

**PERINATAL MORTALITY IN GUATEMALA**

**Community Study**

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**Guatemala, August, 1999**

*“When I was pregnant, I was always sick, I couldn’t sit or walk, as soon as I made an effort, my daughter, the older one, stopped me from walking, when I was five months pregnant I got a fever and my husband went to buy my medicine and I took it, that helped me and he bought injections and they were given to me, I had burning in my chest and what I would do was get a glass of water with a spoonful of baking soda and that helped a lot. When I started labor pains I felt cold, then I ran a fever and it took three days to deliver and I pushed for a long time, I think that the death of my baby is because it took me so long with labor and I pushed for a long time I think that my baby died because my labor took so long and I pushed so hard, so that my baby was already tired, but when I couldn’t give birth, the midwife ripped me hard in the stomach so that I would give birth, maybe in part this is what did it to my son because his little head was sunk as if it were something soft, one pushes with a finger and the impression of the finger stays there, that’s how my baby’s head was, or maybe it was because I have already had a lot of children, but since I cut my own firewood maybe it was that also, everything together and I really don’t know what the cause of death of my son was...” (Ofelia, 37 years old; Momostenango)*

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## **ABBREVIATIONS**

**LAC - LATIN AMERICA AND THE CARIBBEAN**

**INCAP - NUTRITION INSTITUTE FOR CENTRAL AMERICA AND PANAMA**

**INE - NATIONAL STATISTICS INSTITUTE**

**WHO - WORLD HEALTH ORGANIZATION**

**USAID - U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT**

## CHAPTER I. INTRODUCTION

### A. BACKGROUND AND JUSTIFICATION

Every year, world-wide, almost four million deaths take place during the neonatal period, i.e., from birth to day 28 of life. Out of this total, between 50 and 60% occur during the first week of life.<sup>1</sup> According to WHO data, 7.3 million of perinatal deaths take place annually, 300,000 of them in developed countries. The remaining 7 million deaths occur in lesser developed countries, of which it is estimated that between 40 and 50% occur during the first seven days of life.<sup>2</sup>

Approximately 98% of the perinatal deaths--defined by the World Health Organization (WHO) as the period between week 22 of the pregnancy to day 7 of life of the newborn, with a birth weight of 500 or more grams, or length of 25 or more centimeters <sup>3</sup>--occur in developing countries. It is estimated that the average perinatal mortality rate is 57 per 1000 live births. The region contributing to the greatest number of deaths is Central and South Asia, totaling almost one third of all perinatal deaths. Another third takes place in Africa. In the region of Latin America and the Caribbean (LAC) the perinatal mortality rate is slightly under 40 per 1000 live births. Even though the greatest absolute number of neonatal deaths occur in areas outside LAC, the proportion, and consequently, the importance of perinatal mortality, from the public health viewpoint, is high. At the world level, close to 5 million newborns died in 1995 during the first month of life in developing countries, <sup>4</sup> of which approximately 3.2 million, died during the first week of life.<sup>2</sup> In the LAC region, the proportion of neonatal mortality as part of infant mortality varies between 58% or more in countries such as Paraguay, Argentina and Chile, to 45% in countries such as Guatemala, Brazil and Bolivia. In general, the lower the infant mortality, the higher the proportion of the neonatal death rate.<sup>5</sup>

Infant mortality in Guatemala in 1996 was reported at 57 per 1000 live births, it being one of the highest in Latin America.<sup>6</sup> Perinatal deaths in Guatemala have not been fully documented and the information available is based on estimates. The perinatal death rate, according to WHO, is 45 per 1000 births.<sup>3</sup> For purposes of this study and for operative reasons, we accepted WHO's definition of the perinatal period as being from week 28 of gestation until day seven after birth or a birth weight of 1000 grams or more.

In general, in developing countries, there is very little information on the causes and factors associated with perinatal mortality. This is also true for Guatemala, although there are some studies that approach maternal and infant mortality from a health and anthropological viewpoint. These studies have served as a frame of reference for the design and development of the present study, which, for the first time, attempts to approach perinatal mortality from a community perspective. The data obtained from the 1986 census of indigenous [Indian] residents of the highlands indicate the magnitude of the problem: 50% of deaths of children under 3 years of age were intra-partum or neonatal, representing 60% of all deaths of children under 5 years of age. In reviewing civil registration records (1981-85) it was found

that 4% of all births reported died intra-partum and 2.3% of the newborns died during the first month of life. Data from INCAP on the Indian community of Santa María Cauqué show that 4% of pregnancies ended with stillborns and 3.7% of live births died during the first month of life.<sup>7</sup>

A study carried out in an Indian community in Guatemala, describes the risk factors associated with intra-partum or neonatal death as: illiteracy of the mother, nullipara mother, short intergenetic interval, and the use of traditional providers instead of health services. This same study suggests that the use of oxytocin and multiple vaginal examinations during labor are associated with an increase of perinatal mortality.<sup>7</sup>

In evaluating intra-partum and neonatal mortality (Schieber et al (1994)) in a case and control study, was found that the greatest contributing factors to neonatal deaths in the rural areas of Guatemala were premature birth, abnormal position, and prolonged labor.<sup>8,9</sup> As to intra-partum deaths, it was found that these were due mainly to asphyxia or intra-partum trauma.<sup>7</sup> Vaginal hemorrhage or bleeding is a symptom related to maternal and perinatal death, <sup>2,10,11</sup> which has also been identified as the principal cause of maternal mortality in the Indian population of Guatemala (1986).<sup>12</sup> In the area of Quetzaltenango, a conglomerate study indicated that 19% of all the pregnancies/newborns had complications, of which 6% occurred during pregnancy, 8% at delivery and 4% in the post-partum period. The complications in newborns occurred at the rate of 1 in 10, the most frequent being low birth weight, prematurity, asphyxia, neonatal sepsis, respiratory infection and tetanus.<sup>9</sup>

Care at delivery, according to studies in Guatemala and other countries, is one of the principal determining factors in perinatal death. This is evident if one keeps in mind that approximately 65% of all deliveries in the rural area of Guatemala occur at home, assisted mostly by traditional midwives and in some cases family members, the father, or neighbors.<sup>5</sup> The lack of knowledge and training, at this level of care, makes it difficult to ensure an adequate management of the pregnancy and birth and an early recognition of the dangers of death to the newborn or the baby before it is born. Therefore, the rural, predominantly Indian communities, have a greater risk of a high perinatal or neonatal death rate. Due to the characteristics of this high-risk population (social, cultural and economic characteristics), the modification of the risk factors and conducts related to pregnancy and delivery are more complex.

It is believed that, in general, the use of health services by the rural population will depend on the availability of both traditional as well as formal services, as well as access to these. As to delivery, it seems that there is also a feeling in the community about where delivery takes place: it is an intimate process, without the interference of others who are not part of the community.<sup>13</sup> This might explain the preference for births to take place at home, with a midwife, which is reflected in national statistics <sup>6</sup> and which has also been observed in other countries.<sup>2</sup>

The traditional concept and practice of birth care in Guatemala contrasts with the practices proposed by Western medicine in health services, prenatal clinics and training programs for midwives, based on the biomedical delivery model.<sup>14</sup> It incorporates a more integral view of women, closely related to



their environment: cold-warm balance, equilibrium of her social relations and emotional state.<sup>13,14</sup> Traditional health beliefs of the Indian population may play an important role in the selection of services related to pregnancy,<sup>15</sup> with more frequent use of services offered by midwives, because they provide something that the formal services do not, which are valued by the mothers, such as, among others, *temascal* baths and massages.<sup>8</sup>

This study will approach perinatal mortality, from the community standpoint, in four Indian communities. Aside from establishing a presumptive diagnosis of perinatal death, it will focus particularly on “social diagnosis” of the occurrence of death. This includes the identification of some problem or complication during pregnancy, delivery or live birth, the management at home of such complications, the patterns for seeking help and the different determining factors of the actions taken by the mother or her family.

The MotherCare Project carries out its intervention activities in six Departments [States]: Sololá, San Marcos, Quetzaltenango, Totonicapán, Retalhuleu and Suchitepéquez. However, the Project has placed greater emphasis on the four communities included in this study, and has implemented complete intervention packages there. One of the joint efforts with the community has been the establishment of Community Maternity Clinics, which at present are operating in two of the four communities of the study (Momostenango and San Carlos Sija). Through the Community Maternity clinics the concern for the high intra-partum mortality rate suffered by these communities has been revealed. That is why these communities have been selected as sites for this study. Another element for the selection of these communities has been that the development of this study requires the active participation of the community for the identification of cases. The fact that there is a Community Maternity Committee will also make it possible to disseminate the results at the community level, since their possible participation will be considered for vigilance of future perinatal deaths, which can be carried out jointly by these communities.

On the basis of municipal records in these four communities in 1996, intra-partum and neonatal death rates are 63.7 per 1000 live births in Momostenango and 33 per 1000 live births in San Carlos Sija. Nahualá and Comitancillo have a rate of 49.5 and 46.5 per 1000 live births, respectively. It is believed that the high perinatal death rates are a result of a vicious circle resulting from scarcity of resources, evidenced by a poor nutritional state of the mother, insufficient preventions of complications during pregnancy, inadequate diagnosis and treatment of sexually transmitted diseases in areas of high prevalence, and scarce delivery care by qualified personnel. Fetal and perinatal death (newborns during the first week of life) not only lead to maternal health deterioration, but also constitute a probability for a new pregnancy. It is believed that many of the interventions to reduce perinatal mortality are simple and cost-effective, and that they also greatly reduce maternal mortality and morbidity. It is likely that close to 50% of the 4.3 million fetal deaths estimated per year are a direct consequence of mishandled deliveries, as is also the case with millions of neonatal deaths.<sup>6</sup> The magnitude of maternal mortality and disability resulting from this, has not been fully recognized and is underestimated in many countries. Available perinatal mortality figures are based on estimates, due to the frequent under-reporting of these deaths. Perinatal health does not only reflect on maternal health,

but also on the quality of health services, this being a determining factor for the health and well-being of the individual during the rest of her life.<sup>2</sup>

This emphasizes the need to study in greater detail the principal determining factors and causes of perinatal death, in order to propose intervention alternatives that are feasible and useful, where the participation of the community is considered to be an integral part of it.

