.6	35.6
5 th to 7 th month (%)	39.0	26.1	32.8	47.5	49.4
8 th month or later (%)	7.5	2.3	4.7	7.9	15.0
Number of Prenatal Visits					
Fewer than 4 visits (%)	14.1	13.3	12.5	12.3	18.3
4 to 6 visits (%)	34.0	28.8	35.2	33.4	38.7
7 to 10 visits (%)	33.0	37.7	36.3	30.3	27.5
More than 10 visits (%)	18.9	20.2	16.1	24.0	15.5
Mean Number of Prenatal Visits	7.8	8.0	7.4	8.5	7.1
Number of Births	3,210	790	802	812	806

	Ethnicity/Language of Mother		
	Indigenous		
	Ladina	Speaks Spanish	Does Not Speak Spanish
Timing of First Prenatal Visit			
Within first 4 months (%)	73.3	47.3	28.8
5 th to 7 th month (%)	24.4	45.0	52.0
8 th month or later (%)	2.3	7.8	19.1
Number of Prenatal Visits			
Fewer than 4 visits (%)	12.4	14.7	16.1
4 to 6 visits (%)	27.9	36.5	39.7
7 to 10 visits (%)	40.0	29.6	28.4
More than 10 visits (%)	19.6	19.2	15.8
Mean Number of Prenatal Visits	8.0	7.7	7.4
Number of Births	1,067	1,690	444

Source: Mother interviews in the EGSF (1995).

Table 3.4 Timing and Frequency of Visits to Providers During Pregnancy, by Combination of Providers Seen

Among Those Who Saw a Provider During Pregnancy	Traditional		Combined Care		Biomedical		
	Midwife Only	Midwife & HCP	Midwife & HCP & Doctor	Midwife & Doctor	HCP Only	Doctor & HCP	Doctor Only
Timing of 1st Visit							
Within first 4 months (%)	40.4	69.3	84.5	75.1	65.2	90.5	77.6
5 th to 7 th month (%)	48.4	28.6	13.8	23.8	30.9	9.5	19.7
8 th month or later (%)	11.2	2.1	1.7	1.2	3.9	0.0	2.7
Mean Number of Visits:							
Midwife	6.6	6.4	5.8	6.0	na	na	na
HCP	na	4.5	3.8	na	5.4	4.2	na
Doctor	na	na	3.9	4.0	na	4.2	6.3
All Providers ^a	7.8	10.9	13.6	10.0	5.4	8.5	6.3
Number of Births	3,210	1,886	623	58	261	178	21

Note: Nurses are included with doctors in categories of care.

HCP = Health center or post

na = Not Applicable

^aIncludes visits to "other" providers.

Source: Mother interviews in the EGSF (1995).

Table 3.5 Number of Distinct Providers Seen Among Women Who Saw a Provider During Pregnancy, by Combination of Providers Seen and Ethnicity/Language of Mother

	Combination of Providers Seen					
	Traditional	Combined Care			Biomedical	
	Midwife Only	Midwife & HCP	Midwife & HCP & Doctor	Midwife & Doctor	HCP Only	Doctor & HCP Only
Total						
Number of Births	1,886	623	58	261	178	21
na = Not Applicable						
Number of Distinct Providers Seen						
One (%)	97.0	na	na	na	98.9	na
Two (%)	2.8	95.5	na	87.7	1.1	76.2
Three (%)	0.2	4.3	86.2	10.7	0.0	23.8
Four or Five (%)	0.0	0.2	13.8	1.5	0.0	0.0

	Ethnicity/Language of Mother		
	Indigenous		
	Ladina	Speak Spanish	Does Not Speak Spanish
Number of Distinct Providers Seen			
One (%)	59.2	67.8	83.1
Two (%)	35.2	28.3	16.0
Three (%)	4.9	3.4	0.9
Four or Five (%)	0.8	0.4	0.0
Number of Births	1,067	1,690	444

Note: Nurses are included with doctors in categories of care.

HCP = Health center or post

Source: Mother interviews in the EGSF (1995).

Table 4.1 Percentage of Pregnancies With Serious Complications During Pregnancy and Delivery

	Percent
During pregnancy:	
Hemorrhage/bleeding	3.1
Convulsions	0.9
Swelling of the hands or face	2.1
Water broke early	2.3
Any of these four complications	7.6
Other serious problems	
Pain or cramps in the stomach/back/head	5.7
Swelling of other parts	2.7
Nausea/vomiting/lack of appetite	2.2
Threat of miscarriage	1.1
Baby in a bad position	1.1
Infection	1.0
Pain or cramps in the legs/feet	1.0
Weakness/fatigue	0.8
Dizziness/fainting	0.7
High fever/fever	0.5
Other problem	4.1
Any complication	21.7
During the birth:	
Baby was in a bad position	5.1
Had convulsions	1.1
Number of Births	3,350

Source: Mother interviews in the EGSF (1995).

Table 4.2 Frequency With Which Midwife Encountered Various Complications

	Percent Distribution			
	Never	Almost Never	Some- times	Often
How often have the following things occurred to women who you were taking care of?				
Hemorrhage/bleeding during pregnancy	56	21	23	0
Swelling of the hands and face during pregnancy	79	11	8	3
Fever during pregnancy	61	12	27	0
Anemia during pregnancy	42	23	27	8
Woman had seizures or attacks	85	11	3	2
Baby in lateral or bad position	27	29	38	6
Water broke too early	59	23	17	2
Woman fainted during pregnancy	65	24	11	0
Woman's vagina ripped during the delivery	89	8	3	0
Twins or triplets	35	30	35	0
Much loss of blood after delivery	65	21	9	4
Woman had a high fever and chills after delivery	48	27	23	2
Number of Midwives	66			

Source: Midwife interviews in the EGSF (1995).

**Table 4.3 Frequency of Cesarean Delivery,
by Selected Characteristics of the Mother**

	Percent
Cesarean Delivery	4.3
By Age of Mother at Birth	
Less than 20 years	4.6
20 to 24 years	4.4
25 to 29 years	3.6
30 to 35 years	4.9
By Department	
Jalapa	5.1
Suchitepéquez	5.7
Chimaltenango	4.3
Tonicapán	1.9
By Ethnicity/Language of Mother	
Ladina	6.7
Spanish-speaking indigenous	3.3
Non-Spanish-speaking indigenous	1.8
Number of Births	3,350

Source: Mother interviews in the EGSF (1995).

Table 5.1 Referrals by Midwives to Other Providers During Pregnancy and Delivery, by Department

	Total	Jalapa	Suchitepéquez	Chimaltenango	Totonicapán
How Often Refers to a Biomedical Provider					
Always (%)	24	47	5	27	21
Frequently (%)	8	6	20	0	0
Sometimes (%)	42	47	40	47	36
Almost Never (%)	6	0	5	20	0
Never (%)	20	0	30	7	43
For Problems During Pregnancy, Ever Refers Women to:					
Any Provider ^a (%)	80	100	70	93	57
Hospital (%)	27	24	30	33	21
Health Center or Post (%)	64	94	35	73	57
Private Doctor (%)	24	24	40	20	7
Another Midwife (%)	5	6	10	0	0
For Problems During Delivery, Ever Refers Women to:					
Any Provider ^a (%)	77	100	65	93	50
Hospital (%)	53	59	50	60	43
Health Center or Post (%)	26	53	5	40	7
Private Doctor (%)	9	6	20	7	0
Number of Midwives	66	17	20	15	14

^aThis category includes any referral to a provider, regardless of type. Because midwives may refer to more than one type of provider, the sum of percentages for individual providers may be greater than the percentage referring to any provider.

Source: Midwife interviews in the EGSF (1995).

Table 5.2 Whether Midwife Regularly Refers, by Characteristics of Midwife and Community

	Percent of Midwives that Regularly Refer
Total	32
<u>Attended Formal Midwife Training</u>	
No	12
Yes	38
<u>Midwife Has Any Formal Education</u>	
No	33
Yes	30
<u>Ethnicity of Midwife</u>	
Ladina	52
Indigenous	21
<u>Any Biomedical Services Available in the Community</u>	
No	31
Yes	32
<u>Average Per Capita Monthly Household Consumption</u>	
Less than 25 quetzales	27
25 quetzales or more	38
<u>Bus Transportation Available and Road Open Year-Round</u>	
No	25
Yes	45
<hr/>	
Number of Midwives	66

Note: Regularly is defined as "always" or "frequently".

Source: Midwife, key informant, and mother interviews in the EGSF (1995).