## **B. STATE OF HEALTH IN GUATEMALA**

### **1. Infant and Perinatal Health**

According to estimates available from WHO <sup>16</sup> on infant mortality in the region of the Americas for the five-year period of 1990-1995, approximately 600 thousand children die annually before the age of 5. Most of these deaths occur before the age of 1, concentrated in countries with more than 10,000 births per year.

Infant mortality is one of the public health priorities for most of the countries, as it is for the Ministry of Health in Guatemala. Perinatal and neonatal mortality rates are closely related, representing an equally serious problem, and which are used as indirect health and development indicators, especially in international comparisons. They provide indirect information on the education, health and social systems of a country, as well as of the level of nutrition, medical development, especially in the fields of obstetrics and neonatology. Therefore, they reflect on the development of pediatric and obstetric care, as well as on the effectiveness of social measures in general and public health measures in particular.

Perinatal mortality, according to WHO, is defined as deaths occurring in the period between week 22 of the pregnancy and day 7 of the birth of the baby and a weight of 500 mg. or 25 centimeters or more of length, although for purposes of this study, the cut-off point has been 28 weeks of gestation according to the previously mentioned definition of the perinatal period determined by WHO. The causes and determining factors of perinatal death represent a biological continuum with the mother, since they are very similar, notwithstanding whether they occur before, during or shortly after delivery. In principle, perinatal mortality does not distinguish between stillborns and live births who die during the first week of life, and is therefore a useful way to measure reproductive losses for purposes of comparisons between regions of a country or between one country and another.<sup>3</sup>

Perinatal death rates are slightly below 40 per 1000 in Latin America, and in the Caribbean the figures are slightly higher. The estimated rate for Guatemala is slightly higher according to WHO, 45 per 1000 births. Although it has not been possible to demonstrate a causal relationship between perinatal mortality and care by a qualified health provider during delivery, it is observed that the regions where deliveries are not attended by qualified personnel tend to show a higher perinatal mortality rate.<sup>2,3</sup>

## 2. Sources of Information on Infant and Perinatal Mortality Rates in Guatemala

In most countries there is more information available on infant mortality than on perinatal mortality rates. Guatemala does have some information from other sources, which as a whole, has made it possible not only to estimate perinatal mortality, 3 but also to indicate its causes and problems.

Official sources reflecting perinatal mortality rates include the *Encuesta Nacional de Salud Materno Infantil de 1987 y 1999 de Guatemala* [National Survey of Mother and Infant Health in Guatemala for 1987 and 1999], sources of data published by the United Nations (Demographic Yearbook, ed 1974-76-81-84-92), WHO: Statistical Data: Perinatal Mortality, Global Epidemiological Surveillance and Global Situation Assessment, 1986 and the *Anuario Estadístico de 1986 del Instituto Nacional de Estadística* [Statistics Yearbook for 1986 of the National Statistics Institute].

Since the 1980's, a series of studies have been made, which delve deeper into the principal causes of perinatal mortality in the communities of Guatemala, both from the medical as well as sociological and anthropological viewpoints, 7,8,12,14,15,17,19,20 which have served as a frame of reference for the purposes of this study, for the comparison of results.

## 3. Perinatal Health Interventions in Guatemala

### 3.1 Training of Midwives

After recognizing the importance of midwives as health providers, in 1970 WHO started to encourage the formal recognition of midwives by health services, as well as initiating training courses, an idea which was supported at the Alma Ata Conference (1978). At the 1987 conference in Nairobi (Safe Motherhood), it was stated that no maternal health program could work adequately if it didn't have the nexus of population-midwife-health services, the key being the training of midwives.14 This decision was based on the fact that many areas do not have sufficient numbers of health professionals or resources to cover these needs. At present, midwives in many countries and regions, are the persons who cover this vacuum of care, as well as being culturally accepted by the communities where they work.21

In Guatemala, as in other Central American countries, midwives care for most of the deliveries at the rural level: 7 of every 10 deliveries, and in some rural areas the rate may be as high as 9 of every 10 deliveries, with a low coverage by formal services.7 According to national figures, 65% of births occur at home, 55% of the deliveries are cared for by midwives, a percentage that rises to 69% in the South-Western area of the country {where the study was carried out). Doctors or nurses care for only 31 and 3% of deliveries at the national level, respectively, a figure which goes down to 19% and 5% in the South-Western area of the country.5

Since 1935, the Government of Guatemala has been making efforts to include midwives in health

services, introducing regulations to this end in 1953. Training programs, which use different methodologies, have been carried out at the national level since 1955.<sup>14,18</sup> In 1980, the Ministry of Health of Guatemala adopted the model recommended by WHO: a formal recognition of midwives, establishing a registration system, granting them licenses, and carrying out training courses and indicating that part of the work of the midwives is to promote the use of contraceptive methods. The health personnel strives to win over midwives who traditionally work in an empirical fashion in their communities, although at times the isolation of the towns and their difficult access, hinder their identification. <sup>14</sup> Training lasts for 15 days, and in general is taught by a nurse who has had at least one year of formal nursing training, after that, monthly meetings are held with midwives. <sup>18,22</sup>

The relationship between the two systems is not devoid of conflict, since the **medicalization** of the midwives practices is sought, which at times goes beyond their traditional practices, without having evaluated the benefits or weaknesses of many of these practices.<sup>14</sup> There could be cases of a mix of practices that are not only traditional, but which also incorporate formal treatments, such as antibiotic pills, injections, or referrals of complicated cases to a medical provider. While the formal medical system seems to be more closed to traditional concepts, traditional medicine is much more open to new concepts and procedures.<sup>13</sup>

The predominant role of the midwife in providing care during pregnancy, delivery and the newborn, underlines the importance of her being incorporated in maternal-infant health interventions, which must include the identification and modification of high risk practices, improve her capability for identifying complications, and referrals of high risk pregnancies, prevention and early detection of neonatal diseases.<sup>7</sup> According to data from the Pan American Health Organization, 1990, the Government of Guatemala has resources to cover only 20% of obstetric hospital care for its population.<sup>22</sup> From experience gathered in other developing countries, it has been observed that improving facilities and the reorientation and mobilization of health personnel is not sufficient to induce the general public to modify its traditional beliefs and practices.<sup>11,23</sup> In spite of the fact that the effectiveness of training of midwives and its impact on maternal and neonatal mortality rates has been questioned, <sup>24</sup> midwives are and will continue to be the key providers of maternal care.<sup>18</sup>

### **3.2 Activities Carried out by the MotherCare Project**

#### **3.2.1 Information, Education and Communication (IEC)**

The MotherCare Project, together with the Ministry of Health, has implemented an intervention that includes closer contact of communities with health services and, as of 1995, the technical reinforcement of the staff of such centers and posts and Departmental hospitals for resolving problems. This intervention includes a strong component of Information, Education and Communication (IEC) toward the community through qualitative diagnoses, radio announcements, printed materials, etc. This intervention is being implemented In the four communities included in this study.

### **3.2.2 Training of Midwives**

In the South-Western region of the country, from 1995 to 1997, the MotherCare Project has trained midwives, through a methodology that focuses on adults and is more participatory, in order for the midwives to identify obstetric danger situations (premature birth, prolonged labor, abnormal position, retention of placenta and infections of the mother and the newborn). A total of 3,450 midwives have been trained and it is estimated that in the area of intervention, 100% of the midwives have been trained. In evaluating the training, through the use of some control communities (no training), it was determined that the midwives still have difficulties in correctly identifying the principal complications of pregnancy and delivery. Perinatal mortality of women sent to hospitals by the midwives, was not reduced significantly, 25 especially those referred to due to prolonged labor, apparently because the referral was late, due to the midwife or family members.24

### **3.2.3 Training of Hospital Health Staff**

Health personnel, doctors and nurses, in six hospitals included in the study area, have been trained in the management of the principal obstetric and perinatal emergencies.24,25 The training program included sensitivity awareness of the health personnel, in order to attain a more understanding and supportive attitude toward midwives who refer the patient and the newborn.24,26 This sensitivity awareness process was incorporated in order to make the services more acceptable from a cultural perspective. In the evaluation it was determined that the change of attitude of the hospital staff has had a favorable effect on timely referrals of obstetric patients.23 The approach of the hospital toward the community, its projection beyond the hospital walls, is considered to be an essential part of the improvement of their quality.27 It is considered to be an effective means of allowing and increasing access to a health service (hospital) that is well equipped, capable of providing quality care, which includes adequate inter-personal communication of providers towards the users of such services.21

### **3.2.4 Community Maternity Committees**

As a result of the community mobilization promoted by the MotherCare Project, local committees have been established since 1995, with the participation of representatives of the health center, community leaders and representatives of the municipal government. Each committee has the objective of establishing a community maternity clinic, where midwives of the community can provide care for births without complications, and refer complications to the referral hospitals. At this time, five community maternity clinics have been established and are operating, two of them in communities included in this study: Momostenango and San Carlos Sija.

### **3.3 Maternal Mortality Analysis Committees**

By initiative of the *Programa Materno Infantil del Ministerio de Salud* [Maternal-Infant Program of the Ministry of Health], since 1997, the formation of a committee including health staff, doctors and nurses of the hospitals and health areas was implemented. Such a committee is operating in each Department [State], including the communities of this study. These committees meet monthly to discuss the cases of maternal death that have occurred during that month. In each case they analyze and define immediate actions to be taken, agreeing on strategies which each service must implement according to its level of responsibility.

## **C. PURPOSES OF THE STUDY**

### **1. Objectives**

1. To identify the principal causes of perinatal mortality in the community
2. To identify omissions in the “Road to Survival” model during pregnancy, delivery and in live births resulting in deaths.
3. To identify the components of a proposed intervention that includes different options.

### **2. Goals**

1. To disseminate the results of the study, to the health staff and planners at the central and local levels of the Ministry of Health.
2. To raise the sensitivity awareness of the people, through Mortality Committees which have already been established, on the problems of perinatal mortality and to consider alternative actions.
3. To identify different options for action and intervention in order to reduce perinatal mortality rates, with the participation of the Ministry of Health and the community.