Table 5.3 Odds Ratios from Logit Regression Model Predicting Likelihood that Midwife Regularly Refers Clients to a Biomedical Provider

Variable	Odds Ratio	P value
Trained Midwife	23.33*	0.01
Any Formal Education	1.01	0.99
Indigenous	0.06*	0.03
Bus Transportation Available and Principal Road Open Year-Round	3.79	0.13
Any Biomedical Services in the Community	1.60	0.54
Average Per Capita Household Consumption in the Community	0.91	0.21
<i>(Jalapa)^a</i>		
Suchitepéquez	1.08	0.95
Chimaltenango	1.08	0.95
Totonicapán	1.45	0.80
<hr/>		
Number of Midwives	66	

* $p < 0.05$

^aOmitted category

Table 5.4 General Referrals by Biomedical Providers to Other Providers, by Department

	Health Centers and Posts (HCP)				
	Total	Jalapa	Suchitepéquez	Chimaltenango	Totonicapán
Refer to:					
Hospital (%)	100	100	100	100	100
Health Center (%)	65	100	56	80	57
Private Doctor (%)	19	38	21	17	7
Midwife (%)	21	38	14	0	36
Number of HCPs	48	8	14	12	14

^aComputed only among health posts (n=23).

Source: Interviews with personnel at health centers and posts in the EGSF (1995).

	Private Doctors				
	Total	Jalapa	Suchitepéquez	Chimaltenango	Totonicapán
Refer to:					
Hospital (%)	100	100	100	100	100
Health Center or Post (%)	42	50	40	20	50
Private Doctor (%)	73	75	80	80	50
Midwife (%)	12	25	0	0	0
Number of Private Doctors	26	12	5	5	4

Source: Private doctor interviews in the EGSF (1995).

Table 6.1 Provider Distribution, by Motivation for Seeking Care

	Reason Saw Provider:		
	Because Pregnant	For a Problem	For Both Reasons
Type of Provider (% distribution)			
Midwife	70.6	35.1	46.3
Health Center or Post	19.6	30.2	23.2
Nurse	1.1	2.4	2.5
Doctor	8.7	32.3	28.1
Number of Providers	3,705	248	406

Source: Mother interviews in the EGSF (1995).

Table 6.2 Distribution of Problems for Which Woman Saw a Provider, by Type of Provider

	Total	Midwives	HCP	Doctors
Problems^a Cited:				
Pain/cramps in stomach/back/head/arms/legs/feet	31.5	37.8	37.2	17.0
Malpresentation	13.6	20.4	11.2	6.7
Swelling other than hands or face	10.4	11.6	10.0	8.2
Nausea/vomiting/lack of appetite	9.8	7.6	14.2	9.8
Threat of miscarriage	8.6	7.3	7.1	11.8
Infection/high fever	8.1	2.9	8.3	15.5
Symptoms of preeclampsia/eclampsia ^b	7.2	5.4	7.1	9.8
Hemorrhage	6.9	5.4	4.7	11.3
Other problem	25.8	18.2	28.4	34.0
Number of Providers	654	275	169	194

Note: This table is based only on providers that were seen because the woman had a problem during pregnancy, with one observation for each provider seen. Percentages within a column may sum to more than 100% because women may have reported more than one problem.

HCP = Health center or post

^aAll problems that accounted for at least five percent of the total are coded separately.

^bSymptoms include: high blood pressure, swelling of the hands or face, and convulsions.

Source: Mother interviews in the EGSF (1995).

Table 6.3 Midwives' Reports of Treatments and Practices During Pregnancy and Delivery