## **D. COLLABORATION BETWEEN THE MINISTRY OF HEALTH OF GUATEMALA, MOTHERCARE AND BASICS**

A great number of infant deaths are concentrated in perinatal and neonatal mortality rates.. The investigation of its causes and principal determining factors are ever more necessary, due to the lack of information available in Guatemala and in other countries with high maternal- infant mortality rates, and the growing need of identifying interventions that can reduce this mortality rate. Once this has been identified as the most important problem by the Ministry of Health of Guatemala, BASICS and

MotherCare have agreed, in close collaboration with the Ministry of Health, to carry out a study on community perinatal mortality in the area where MotherCare was carrying out activities related to maternal-infant health.

The experiences and needs in maternal-infant health and specifically with infant mortality carried out by the two agencies, are complementary of each other, and establish the proper framework for the development of this research.

Once the research project was developed by MotherCare and BASICS, it was presented to officials of the Ministry of Health, who reviewed the protocol, and made some important comments. At the time of its implementation, the Ministry of Health played a more active role, since one of its representatives became part of the Steering Committee. This person was aware of the development of the project, the principal problems that arose, and also collaborated in their solution.

Once the study was finalized and the preliminary results were made available, two meetings were held with the Ministry of Health. The data obtained was reviewed, and the contributions and comments of the Ministry of Health were included in the final report.

## CHAPTER II. METHODS

### A. INTRODUCTION

Up to now, perinatal mortality has been studied, mostly from the clinical and hospital aspect, complemented by studies that approach the problems of pregnancy, delivery and care in the rural and Indian population, from a socio-anthropological viewpoint. 7,8,12,14,15,17,19,20 In order to gain a better understanding of the principal determining factors of perinatal mortality and to be able to identify interventions tending to diminish same, the Ministry of Health, BASICS and MotherCare agreed to carry out a study at the community level, in four communities where the MotherCare Project had been operating in activities related to maternal-health: Momostenango in Totonicapán, Comitancillo in San Marcos, Nahualá in Sololá and San Carlos Sija in Quetzaltenango.

The method used in this study for obtaining information at the community level on prenatal mortality is called “Verbal Autopsy” and “Social Autopsy”. This methodology, through the use of a questionnaire, applied to mothers of stillborns or babies who died during the first week of life, allows us to identify the possible causes of death, as well as the principal determining factors of conducts and actions taken by the mothers during the pregnancy, delivery and with the newborn. The questionnaire model was designed jointly by the Johns Hopkins University, the BASICS Project and MotherCare, adapted later to the characteristics of the population included in the study; through the results of the ethnographic study, the definition of indicators and the variables of the study, ending with the final version during the training of surveyors and finally its testing in the field.

The study is not probabilistic; it is observational and descriptive. Due to the difficulty of carrying out a sampling of this population and the low number of estimated deaths that might be found in this fashion, it was decided to include all cases of perinatal death identified in a 6-month period (December 1997 to May 1998) in the four communities included in the study, making sure that the mothers are residents of said communities. The inclusion of cases was made retrospectively (from December 1997 to February 1998) and prospectively (from March to May, 1998), since the collection of data was started in March, 1998, for four months. In order to identify all cases of perinatal deaths, a mortality vigilance network was established, which included the municipality, hospitals, health centers and posts, midwives, assistant mayors and members of the community.

Once the cause of perinatal death was identified, an interview was held, usually with the mother, and if possible, with another person who had been present at delivery. The interviewees were told the objective of the study, they were advised that participation was voluntary, and they were assured of the confidentiality of the data obtained. On the basis of an instruction manual for the questionnaire, the surveyors carried out the interviews, tape recording the open sections. This recording was later transcribed and translated faithfully to Spanish by the surveyors themselves. Once the questionnaires were completed, they were reviewed by the field coordinator and analyzed by the panel of experts. As a result of this analysis, the probable cause of death of each of the cases included was determined.



The data base was designed in the EPIINFO 6 statistical program, with double entry of data. The analysis of the data was also done in EPIINFO 6.

## **B. MORTALITY STUDIES**

### **1. Verbal Autopsies**

The method used in this study to obtain information at the community level on the principal causes and determining factors of perinatal death is called “Verbal Autopsy” and “Social Autopsy”. These tools allow for the identification of the principal causes of death, aside from the principal determining factors of the conduct and patterns of seeking assistance for mothers during pregnancy, delivery and the newborn who died during the first 7 days of life.

The verbal autopsies have been used in many studies as useful tools to determine the cause of death in areas where mortality records and causes are deficient 28,29 and a higher rate of deaths occur at home. 30,31,32 With regard to perinatal mortality, most of the deaths occur during delivery, which generally takes place at home and without contact with a formal health service.32 Therefore, this methodology has been recommended by WHO in order to identify possible causes of death in children under 5 years of age, 28,29 mothers, 10,33 and adults in countries or regions where maternal-infant death rates continue to be an important public health problem. It contains elements associated with epidemiology and ethnography, and is a useful tool for the understanding of the process of seeking help from the interviewee’s standpoint; in general, the person in charge of caring for the deceased. 31,34 The process of seeking help can be described from the time the illness is detected until death, which includes treatment at home and the health providers who have been consulted. 2,31,35 More recently, this methodology has been used to identify problems in the health care systems where intervention could be provided. 31

Verbal autopsy is applied to the person in charge of the deceased, usually the mother. The causes of death determined by this method are only presumptive, since they are based on the recollection of the principal signs or symptoms by the interviewee. These “cardinal” signs and symptoms are asked systematically of the interviewee, delving more deeply into those identified by her as having been present during the episode of the illness that led to death. A series of validation studies have been made of the signs and symptoms, where signs and symptoms mentioned by the interviewee are compared to medical records, finding that there has been a great variation between their sensitivity and specificity. In a given illness, the more specific a sign or symptom, the greater the sensitivity and specificity, 29,39,3,36 even though variations may occur, depending on the place or country, 29,37 but diagnostic certainty will not only depend on the recognition of signs and symptoms by the interviewee but also on the severity of the illness and its prevalence in the community. 29 In order to arrive at a presumptive diagnosis of death, a series of diagnostic algorithms have been developed, which have been validated in various places, which allow for a comparison between countries or regions. 38 Another option is to have these data analyzed by a group of expert, which makes the diagnoses obtained not comparable with other countries or

regions, because they include personal opinions.<sup>37</sup> The diagnostic algorithms developed by the panel of experts on perinatal mortality are listed in Appendix 1.

There are validation studies, especially related to infant and maternal mortality. <sup>10</sup> Little has been done on adult mortality. Some studies have been conducted on some illnesses which cause neonatal death, such as neonatal tetanus, asphyxia, low birth weight, among others. <sup>39</sup> However, the fact that signs and symptoms of perinatal death have been included and diagnostic algorithms have been developed, has not as yet been considered by any other study, which makes it necessary that they be validated in future studies and experiences, and that a critical analysis of these be made, to establish the advantage of using this type of methodology in order to establish the cause of perinatal death and the principal determining factors based on the Road to Survival model.

The appropriate length of time between the occurrence of death and the interview with the person in charge of caring for the deceased has been discussed in several studies. <sup>37,38</sup> In general, it is recommended that interviews not be done close to the time of death, preferably between 15 days and three to six months later. Some sources even believe that the symptoms and signs of the illness leading to death and the principal actions taken, can be remembered even one year after death. <sup>31,36,37</sup> In this study, the maximum time of recollection was three months. The accuracy of the memory of the caregiver as to when help was sought during the illness, as well as the treatments provided at home and by the health staff consulted, has not yet been determined.

## **2. The Road to Survival**

Maternal-infant health is still a public health priority in most of the developing countries, due to the high number of deaths and disabilities it produces. Perinatal death at the world level and for the Americas occupies the seventh place in cause of death, according to estimates by WHO in 1998 <sup>40</sup> The trend of maternal-infant mortality rates during the last 30 years has clearly gone down, in spite of the fact that some socio-economic and demographic indicators in developing countries have not improved accordingly (birth rates, economic situation, `emergence of new diseases, etc.). There is no doubt that technological advances and development of health systems have contributed significantly to this decrease, although estimates for the year 2020 by the World Bank do not indicate significant changes when compared to the present situation. <sup>42</sup>

Technological advances, the proven effectiveness of most of the treatments for maternal-infant diseases which cause the greatest [statistical] weight of illness, its growing availability in the countries and the development of health systems, together with the experiences obtained in programs such as Respiratory Infections or Acute Diarrhea Disease, have underlined the importance of attaining an approach to two specific groups of people in charge of the care of the child or the mother, who are: 1) the mother, the father, another member of the family or of the community, <sup>41,43</sup> and 2) the health professionals. <sup>41</sup>

The process of seeking help is an important part of infant mortality. If it were possible to have a better

knowledge and understanding of this process, for infant survival, its importance in public health and planning programs would be much clearer. Experience gained through health interventions centering exclusively on health systems has proven to be only relatively successful. 25 Health planners are ever more conscious of the value of knowledge of cultural patterns of the communities where they work, through different programs. There is a greater recognition of many of the public health problems which are due to lack of knowledge regarding health practices and conducts, and a lack of sensitivity toward economic and cultural factors. 25,44,45,46

In order to determine the way in which the community and the health services are inter-related, BASICS, together with the Center for Disease Control and Prevention and the U.S. Agency for International Development, have developed a conceptual model: The Road to Survival, which can be used as a reference by local or national authorities in the development of interventions tending to reduce perinatal and infant mortality. (See Chart on next page).

## ROAD TO SURVIVAL

1  
Welfare  
Health

2  
Illness

3  
Caregiver  
Recognizes  
Illness

4  
Caregiver  
Provides  
Quality Treatment  
At Home

8  
Caregiver  
Continues to  
Provide Quality  
Treatment

11  
Improvement  
Of Health

At Home

-----  
Away from Home

Informal Community  
Service Midwife

5  
Caregiver  
Seeks Help  
Away from  
Home

6  
Formal Health Services  
Public / Private

7  
Health Provider  
Provides Quality  
Treatment

9  
Caregiver  
Accepts  
Referral

Referral Service

10  
Health Provider  
Provides Quality  
Treatment

\*Problems during pregnancy,  
delivery and with the newborn

There are two critical points in the Road to Survival. The first is the ability to describe and follow the process at the time the illness occurred until the moment when the child died. The second is that the different boxes of the model can be quantified.