How often the midwife does the following:	Percent Distribution			
	Normally	Once in a while	Only When Necessary	Never
Examine position of the baby	94	4	0	2
Give advice about food	97	0	0	3
Give abdominal massage during pregnancy	51	4	17	27
Give other massage during pregnancy	17	9	17	58
Try to change the position of the baby	20	9	42	29
Take woman's pulse or blood pressure	26	3	0	71
Do a vaginal exam	38	8	18	36
Say a special prayer for the mother's health	85	2	0	14
Conduct a religious/spiritual ceremony	21	6	3	70
Push on the stomach at the beginning of birth	23	3	12	62
Clean the baby after birth	100	0	0	0
Keep the baby warm after birth	89	2	2	8
Discourage immediate breastfeeding ^a	3	0	2	95
Encourage immediate breastfeeding ^a	97	2	0	2
Put powders/ointments on the umbilical cord	50	0	4	46
Prepare a sweatbath after birth	35	0	5	60
Bind the mother's stomach	85	6	5	4
Tell mother to give baby sugar water first week	65	9	5	21
Tell mother to give baby chicory/anise tea first week	51	6	11	32
Recommend immunize children ^a	98	0	0	2
Recommend not immunize children ^a	4	0	0	96
Check on the woman during the 40 days after birth	71	3	6	20
Check on the baby during the 40 days after birth	74	2	3	21
How often the midwife gives the following:	Almost Always	Generally	Sometimes	Never
Herbs or herb teas	21	29	21	29
Vitamins	20	21	11	48
- Injections of vitamins	11	12	6	71
Aspirin	2	2	3	94
Antibiotics	0	0	4	96
Other medicine: Analgesic ^b	8	6	9	77
Injections of medicine	2	3	6	89
Injections against tetanus	4	5	0	91
Injections to speed delivery	4	2	5	89
Injections to alleviate delivery pains	2	2	9	88
Other medicine during delivery ^c	2	6	3	89
Number of Midwives	66			

^aSome questions were asked twice, once in a positive manner and once in a negative manner in order to examine both encouragement and discouragement of these practices.

^bIncludes: acción, acetaminophen (Tylenol), cibalgina, espasmopin/espasmosibalgina, "gotas maravillosas", neomelubrina for fever, darviran, and pepper cooked with "gotas maravillosas".

^cIncludes: delivery pills and injection of methergine, an oxytocic administered after delivery to prevent and control hemorrhage.

Source: Midwife interviews in the EGSF (1995).

Table 6.4 The Most Important Component of a Midwife's Care

	N
Please tell me your opinion: what is the most important thing (which should be done) in taking care of a woman during pregnancy and delivery?	
Eat Well (e.g., <i>alimentarse, buena alimentación</i>)	27
Hygiene/Cleanliness (e.g., <i>higiene, hacerle su limpieza para que no haya infecciones, aseo personal, bañarse</i>)	17
Don't Lift Heavy Things or do Things that Require a lot of Strength (e.g., <i>no levantar cosas pesadas, no hacer mucha fuerza, no carguen al niño chiquito durante el embarazo</i>)	14
Take Care/Watch Over (e.g., <i>velar por el estado de salud de la mujer y el niño, el cuidado de la mujer durante el embarazo, cuidarse</i>)	6
Prenatal Care (i.e., <i>el control, este en control, control embarazo</i>)	5
Make Sure Baby in a Good Position (e.g., <i>que el bebe venga en buena posición, ver la posición del bebe</i>)	5
Careful of Falling (e.g., <i>tener cuidado con las caídas, cuidarse en los caminos con hoyos</i>)	3
Take Vitamins, Medicines, or Remedies (e.g., <i>tomen las medicinas o remedios, tomar vitaminas</i>)	2
Entrust God/Ask for God's help (e.g., <i>pedirle a dios que le de fuerza, encomendarse a dios</i>)	2
Exercise (e.g., <i>hacer ejercicios</i>)	2
See Doctor/Health Center (e.g., <i>sus visitas al centro de salud, esten en control con medico</i>)	2
Other ^a	6
Nothing/No answer	2
Total Number of Midwives	66

Note: All responses that were cited by more than one midwife are reported separately (categories are not mutually exclusive).

^aOther includes: take a sweatbath ("banarse en temascal"), encourage women to keep their spirits up ("animar a las señoras para que esten preparadas"), don't ride a horse ("no anden en caballo"), don't get depressed ("no se deprimas"), don't jump ("no brinquen"), and take care not to get wet ("cuidarse de mojarse").

Source: Midwife interviews in the EGSF (1995).

**Table 6.5 Mother's Report of Provider Practices During Pregnancy,
by Type of Provider**

	Type of Prenatal Provider		
	Doctor	Health Center or Post	Midwife
Total	(n=517)	(n=895)	(n=2,890)
Checked the position of the baby (%)	98.2	94.6	98.7
Took blood pressure (%)	96.7	87.0	32.2
Took blood (%)	27.1	16.4	0.6
Gave an injection (%)	30.4	55.1	8.0
Gave a prescription/medicine/remedy (%)	84.5	76.3	19.5
Jalapa	(n=178)	(n=346)	(n=623)
Checked the position of the baby (%)	98.3	90.2	98.7
Took blood pressure (%)	96.1	84.7	17.0
Took blood (%)	29.8	20.2	1.1
Gave an injection (%)	31.0	70.5	3.2
Gave a prescription/medicine/remedy (%)	86.5	70.2	28.9
Suchitépéquez	(n=148)	(n=162)	(n=710)
Checked the position of the baby (%)	98.6	98.8	98.9
Took blood pressure (%)	98.6	87.6	24.9
Took blood (%)	31.1	13.0	0.4
Gave an injection (%)	21.6	35.8	3.7
Gave a prescription/medicine/remedy (%)	87.2	85.2	17.7
Chimaltenango	(n=129)	(n=246)	(n=770)
Checked the position of the baby (%)	97.7	97.6	99.2
Took blood pressure (%)	93.8	86.6	44.7
Took blood (%)	24.0	17.9	0.4
Gave an injection (%)	30.2	42.7	16.4
Gave a prescription/medicine/remedy (%)	75.2	74.0	14.3
Totonicapán	(n=62)	(n=141)	(n=787)
Checked the position of the baby (%)	98.4	95.7	98.0
Took blood pressure (%)	100.0	92.9	38.6
Took blood (%)	16.1	8.5	0.5
Gave an injection (%)	50.0	61.0	7.4
Gave a prescription/medicine/remedy (%)	91.9	85.1	18.7

Source: Mother interviews in the EGSF (1995).

Table 6.6 Injection During Delivery, by Birth Attendant and Department

	Birth Attendant		
	Doctor	Nurse	Midwife
Total	(n=369)	(n=113)	(n=2,706)
Received an injection (%)	63.7	44.2	17.9
Purpose of the injection ^a			
To deliver more quickly (%)	17.9	22.1	14.7
To reduce the pain (%)	20.9	6.2	1.5
For another purpose ^b (%)	10.8	7.1	0.7
Do not know purpose (%)	15.4	10.6	1.0
Jalapa	(n=111)	(n=40)	(n=615)
Received an injection (%)	73.0	42.5	6.3
Purpose of the injection ^a			
To deliver more quickly (%)	14.4	17.5	4.7
To reduce the pain (%)	26.1	2.5	1.0
For another purpose ^b (%)	18.9	12.5	0.5
Do not know purpose (%)	13.5	10.0	0.3
Suchitepéquez	(n=130)	(n=39)	(n=645)
Received an injection (%)	64.6	30.8	17.0
Purpose of the injection ^a			
To deliver more quickly (%)	17.7	25.6	12.1
To reduce the pain (%)	20.0	2.6	1.4
For another purpose ^b (%)	8.5	5.1	1.1
Do not know purpose (%)	18.5	0.0	2.5
Chimaltenango	(n=90)	(n=27)	(n=692)
Received an injection (%)	52.2	59.2	25.9
Purpose of the injection ^a			
To deliver more quickly (%)	20.0	14.8	21.0
To reduce the pain (%)	13.3	14.8	2.7
For another purpose ^b (%)	6.7	3.7	1.4
Do not know purpose (%)	14.4	25.9	0.7
Totonicapán	(n=38)	(n=7)	(n=754)
Received an injection (%)	60.5	71.4	20.8
Purpose of the injection ^a			
To deliver more quickly (%)	23.7	57.1	19.5
To reduce the pain (%)	26.3	14.3	0.8
For another purpose ^b (%)	5.3	0.0	0.0
Do not know purpose (%)	13.2	14.3	0.7

^aThe respondent was allowed to report more than one purpose of the injection.

^bBecause of the way the question is asked—"Did they give you any injection when you gave birth?"—the injection may have actually been given after the birth of the baby to minimize postpartum blood loss.

Source: Mother interviews in the EGSF (1995).

Table 7.1 Frequency of Harmful Midwife Practices, by Department

	Total	Jalapa	Suchite- péquez	Chimal- tenango	Totoni- capán
Ever Give Injection to Speed Delivery (%)	12.1	0.0	20.0	20.0	7.1
Ever Give Antibiotics (%)	4.5	0.0	10.0	0.0	7.1
Ever Put Powder or Ointment on the Umbilical Cord (%)	54.5	70.6	55.0	20.0	71.4
Normally Push on Stomach at Beginning of Delivery (%)	23.1	31.2	40.0	0.0	14.3
Normally Perform Vaginal Exam (%)	37.9	17.6	50.0	46.7	35.7
Normally Tell Mother to Give Baby Sugar Water/Tea During the 1 st Week of Life (%)	75.8	88.2	95.0	46.7	64.3
Do Not Normally Keep the Baby Warm After Birth (%)	10.6	11.8	25.0	0.0	0.0
Do Not Normally Encourage Immediate Breastfeeding (%)	3.0	0.0	0.0	0.0	14.3
Do Not Normally Encourage Immunization of Children (%)	1.5	0.0	0.0	6.7	0.0
Do Not Normally Check Mother and Baby in the 40 Days After Birth (%)	32.3	11.8	15.0	100.0	14.3
Number of Midwives	66	17	20	15	14