Before the illness appears, we have Box 2, where the child/mother enjoys well-being and health, in this context defined as the absence of any perceived illness. The preventive health activities are addressed to this group, such as prenatal control for pregnant women, immunization with anti-tetanus vaccine for the protection of the baby and the mother, etc. Once the mother or the newborn get sick (Box 2), the signs and symptoms of the illness may be perceived by the mother, family member or caregiver (Box 3). Once the illness has been identified, the caregiver will take action--in order to do so, she must determine whether the illness is mild or severe. She must proceed to provide quality treatment at home, when the illness is not serious, since in many cases the mere fact that treatment is provided at home may produce an improvement and well-being. However, it has been observed that inappropriate treatment administered at home may be related to mortality. 28,35,44,46,47,48 Other factors, such as the health system, the community, and the individual, may contribute to the recovery from the illness. 41,49,50

At times, the child or the mother display a serious illness requiring specialized treatment. In this case, the caregiver must be able to recognize the severity of the illness and must seek help outside the home, where she generally has several options: from a traditional faith healer, a midwife, a health center or post, or a hospital, among others.. The timely identification of the severity is of vital importance when seeking early help.

The seeking of help by the caregiver (Box 5) depends on a complex network of factors which must be identified and understood by the persons in charge of providing assistance and by public health programs, in order to make it possible for the caregiver to make the right decisions for the treatment of the sick child or mother. The decision about which provider to go to, may be based on factors such as distance, cost, prior experience with different health providers, cultural factors, or a combination of all of these, among others. 41,46 The mother's beliefs about the causes of the illness have been considered as important determining factors not only for the treatment provided at home, but also on the decision of which health provider should be consulted, and possible changes of providers during the episode of the illness. 16,46,51,52,53

The mother or the person in charge of caring for the mother or the child may turn to an informal health service, such as a midwife, or to formal health services such as health centers or posts, to a private physician, the community maternity clinic, etc. (Box 6). This box includes any health service sought out without referrals. During the episode of the illness leading to the death of the baby, the mother or caregiver may alternate the use of different providers available. Each provider, at the time of consultation, must provide quality treatment (Box 7). The definition of whether the treatment provided is or is not of quality, is usually based on guidelines of national managements or protocols established by

the World Health Organization. Quality ambulatory treatment includes, to a great extent, the fact that the medicine prescribed is indicated for the illness, that the recommendations given to the mother or caregiver are relevant, with an explanation of which danger signs require her to immediately return to the consultation and date at which she must return for follow-up consultations. Thus, the caregiver may continue to provide quality treatment at home (Box 8).

If it is a serious illness, the health provider must refer the mother or the newborn to a higher care level (Box 9). But it is not enough for the health provider to refer the mother or the baby, this referral must be accepted by the caregiver or family member (Box 9). Once at the referral center, the provider must provide quality treatment (Box 10), which may be established through the use of medical records and comparisons with national protocols or those defined by the World Health Organization.

The result of the health-illness-death, or improvement process, will not depend on the illness *per se* from which the newborn has died, but will also depend on the actions taken at the community, as well as the process of seeking help. 41

The second critical point in the Road to Survival model is the possibility of quantifying each of the boxes, converting them to indicators. When death occurs, it may be attributed not only to a biological and final cause of death, but also to a breakdown during one or more of the steps of the model. Perinatal death may have occurred because the mother or the caregiver did not identify the danger or seriousness of the signs, because help was sought too late, or because the first level health worker attending the mother or the child did not prescribe a quality treatment. Referrals may not be accepted by the caregiver due to distance, lack of financial means, or lack of credibility of the system, and the appropriate recommendations for treatment and follow-up at home may not have been given by the health provider who was consulted. 41

This model “The Road to Survival” can be applied to most of the illnesses during infancy, with slight adaptations as to the definition of “quality treatment” in each. In this study, it has been used to follow the process of the illness of the mother during pregnancy and delivery, as well as the live newborn who died during the first 7 days of life. As a general model, it can be applied to each of several situations, with only slight modifications, depending on the group that is being followed (pregnancy, delivery or newborn).

In short, the conceptual framework of the Road to Survival should not be considered merely as a hypothetical model, but should be used as a tool that makes it possible to guide the contents of maternal health programs and to obtain the resources for these treatments.41

### **3. Social Autopsies**

The tool designed for obtaining information contained in each of the boxes or steps in the Road to Survival (Boxes 2 to 11) has been called “Social Autopsy”. It is a questionnaire that contains semi-

structured and open questions which respond to each of the boxes or steps of the model. Thus, one can not only obtain the number corresponding to each of the boxes, but also the “why” and “how” of certain actions. Thus, for example, it determines the number of mothers or caregivers who provided or received treatment at home, and the type of treatment received; the number of mothers or caregivers who sought help outside the home; the type of providers they went to; and the treatment provided at the time of consultation. Also the treatment prescribed, the number of mothers or caregivers who were given referrals, the number of mothers or caregivers who accepted the referrals, and the reason, as the case may be, why the referral was not accepted.

This tool complements the Verbal Autopsy questionnaire resulting in the possible cause of death and the most important determining factors both within and outside the community. Some of the contents of Box 1 of the model (preventive activities) are collected through the Verbal Autopsy questionnaire--such as prenatal control, anti-tetanus vaccinations, practices during delivery, etc.

#### **4. Mortality Monitoring and Surveys**

Monitoring of mortality has been a participatory activity carried out by the staff of the Ministry of Health in collaboration with the MotherCare and BASICS Projects. One of the indirect objectives of this activity is to provide a mechanism for joint actions of the local staff of the Ministry of Health and the community. It is expected that by participating, the community will become aware of the silent killer, the problem of perinatal death. Also, it is expected that the community will seek, and obviously the Ministry of Health will provide, forms of participation in the design and implementation of remedies to correct this problem.

The establishment of a perinatal mortality monitoring network in the four communities included in the study, have been essential for its development. This network includes all sources of information of possible causes of death, such as civil records, hospital and health services records, midwives, assistant mayors and other agents of the community.

However, the establishment of perinatal monitoring and whether these committees should be permanent, has been discussed during the early meetings of the Steering Committee and the Maternal-Infant Program of the Ministry of Public Health. It was proposed that the monitoring committees for perinatal death, which support the efforts of the Monitoring Committees of Maternal and Perinatal Death which have already been established in each health area, and which are carrying out activities to document maternal mortality rates, be institutionalized.

Once the study ends, it will be proposed that the monitoring committees of perinatal death be institutionalized. They will be in charge of each health area that is part of the study. Considering the possible options for interventions and systematization of this monitoring, the form of the methodology adopted and used in this study will be discussed, maintaining the conceptual framework proposed by the Road to Survival, which is to be used by this Committee.





## C. STRUCTURE AND LOGISTICS OF THE STUDY

### 1. Population of the study and estimates of expected number of deaths

#### 1.1 Population of the Study

The perinatal community mortality study was carried out in four rural communities in Guatemala where the MotherCare Project has been working for several years. Their selection was based on the presence of the MotherCare Project in these communities and the fact that they, through the community maternity committee, had demonstrated their concern about the high maternal-infant mortality rates.

MotherCare's knowledge of the communities and its participation through the establishment of a network of informants is essential and necessary for the development of this study. The four communities are: Momostenango, Nahualá, Comitancillo and San Carlos Sija, located in the highlands; the population is mostly rural, predominantly Indian. Only in San Carlos Sija is there a higher proportion of *ladinos* [mixed races]. Some general characteristics of the communities, according to data from the National Institute of Statistics of Guatemala, are:

#### **Momostenango/Totonicapán**

The area of Momostenango covers 305 square kilometers and is located at an altitude of about 2,204 meters above sea level. It is composed of 1 *villa* [small town], 10 *aldeas* [villages] and 109 *caseríos* [hamlets]. The total number of inhabitants is 68,391, 95% of which is Indian and 2% *ladinos*, the predominant language is *quiché*. The sources of income are mainly agriculture and handicrafts.

#### **San Carlos Sija/Quetzaltenango**

The area of San Carlos Sija consists of 148 square kilometers, and it is located at 2,642 meters above sea level. Part of the community are: 1 *pueblo* [town], 14 *aldeas* [villages] and 11 *caseríos* [hamlets]. It has 23,142 inhabitants, approximately 40% of whom are Indian and 60% *ladinos*. Aside from Spanish, the predominant Indian language is K'iche'. The principal sources of income are agriculture and handicrafts.

#### **Comitancillo/San Marcos**

The area of Comitancillo is 112 square kilometers, located at 2,280 meters above sea level. Part of the community are: 1 *pueblo*, 12 *aldeas* and 30 *caseríos*. It has a total of 36,478 inhabitants, 97% of whom are Indian and 1% *ladinos*. The principal sources of income are agriculture and handicrafts.

#### **Nahualá/Sololá**

The area of Nahualá is 218 square kilometers, located at 2,467 meters above sea level. It is composed

of: 1 *pueblo*, 2 *aldeas* and 39 *caseríos*. It has a total of 41,310 inhabitants, of which 98% are Indian and less than 1% are *ladinos*. The principal source of income is agriculture and handicrafts.

## 1.2 Estimates of the expected number of deaths

Guatemala does not have accurate data on the magnitude of perinatal mortality, especially working at the community level. In order to obtain an expected number of perinatal deaths during one year's time, within a period of six months, a series of calculations were made, based on the total population of each one of the communities (data from INE), the gross birth rate in Guatemala (35.4 per 1000 inhabitants), the national infant mortality rate (57 per 1000 live births), the perinatal death rate (45 per 1000 births) and the proportions of infant, neonatal, precocious neonatal, stillborns and perinatal deaths. The results obtained and the estimates must therefore be considered with some caution. They will serve as a basis of comparison for deaths identified by the study, always keeping in mind that they are based on estimates and are only an approximation to reality.

Table 1, for each one of the towns, determines the total population, the number of live births per year, the infant deaths in one year and estimated neonatal deaths for that year.

**Table 1. Population, Number of Infant and Neonatal Deaths in the 4 Communities of the Study**

<b>Community</b>	<b>Total Pop.<u>1</u></b>	<b>Live Births per Year <u>2</u></b>	<b>Infant Deaths per Year <u>3</u></b>	<b>Estimated neonatal Deaths <u>1 4</u></b>	<b>Estimated Neonatal Deaths <u>2 5</u></b>
Nahualá	41,310	1,462	83	41	44
Momostenango	68,391	2,421	138	69	73
San Carlos Sija	23,142	819	47	23	24
Comitancillo	36,478	1,291	73	36	39
<b>Total</b>	<b>169,321</b>	<b>5,993</b>	<b>341</b>	<b>169</b>	<b>180</b>

1 *Instituto Nacional de Estadística de Guatemala* [National Statistics Institute of Guatemala]

2 The live births were calculated by applying the gross birth rate (35.4 per 1000 inhabitants) to each one of the communities under study.