Source: Midwife interviews in the EGSF (1995).

Table 7.2 Mean Score on Quality of Care Index^a, by Selected Covariates

	Mean Score on Index
Total	2.61
<u>Attended Formal Midwife Training</u>	
No	2.69
Yes	2.58
<u>Midwife Has Any Formal Education</u>	
No	2.67
Yes	2.47
<u>Ethnicity of Midwife</u>	
Ladina	2.36
Indigenous	2.74
<u>Any Biomedical Services Available in the Community</u>	
No	2.87
Yes	2.36
<u>Average per capita monthly household consumption</u>	
Less than 25 quetzales	2.65
25 quetzales or more	2.56
<u>Department</u>	
Jalapa	2.44
Suchitepéquez	3.10
Chimaltenango	2.43
Tonicapán	2.28
Number of Midwives	64 ^b

^aA high score on this index indicates greater use of harmful practices.

^bTwo midwives have missing values on the index.

Table 7.3 Coefficients from Linear Regression Model Predicting Score on Quality of Care Index^a

Variable	Coefficient	P value
Intercept	1.61	
Trained Midwife	-0.27	0.46
Any Formal Education	-0.43	0.23
Indigenous	1.13*	0.04
Any Biomedical Services in the Community	-0.74*	0.03
Average Per Capita HH Consumption in the Community (Jalapa) ^b	0.05	0.13
Suchitepéquez	0.13	0.82
Chimaltenango	-0.31	0.64
Totonicapán	-0.83	0.23
Number of Midwives		64 ^c
R ²		0.22

* p < 0.05

^aA high score on this index indicates greater use of harmful practices.

^bOmitted category

^cTwo midwives have missing values on the index.