3 Infant deaths were calculated by applying the infant mortality rate of 57 per 1000 live births, to the total number of previously estimated live births.

4 Due to the lack of accurate information, it is assumed that neonatal mortality is approximately half of the infant mortality.

5 Neonatal deaths were estimated by using the neonatal death rate of 30 per 1000 live births.

With the above information for each of the communities included in the study, annual death rates during

the first week of life and stillborns were estimated, as summarized in Table 2. First, the deaths in the precocious neonatal period were estimated (first 7 days of life), on the basis that these comprise approximately 60% of all neonatal deaths. Then the number of stillborns was obtained, based on the fact that of the total perinatal deaths, between 50 and 60% are stillborn. Finally, summarized in Table 3, the expected total number of perinatal deaths per year in six months were obtained for each of the communities of the study.

**Table 2. Estimates of annual live births who died during the first week of life and stillborns**

Communities	Estimated deaths during first week of life per year <u>1</u>	Stillborns per year <u>2</u> (50% of Perinatal Deaths)	Stillborns per year <u>3</u> (60% of perinatal Deaths)
Nahualá	26	26	39
Momostenango	44	44	66
San Carlos Sija	14	14	21
Comitancillo	23	23	34
Total	107	107	160

1 It is estimated that 60% of neonatal deaths occur in the first week of life, based on estimates of neonatal deaths obtained from the neonatal death rate.

2 It is assumed that 50% of all perinatal deaths are stillborns.

3 It is assumed that 60% of all perinatal deaths are stillborns.

**Table 3. Estimates of perinatal deaths**

Communities	Number of Perinatal Deaths - 1 year		Number of perinatal deaths - 6 months	
	Estimate 1*	Estimate 2**	Estimate 1*	Estimate 2**
Nahualá	52	65	26	32
Momostenango	88	110	44	55
San Carlos Sija	28	35	14	17
Comitancillo	46	57	23	27
<b>Total</b>	<b>214</b>	<b>267</b>	<b>107</b>	<b>131</b>

? The estimate of the number of deaths (1) is based on the number of stillborns in Table 2, where it is assumed that 50% of perinatal deaths are stillborns.

\*\* The estimate of the number of deaths (2) is based on the number of stillborns in Table 2, where it is assumed that 60% of perinatal deaths are stillborns.

This study included all the cases of perinatal death identified in a period of six months (from December 1997 to May, 1998), and is therefore considered a non-probabilistic design. It was decided not to do a sampling due to the fact that, according to prior estimates, the number of expected deaths would not be sufficient for this type of study. The design is a combination of a retrospective case search (death in the three first months prior to the start of the survey) and prospective search (as cases occur), which was completed in a period of four months of data collection. Controls were not considered due to the difficulty of matching severity in a community context, the difficult control of other variables of confusion and costs involved. Therefore, extrapolations can not be done of the results to other populations nor will

risk factors be identified.

The investigation was done through the survey technique including 100% of the identified perinatal death cases.

A shortened period which only covers six months of deaths, inevitably introduces seasonal biases. These biases are not important for the biomedical causes of peri/neonatal deaths, which do not show seasonal periodicity in perinatal deaths; however, they are important because of several factors associated to the seeking of medical help, as, for instance, the effect of rains or floods in the area, which make it difficult or impossible to have access to health services.

## **2. Ethnographic Study**

Ethnographic studies, frequently used for infant health program such as Acute Respiratory Infection, Diarrhea and more recently in the Strategy of Integral Care of Diseases Prevalent in Infancy, allow for the identification of the terminology which the communities use locally to describe the symptoms or signs of some diseases, as well as do delve more deeply into the type of treatment administered in the home, 49 to indicate the knowledge and explanation of causation that the communities have regarding the diseases, the treatments recommended, their prognoses and physiopathology. These are studies that use a generally qualitative methodology, where, by means of semi-structured questionnaires or discussion groups or focal groups, information is obtained regarding the recognition of signs and symptoms of the diseases by the community. 47 Due to the type of design used in these studies, which are generally qualitative, the results are not representative. 45,47

In mortality study using “verbal autopsies” and “social autopsies” as means for identifying the cause of death and the health-illness-death process, it is especially important to carry out an ethnographic study, which makes it possible to identify the terms used by the community when referring to signs and symptoms included in the [questionnaire] instruments, which are often different from the terminology used by the health staff. The lack of knowledge of this type of study may lead to a lower sensitivity of the instrument to identify the possible diagnosis of death. It has also been noted that mothers/caregivers have a better recollection of the illness episode if locally appropriated terminology is used. 54

In order to finalize the questionnaire and adapt its terminology to the population under study, a 4-week ethnographic study was carried out. The purpose of the study was to be able to adapt the instruments (verbal and social autopsies) by identifying the terminology which the mothers used regarding the signs and symptoms related to the pathologies which were most frequently included in the perinatal period. Appendix 8 shows a list of symptoms and signs in K'iche' or Mam language, referring to the most frequent pathologies in the perinatal period. It also identifies possible options that the mothers have when seeking help, the reasons for decisions taken and the barriers which impede this seeking of help. This prior knowledge also allowed for the design of a first approach to possible codes of the questions in the questionnaires, which were finalized during the data collection.

The ethnographic study was done in October 1997, under the coordination of a professional who had experience in health topics with the Indian population. In order to obtain the desired information, 8 focal groups were formed, two in each municipality. Of these, 6 were in K'iche'/Spanish and two in Mam/Spanish, representing an ethnic composition of the population of the study. In all groups, aside from mothers who belonged to different communities, midwives and health promoters were included.

The final result of the ethnographic study was a list of key terms used by the community, which were used by the surveyors. Due to time restrictions it was decided not to translate the instruments to K'iche' and Mam, aside from the fact that often bilingual people cannot read the Maya language as written. In order to overcome the translation problem, the same people who were in charge of the ethnographic study were hired for the survey, and were trained to use the terms which were most frequently used by the communities when referring to different signs and symptoms at the time of the interview.

### **3. Instruments (Tools)**

Johns Hopkins University, the BASICS Project and MotherCare developed the instruments for perinatal verbal and social autopsies, based on the questionnaires used earlier in infant mortality studies in Bolivia, Kazakstan and the Manual of Vigilance of Mortality (BASICS), incorporating the perinatal component. These instruments were adapted to the characteristics of the population under study and were tested during the training period. Based on the findings of the ethnographic research, the local terminology commonly used by the population under study when referring to signs and symptoms of illness, were incorporated, and a list of codes was prepared for both closed and open questions.

In order to solve possible communication problems between interviewers and interviewees, bilingual surveyors were used (K'iche' or Mam/Spanish) who had participated in the ethnographic study, and were therefore already familiar with the cultural aspects of the investigation. Some of the specific terms used by mothers were included in the questionnaires (translated literally to Spanish) to facilitate their translation to K'iche' or Mam during the interviews by the surveyor.

For this study, other instruments were needed, such as:

**1. Monitoring of Pregnancy.** All women who were pregnant during the period of the study were noted and followed until the end of the study (Prospective: March to May, 1998). Thus, it was possible to identify possible stillborns or deaths of newborns until day 7 of life, which occurred during the collection of data.

**2. Mini-Census.** The mini-census served to detect all perinatal deaths that occurred in the communities during the three months prior to the start of data collection (Retrospective: December 1997 to February 1998). Thus, the census detected all pregnancies which had been concluded during the term of the study.

#### **4. Informant Network**

The timely detection of cases (perinatal deaths) was one of the most critical problems of the study. The coordinator and the surveyors were in charge of establishing a network of collaborators within the community. This network of collaborators included all possible sources who could report on perinatal deaths, including all sites and persons that could take note of the death of children, such as the civil records, cemeteries, hospitals and health centers, community organizations, homes, midwives, [health] promoters, community maternity committees, assistant mayors and other places or persons who could possibly have established ties with the municipalities. It was necessary to work with civil authorities as well as with the Ministry of Health in order to establish the mechanisms to receive such information. In order to obtain the information, a small form for data collection was provided, and in the case of midwives, it was found that it was best to obtain the information orally rather than through pre-established forms.

The collaborator network included:

- ? Community staff, such as health promoters or midwives,
- ? Maternity committees
- ? Civil Records, an Assistant to the Director
- ? In cemeteries, an Assistant to the Administrator
- ? In hospitals, a clerk from the Statistics Department
- ? In the municipality, the Assistant Mayor
- ? Family members and neighbors.

The community maternity committees, midwives and health promoters played an active role during the development of the study. Regular meetings were held with these individuals who, aside from working as key collaborators, were regularly provided with the results and progress reports of the study, thus giving them the opportunity to participate.

The surveyors served as the principal liaison of the project with the network of collaborators, whom they called on every week or two, to receive reports on deaths during the peri/neonatal period. The collaborators also provided references regarding the applicable homes.

#### **5. Steering Committee**

The study was carried out under the aegis of a Steering Committee which included officers from the Ministry of Public Health, MotherCare and BASICS. The committee's duty was to provide technical direction and to help solve unanticipated problems. The principal political, technical and executive



decisions were taken by the Steering Committee.

## **6. Panel of Experts**

Concurrently with the establishment of the Coordinating Committee, it was necessary to establish a Panel of Experts (PE). This Panel of Experts's duties were to support the development of algorithms, review the objectives and indicators, assist in the classification of the causes of death and evaluate the breakdowns on the road to survival. The panel of experts included an obstetrician, a neonatologist and a sociologist, who met regularly every one or two weeks, to review surveys and to issue diagnoses regarding each of the cases.

Because perinatal death had not been studied through verbal autopsies, one of the main functions of the panel of expert was to develop the diagnostic algorithms for the principal causes of fetal, intra-partum and precocious neonatal death, which are included in Appendix 1. The algorithms designed served as guidelines for the determination of the presumptive diagnosis of death, although, in order to attain them, they used, aside from their clinical criteria, other sections of the questionnaire, such as the open history of the first, and if available, the second person interviewed. Thus, the open history enriched the simple description of symptoms and in many cases made it possible to reach a more definite diagnosis and a greater knowledge of the situation of the woman, her beliefs and her fears during pregnancy and delivery.

## **7. Coordination and Surveyors: Training**

The coordinator of the survey was responsible for the planning, training and implementation of the survey in the four communities selected. Appendix 6 contains a description of her principal activities. In general, the coordinator of the survey, together with the principal investigator, were responsible for the appropriate leadership of the survey in the field, relations with the community, maintaining the network of informants and coordinating the activities of surveyors.

Another duty of the coordinator was to review the filling out of questionnaires, assuring the quality of the data collected and the coding of the open and semi-open questions, for which she had to develop a list of codes during the first month of the data collection.

The surveyors were 8 bilingual Indian women (6 K'iche'/Spanish, 2 Mam/Spanish), some of whom belonged to the same communities as those of the study, who had previously participated in the ethnographic study and had documented experiences in questionnaires and surveys. For security reasons it was decided that they work in teams of two, always introducing themselves to the family members of the perinatal death cases, identifying themselves through a letter of introduction from the Ministry of Health. They were trained during the month of February, for four weeks. The training included the introduction of the conceptual model of the study (Road to Survival), reading the questionnaire, definition

of the signs and symptoms listed as problems encountered during the pregnancy, delivery and with the newborn, role-playing and finally applying these to cases of perinatal death in communities not included in the study. During the training process, modifications of the instrument were made, until the final version was attained. In order to assure that the translation of the questionnaire, which had to be done by the surveyors at the time of the survey, was always the same and adjusted to the questions written in Spanish, different practice sessions were held, and by consensus, the local terminology identified in the ethnographic study was introduced. The data collection started in March 1998 and lasted for 4 months (June, 1998).

## **8. Quality Control**

One of the activities of the coordinator was to assure the quality of the data. For this, different activities were defined, such as:

1. At 10% of the surveys made by each surveyor, the coordinator was to effect a quality control of the data collected. To attain this, she would hold a re-interview of some segments of the questionnaire considered to be the most relevant and difficult. Later, she would compare her questionnaire with that of the surveyor, and if any differences were found, they would be discussed and resolved. In case where one surveyor would come up with persistent problems, she would be followed more closely in order to resolve these problems .
2. Each of the surveys carried out by the surveyors would be reviewed by the coordinator in order to find possible inconsistencies or questions that had not been answered. Any problem of internal consistency of the questions or those that had not been filled out appropriately were reviewed with the surveyor and solved.
3. In order to assure that no case of perinatal death that had occurred during the term of the study was left without being identified (December 1997 to May 1998), the coordinator would regularly review hospital records, civil records; would meet with midwives or other persons included in the network of collaborators. At the end of the study a new review of cases was made, thus assuring that all cases had been included.

## CHAPTER III: RESULTS

### A. ANALYSIS OF RESULTS

The analysis of the results was performed by using the program of statistical analysis EPIINFO 6 with double entry of data. The results are shown in tables and descriptive graphs. Together with the presentation of data and the description of each of the tables or graphs, we have included verbatim quotes from the open histories of the mothers who were interviewed, which explain and exemplify the data obtained.

### B. LIMITATIONS OF THE STUDY

1. The study includes all cases of perinatal mortality occurring in the four communities included in the study, during a period of 6 months (December, 1997-May 1998.) There may be temporary factors which, in a 6-month study, were not detected by this study.
2. The questionnaire used by the surveyors was written in Spanish, and, during the interviews, they had to translate the questions, writing down the answers in Spanish. This way they had to translate literally into Spanish the language used in the interview and write the answer down in the questionnaire. This process of translating to K'iche'/Mam of the questions of the questionnaire and the translation into Spanish of the responses of the interviewee, could give rise to inaccuracies in translations and variations among surveyors because of the difficulties of translating and classifying the signs, symptoms or illnesses, especially those determined culturally. The close monitoring of the interviewers by the coordinator, the quality control and the emphasis placed on this aspect during training, decrease the differences observed among surveyors. On the other hand, many of the questions were open, where an accurate and faithful translation was given, in the words of the mother or the interviewee herself, to be coded later.
3. Since this is the first study of this kind on perinatal mortality at the community level, the recollection of signs and symptoms by the interviewee and whether or not she was present during the process of the illness had not been validated, its specificity and sensitivity being unknown. However, with a view to a possible intervention, the whole of the results which includes the process of seeking help and the presumptive diagnoses defined by the panel of experts, are sufficient and clear at the time of its definition.
4. In recalling events after such a long time, which also includes different physio-pathological states (prenatal period, delivery and newborn) could well produce a bias of memory of the events. However, this bias could be slightly screened in this community, since frequently the obstetric complications were attributed to the "evil eye", God's will, the presence of certain socio-cultural factors during pregnancy, more than to the lack of prenatal care or medical complications. This bias of memory is reduced due to the fact that the women often attribute complications to factors

which are very different from those being studied. 25

### C. HEALTH SITUATION IN GUATEMALA

**Table 4. Principal Health Indicators in Guatemala**

INDICATOR	RATE	
Indicators of Infant Health		
Infant Mortality <u>1</u>	40 per 1,000 live births	
Infant Mortality <u>2</u>	57 per 1,000 live births	
Mortality under 5 years of age <u>2</u>	68 per 1,000 live births	
Neonatal Mortality <u>1</u>	30 per 1,000 live births	
Neonatal Mortality <u>2</u>	26 per 1,000 live births	
Perinatal Mortality <u>1</u>	45 per 1,000 births (Stillborns and live births)	
Indicators of Maternal Health		
Maternal Mortality <u>3</u>	220 per 100,000 live births	
Sololá <u>6</u>	440 per 100,000 live births	
San Marcos <u>6</u>	190 per 100,000 live births	
Quetzaltenango <u>6</u>	210 per 100,000 live births	
Totonicapán <u>6</u>	290 per 100,000 live births	
Over-all fertility rate <u>1</u>	5.1	
Coverage of TT (two or more doses) <u>1</u>	37.9%	
Birth rate <u>7</u>	35.4 per 1000 inhabitants	
Number of deliveries attended by trained providers <u>2</u>	National	South-Western
Physician	31.4%	18.9%
Nurse	3.4%	5.1%
Midwife	55%	69%
Number of women receiving prenatal care by trained provider <u>2</u>	National	South-Western
Physician	44.6%	30.9%
Nurse	7.9%	12%
Percentage of deliveries being cared for at home <u>2</u>	64.7%	
Percentage of deliveries being cared for at health service <u>2</u>		
Private Hospital	6%	
Social Security Institute	7%	
Ministry of Health	21%	
Other indicators		
Population that has access to public health services <u>4</u>	40%	
Literacy level	56% (UNICEF)	
Percentage of Indian population <u>5</u>	42.8%	

- 1 Perinatal mortality. Maternal Health and Safe Motherhood Programme. WHO. Geneva. 1996
- 2 National Maternal-Infant Health Survey, 1995. INE, MSPYAS. Guatemala 1995.
- 3 *Mujeres latinoamericanas en cifras. 1995. Instituto de la Mujer. Ministerio de Asuntos Sociales (España) y Facultad Latinoamericana de Ciencias Sociales.*
- 4 *Situación de Salud en Guatemala. Indicadores básicos 1995. OPS, Ministerio de Salud Pública y Asistencia Social de Guatemala. 1995*
- 5 *República de Guatemala. Características Generales de la Población y Habitación. Instituto Nacional de Estadística. Guatemala. C.a. Marzo 1996.*
- 6 Guatemala 2000. *Desarrollo con Equidad. Hoja de indicadores.* Proyecto Policy, 1999.
- 7 *Situación de Salud en Guatemala “Indicadores básicos 1997”.* Ministerio de Salud Pública y Asistencia Social. Sistema de Información Gerencial SIGSA, 1998

#### D. DEMOGRAPHIC DATA

**Table 5.** Demographic and Health Indicators in the Towns under Study

Community	Total Population <u>1</u>	Estimated live births per year <u>2</u>	Estimated infant deaths per year <u>3</u>	Estimated neonatal deaths <u>4</u> (ratio)	Estimated neonatal deaths <u>5</u> TMneonatal
1.Momos-tenango	68,391	2,421	138	69	73
2. San Carlos Sija	23,142	819	47	23	24
3. Comitancillo	36,478	1,291	73	36	39
4. Nahualá	41,310	1,462	83	41	44
Total	169,321	5,993	341	169	180

1 INE/DGSS 1993 Estimates

2 Live births per year were calculated by applying the gross birth rate (35.5 per 1000 inhabitants) to the total population of each community.

3 Infant deaths were calculated by applying the infant mortality rate (57 per 1000 live births)

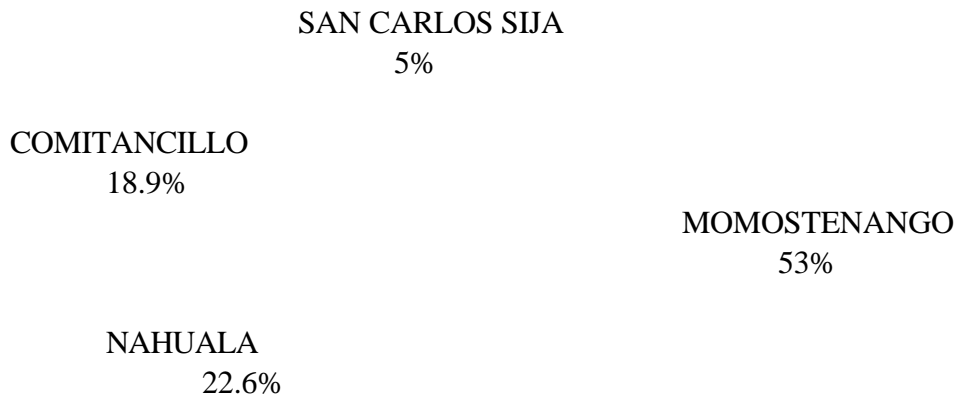
4 It was assumed that neonatal deaths are approximately 50% of infant deaths.

5 This was calculated by using the neonatal mortality rate (30 per 1000 live births)

The data obtained in this table are estimates based on the total population of each of the communities included in the study. Due to a lack of information per community, we first applied the gross birth rate (35.4 per 1,000 inhabitants) to the population, to obtain the number of live births. Then we applied the infant mortality rate (57 per 1,000 live births) the expected neonatal death ratio and the neonatal mortality rate (30 per 1,000 live births), thus obtaining the infant and neonatal deaths. Using these estimates as starting points, the expected perinatal deaths were obtained (which are live births who died in the first 7 days of life and stillborns) in 1 year and 6 months. These data, based on estimates, were used to compare the findings of the study, which is why they should be analyzed with caution (See Table 6).