Figure 1.1 Map of Guatemala Indicating Departments Included in EGSF

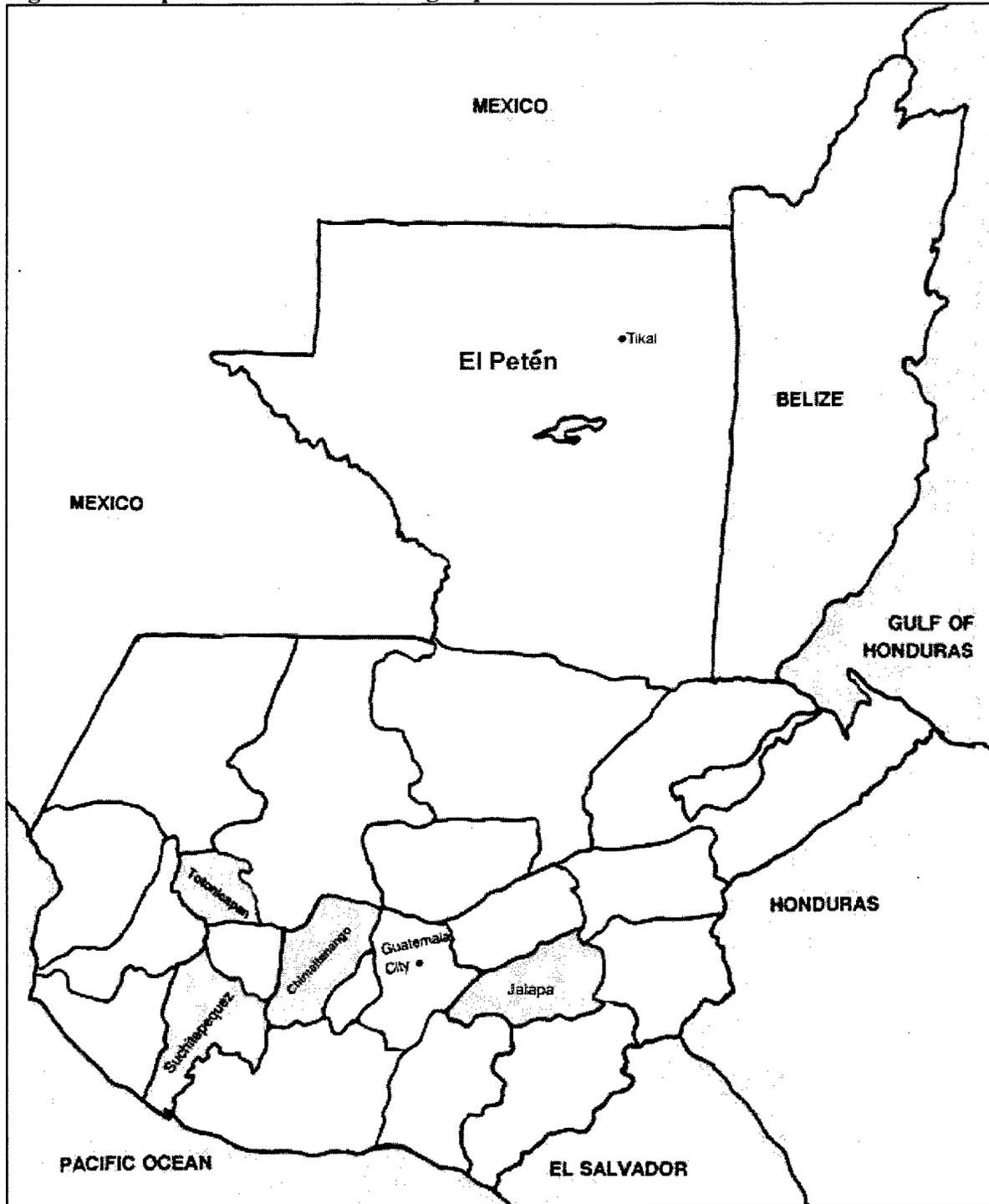
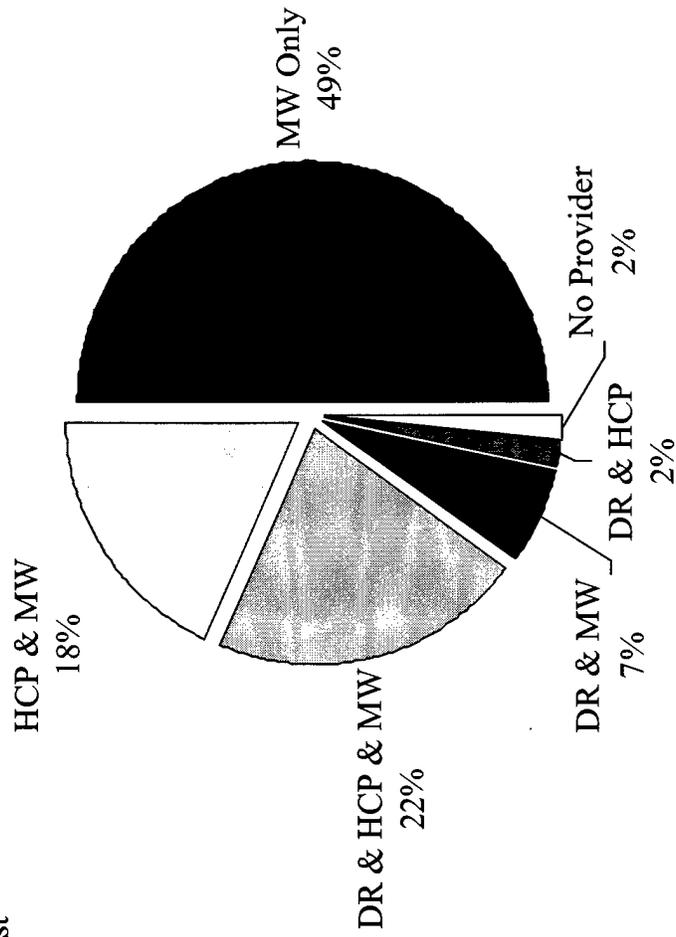


Figure 2.1 Combination of Providers Offering Pregnancy Care in the Community

DR = Doctor/Private Clinic
HCP = Health Center or Post
MW = Midwife



Source: Census of Providers provided by key informants in the 1995 EGSF.

Figure 7.1 Distribution of Quality of Care Index