### Graph 1

#### Place of Residence of Persons Interviewed



Most of the women interviewed live in Momostenango, followed by Nahualá, Comitancillo and San Carlos Sija.

**Table 6.** Number of live births and stillborns and comparison with the number of deaths expected per community

Place of Residence	Stillborns (n=101)	Live Births (n=36)	Stillborns Estimated (6 months)*	Live Births Estimated (6 months)*

Momostenango	53	20	22 - 33	22
San Carlos Sija	4	3	7 - 10	7
Comitancillo	22	4	12 - 17	11
Nahualá	22	9	13 - 18	13
Total	101	36	55 - 78	53

\* Estimates are based on the calculations described in Tables 2 and 3, in Chapter II “Methods”.  
Estimates of number of deaths, pages 32 to 35

In the six months of the study (December 1997 to May 1998) a total of 143 cases were identified. Of these, 137 responded to the survey. 73.7% of the sample were stillborns and 26.3% live births who died in the first 7 days of life. Momostenango was the community where the greatest number of cases were identified (53%), followed by Nahualá, Comitancillo and San Carlos Sija. By comparing estimates of live births and stillborns in six months for each community, in all communities except San Carlos Sija, more stillborns than expected were identified. Momostenango stands out, where between 38 and 57% more stillborns were identified than the two estimates, respectively. The number of live births identified, however, was slightly lower than the estimates in all the communities (32% less).

**Table 7.** Total of Perinatal Deaths per place of residence. Comparison with Estimated Perinatal Deaths and Percentage of Coverage

Community	Number of Cases	% of Cases	Perinatal Expected	Deaths (6 months)*	% of	Coverage
-----------	-----------------	------------	--------------------	--------------------	------	----------

			Estimate 1	Estimate 2	Estimate 1	Estimate 2
Momostenango	73	53	44	55	165	133
San Carlos Sija	7	5	14	17	50	41
Comitancillo	26	19	23	27	113	96
Nahualá	31	23	26	32	119	97
Total	137	100	107	131	128	104

\* Estimates are based on the calculations described in Tables 2 and 3, in Chapter II “Methods”. Estimate of number of deaths, pages 32 to 35

According to the estimated number of perinatal deaths in each community, (two estimates were included, the first of which assumes that of the total perinatal deaths , 50% are stillborn, and the second, where the total of stillborns is 60%). According to both estimates, during a 6 month period, there should be 107 and 131 perinatal deaths, respectively. It should be pointed out that in Momostenango more than 50% of the deaths were identified. Comparing the number of identified deaths with the two estimates in Momostenango, it was found that between 33 and 65% more perinatal deaths were found in Momostenango. En San Carlos Sija, fewer deaths were identified than those estimated, between 50 and 41% less than expected. The deaths identified in Comitancillo and Nahualá, however, are quite close to the two estimates. In total, the study identified 28% and 4% more perinatal deaths than expected (according to the estimate with which they were compared). The principal difference is the ratio of stillborns and live births of the total of perinatal deaths encountered in the study (74% and 26% respectively), which differ from the ratios suggested, where stillborns represent between 60% and 50% of all perinatal deaths.

**Table 8.** Source for the Identification of cases



Source of Information	Stillborns		Live Births		Cases	
	#	%	#	%	#	%
Civil Register	82	81	28	78	110	80
Hospital	7	7	3	8	7	5
Neighbor	3	3	1	3	6	5
Midwife	7	7	1	3	8	6
Asst. Mayor	2	2	-	-	3	2
Health Center	-	—	3	8	3	2
<b>TOTAL</b>	<b>101</b>	<b>100</b>	<b>36</b>	<b>100</b>	<b>137</b>	<b>100</b>

For the identification of cases, the surveyors used different sources of information. 80% of the cases were identified through the civil register. Of the 20% remaining cases, 7% were found through health services (hospital and health center), 6% from the midwives, 4% from neighbors and 2% from the assistant mayor.

**Table 9** Age of the Mother (n=137)

Age Group	No. of expected births (1986)* Total 6 mos.	Death ratio per 1000 live births/6 months	Number of cases	% of Cases

15 - 19	50279 25139	0.83	21	15
20 - 24	92331 46165	0.93	43	31.5
25 - 29	74880 37440	0.61	23	17
30 - 34	51367 25683	0.82	21	15
35 - 39	32794 16397	1.22	20	14.5
40 or over	13447 6723	1.33	9	7
Total	315098 157549	---	137	100

\* Data from Health Situation and Trend Assessment Program. PAHO. Washington DC, 1986.

The proportion of cases was higher in age groups of younger mothers. In 46.5% of the cases it occurred in women under 25 years of age. No case was observed in women under 15 years of age. Taking as a reference the number of births expected per age group, women over 35 years of age contributed more to perinatal mortality than younger women, with a ratio of 1.22 y 1.33 per 1000 live births.

**Table 10.** Civil status of mothers (n=137)

Civil Status	Number of Cases	% of cases	National Percentage*
Married	67	49	—
Single	3	2	—
Divorced	2	1	—
Living Together	63	46	64%
Other	2	1	--
Total	137	99	

\* Instituto Nacional de Estadística de Guatemala [National Statistics Institute of Guatemala]

Of the total cases interviewed, 95% were women who were either married or living together with someone. According to national data, 64% of the population is living together with someone.

**Table 11.** Educational level of mother (n=137)

School Grades	No. Of cases	% of Cases	National Percentage
---------------	--------------	------------	---------------------

No education	81	59	
1 <sup>st</sup> to 3 <sup>rd</sup> . Grade	42	31	76%
4 <sup>th</sup> to 6 <sup>th</sup> grade	12	9	Females
Secondary/diversified	2	1	
Total	137	100	

90% of the women interviewed who had one case of perinatal death had an educational level of third grade or less. Almost 60% of the mothers had no schooling at all. Only 10% of the women had gone to fourth grade or higher. These figures are a little lower than national figures, where 76% of the female population had not finished primary school.

**Table 12.** Language spoken by mother (n=137)

Language	Number of mothers	% of mothers
Monolingual K'iche'	76	56
Monolingual Mam	19	14
Monolingual Spanish	6	4
Bilingual K'iche'/Spanish	28	20
Bilingual Mam/Spanish	8	6
Total	137	100%

The predominant language was K'iche'. It was found that 70% of the women interviewed were monolingual; 56% monolingual K'iche' and 14% monolingual Mam. There was a 4% of mothers who were monolingual Spanish. 26% of the mothers were bilingual (K'iche'/Spanish or Mam/Spanish).

## Graph 2

**Percentage of monolingual mothers (K'iche' or Mam) or non-monolingual mothers, according to schooling level attained.**

**Blue: Monolingual**

**Pink: Non-monolingual**

<b>Blue: 66%</b>	<b>Blue: 25%</b>	<b>Blue: 9%</b>	<b>Blue: 0%</b>
<b>Pink: 43%</b>	<b>Pink: 43%</b>	<b>Pink: 10%</b>	<b>Pink: 4%</b>
<b>No schooling</b>	<b>1<sup>st</sup> to 3<sup>rd</sup>. Grade</b>	<b>4<sup>th</sup> to 6<sup>th</sup> grade</b>	<b>Over 6<sup>th</sup> grade</b>

The people from the four communities included in the study have similar characteristics. One possible difference which might determine the use of toilet facilities and in this case, the schooling level, is whether or not they are monolingual. If the proportion of monolingual mothers is considered (n=95), it can be seen that 66% of them had no schooling, compared to 43% of non-monolingual. 57% of the non-monolingual women had some degree of schooling, while only 34% of the monolingual had that.

**Graph 3**

**Second person interviewed (n=98)**

<b>MOTHER: (blue)</b>	<b>16%</b>
<b>MOTHER-IN-LAW: (pink)</b>	<b>23%</b>
<b>RELATIVES: (yellow)</b>	<b>13%</b>
<b>MIDWIFE: (green)</b>	<b>27%</b>
<b>HUSBAND: (purple)</b>	<b>18%</b>
<b>OTHERS: (orange)</b>	<b>3%</b>

Graph 3 indicates the persons who were interviewed as the second informer. Midwives were interviewed in 25 cases, followed by the mother-in-law (23), the mother of the interviewee (16), the husband (18), other family members such as an aunt, a brother, a sister-in-law (13) and others (neighbor, physician) in 3 cases. For a person to count as a second informant he/she must have been present at the time of delivery and in the case of a live birth, to have taken care of the baby during the first hours/days until his/her death. Of the 98 interviews with second informants, 10 were not present during delivery.

In 39% of the cases it was not possible to hold this interview because 1) nobody was present with the mother during delivery (she took care of herself), 2) it was difficult to locate the midwife, or there was resistance by the mother or family members to have her interviewed and located, 3) no interviews were held when the mother was cared for at the health center or hospital, which is what happened in 21 cases.

**Table 13:** Distribution by sex of the dead offspring (n=137)

Sex	# of cases	Percentage of total	Stillborns		Live births	
			#	%	#	%
Male	83	61	57	56.5	26	72
Female	53	38.6	43	42.5	10	28
Not known	1	0.4	1	1	---	---
<b>Total</b>	<b>137</b>	<b>100</b>	<b>101</b>	<b>100</b>	<b>36</b>	<b>100</b>

Of the total number of cases, 61% were males and 39% females, which represents a death distribution by sex at the total level, where more boys than girls die. The proportion of boys is still higher, both in the group of stillborns as well as live births.

**Graph 4**  
**Place of death of live births who died - by Sex**

**BOY**

**GIRL**

**Blue: Home**

**White: Home of relative**

**Green: Hospital**

This graph No. 4 shows the place where the newborn who was born live died, per sex. Most of the newborns, (both males and females) died at home (29/80.5%); 8.3% at the home of a relative. 11% of the male newborns died in the hospital.

## E. OBSTETRIC BACKGROUNDS

**Table 14.** Number of mother's previous pregnancies

No. of Pregnancies	Number of mothers	% of mothers
0	31	23
1	22	15
2	15	11
3	12	9
4	10	7
5	12	9
6+	35	25
Total	137	99

\* 2 women said that they were currently pregnant and 3 did not know.

For purposes of this study, a *primigesta* is defined as a mother where the study case is the first pregnancy and she has had no previous miscarriage/abortion/pregnancy. 31 mothers (23%) included in the study were primigestas. 26% had 1 or 2 prior pregnancies. 25% had 6 or more pregnancies, a percentage which included women with 6 to 16 prior pregnancies.

**Table 15:** Some obstetric and perinatal-infant characteristics of mothers who were interviewed (n=137)

Characteristics	Number of mothers	%
Primigesta Mothers	32	234
Mothers where case is second or more, baby died*	46	336
Mothers with prior stillborn(s)	35	255
Mothers with prior miscarriages/abortions	27	197
Mothers with prior live births, babies died	37	27

[Translator's Note: The two last columns seem to be in inverted order]

\* Includes mothers with stillborns or live births, who died.

Of the total number of mothers interviewed, 23% are primigestas. For 46 mothers the death of the case included in this study is the second or more death of a child she has had (either stillborn or live birth who died in the first 5 years). 26% of the mothers had one or more previous stillborns prior to the case of the study, 20% one or more prior miscarriages/abortions and 27% had a live birth who died during the first 5 years of life.

**Table 16:** Average pregnancies and miscarriages/abortions per age group (n=137)

Age Group	Average Pregnancies	Average Miscarriages/Abortions
15 to 20 years of age	0.74	0.13
21 to 25 years of age	1.8	0.12
26 to 30 years of age	4	0.37
31 to 35 years of age	6.52	0.48
36 to 40 years of age	9.78	1.35
41 or older	12	0.25
Total	5.8	0.45

The first column shows the average of prior pregnancies (including previous pregnancies and miscarriages/abortions) per age group of the mother. In young mothers (to 20 years of age) the average previous pregnancies is less than 1, and it increases progressively up to 12 in the group of mothers older than 41 years of age. In the second column is the average of miscarriages/abortions per age group. It is found that in the younger ages, the average of miscarriages is lower and it increases progressively with the age of the mother, until it reaches 1.35 in the group of mothers from 36 to 40 years of age. A decrease of the average of miscarriages/abortions is again noticed in the group of mothers who are 41 years old or older. When reference is made to miscarriages/abortions in this study, no distinction is made between spontaneous abortions [miscarriages] and induced abortions.

**Table 17.** Age at which pregnancy ended (n=82)

Age of Pregnancy	Stillborns	Live Births who Died	Total
Premature (under 8 months)	11 (18%)	8 (38%)	19 (23%)
Term (8 months or more)	50 (82%)	13 (62%)	63 (77%)
Total	61	21	82*

\* 55 women who were interviewed did not know the date of their last menstrual period, therefore the duration of the pregnancy could not be calculated.

Out of the total number of women who knew the date of their last menstrual period (60%), 23% had a pregnancy of less than 8 months and 77% of 8 months or more. In the case of stillborns (first column) and live births who died (second column) the length of the pregnancy was 8 months or less in 82% and 62%, respectively. In live births who died, however, the ratio of gestation period of under 8 months was greater, compared with the group of stillborns.

## F. PRENATAL CONTROL

**Table 18.** General characteristics of prenatal care

Characteristics	No.	Cases	%
Cases that received prenatal care (n=137)	114		83
Cases that had prenatal booklet (n=114)	45		39
Average month of pregnancy in which first prenatal visit occurred (n=65)*		5.8 months	

\* Does not include mothers who went to prenatal control only with midwife (36%) nor those who did not go to prenatal control (17%)

For purposes of this study, prenatal care is defined as the contact made by the mother at least once with



some accredited provider (midwife, formal health services) during pregnancy. The recommendation of WHO will be taken as a standard of appropriate frequency, which defines adequate prenatal control as 2 visits during pregnancy. In Guatemala, prenatal care is defined as the care and monitoring of the pregnancy, which allows for the observation of the normal development of the baby and vigilance of the mother's condition, thus allowing for the detection of any complication or risk of death, both for the mother and the baby.

83% of the mothers interviewed had obtained some prenatal control during her pregnancy. Of these, 39% had prenatal booklets. The first visit to prenatal control were made, at an average, at 5.8 months of gestation. For mothers who had had stillborns, the average for the first consultation was at 6.5 months of gestation, while for mothers with live births who had died, the average was of 4.1 months gestation.

23 mothers did not come to prenatal control. Although they were not asked specifically why they had not come to the control, in the open histories some explanations were given, such as the lack of access (it's far away, she's working), lack of family support and lack of knowledge about her pregnancy, especially in first pregnancies.

*“I only remember that my husband took and kicked me at my waist and above my anus. I stopped eating and when I want to eat beans it doesn't sit well with me, I get nauseous, headaches. I didn't go to prenatal control during the pregnancy because it was just me at the farm with my husband...”* (Maria, 29 years old, Comitancillo),

*“...And since I didn't know about my pregnancy, I had no control [of it], not even did the midwife control me because I was still very young, I don't know about my condition...”* (Maria, 16 years old, Momostenango)

## GRAPH 5

**Frequency of Use of Various Providers of Prenatal Control (n=168) by Monolingual (n=95) and Non-Monolingual Women (n=42)**

<b>No Prenatal Control</b>	<b>Midwife</b>	<b>Private Doctor</b>	<b>Health Center</b>	<b>Community Maternity</b>
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## Clinic

Blue: Number of monolingual consultations  
 Green: Monolingual women

Pink: No. Of non-monolingual consultations  
 Purple: Non-Monolingual women

Of the 114 women who visited prenatal control at least once during their pregnancies, 77 were monolingual and 37 were non-monolingual. Midwives were the most commonly consulted providers, totaling 106 times, followed by the health center/post, which was consulted 46 times. Monolingual women had a total of 66 consultations (39% of all consultations) with different health providers, while the non-monolinguals had 102 consultations (61% of all consultations).

The average consultation was of 0.9 for monolingual women and 2.7 for non-monolingual women.

Of the women who came to prenatal control (n=23), 78% were monolingual and only 22% were non-monolingual.

**Table 19.** Places where mothers received prenatal care (n=114)

Place of Prenatal Care	Services where prenatal care was received		
	#	Mothers	%

No prenatal control	23	16.8
Midwife	49	43
Midwife and Health Post	37	33
Midwife and Private Doctor	7	6
Midwife and other*	4	3.5
Private Physician	3	26 [2.6(?)]
Midwife, community maternity clinic and health post	2	1.7
Midwife, Health Post and Clinic (NGO/church)	2	1.7
Midwife, Clinic (NGO/church)	1	8 [.8(?)]
Midwife and community maternity clinic	1	8 ["]
Midwife, Health post and Private Physician	1	8 ["]
Midwife, Health post, Hospital and other *	1	8 ["]
Midwife, Private Physician and other *	1	8 ["]
Health Post	1	8 ["]
Health Post and Clinic (NGO/church)	1	8 ["]
Health Post and private Physician	1	8 ["]
Hospital	1	8 ["]
Other *	1	8 ["]
<b>Total</b>	<b>114</b>	<b>100</b>

\*Other: Includes the project, private nurse and Pharmacy

Midwives were the health providers which most mothers went to for prenatal control (93%). Of the 106 mothers who went to see midwives, 43% did not consult with any other health provider. 40% of the women went to health centers for prenatal control. Most of the mothers consulted with more than one health provider. In the area of the study, there are more than 250 different NGO's, which do not include midwives in their team.

Some mothers mentioned some reasons why they preferred to see a midwife, such as easy access, obtaining care in accordance with their expectations. One feature that stands out are the *temascal* baths not only during pregnancy, but also during delivery and post-partum. One midwife comments:

*"...here we have our customs, what we do is bathe the patients in temascal..."* (Valeria, 25 years old, Momostenango).

Of the histories told, one can see that midwives enjoy great acceptance by the mothers who were interviewed, aside from a credibility in the control of the pregnancy and the solution of problems.

*"...only when I found out it was coming feet down, the midwife started to fix it so it would come in position, but she couldn't achieve anything and when the time of birth arrived, he/she was feet first."* (Jerónima, 33 years old, Momostenango)

### Graph 6

#### Percentage of mothers who saw different health providers or services for their first prenatal consultation (n=114)

<b>Midwife:</b>	<b>68</b>
<b>Health Center:</b>	<b>19</b>
<b>Private Doctor</b>	<b>7</b>
<b>Other</b>	<b>1</b>
<b>Hospital</b>	<b>1</b>
<b>Community Maternity Clinic</b>	<b>1</b>
<b>Private physician</b>	<b>3</b>

Purple: First prenatal consultation (n=114)

For 68% of the mothers, the midwife was the first provider for her prenatal control, followed by a health center for 19%. These differences of usage can not only be observed during the first contact with any

health service, but are maintained if one considers the frequency of usage of each of the providers.

### Graph 7

#### Age of pregnancy at first prenatal visit per service providing care

<b>First Trimester</b>	<b>Second Trimester</b>	<b>Third Trimester</b>
<b>Blue: Midwife</b>	<b>Pink: Private Doctor</b>	<b>Green: Maternity Clinic</b>
<b>Purple: Health Center/Post</b>	<b>Orange: Hospital</b>	<b>Lilac: Clinic (NGO)</b>

Graph 7 shows that midwives and health centers/posts were the most frequently used services used by the mothers who were interviewed, for their first prenatal control consultation. The total number of cases included in that graph is 61 (it does not include those mothers who went for prenatal control only to the midwife). The second trimester is the period of the pregnancy in which the mothers went to health services most frequently, except the community clinic and the hospital, where they went the same number of times and less, respectively, than in the first trimester. First time prenatal consultations occurred during the first and second trimester of the pregnancy, while first-time consultation during the third trimester were less frequent (total 11.9%).

**Table 20.** Average of prenatal visits made by mothers who received prenatal care at various services

Place of Prenatal Care	Average number of visits per mother
Midwife	5.7
Community maternity clinic	2.3
Health Center or Post	2.7
Clinic (NGO/Church)	1.5
Private physician	1.8
Hospital	1.9
Other	1.9
Total	2.5

The average prenatal consultations of the 114 mothers who went to some health provider for prenatal control was 2.5 times. Midwives are the provider which on average were seen most times by the mother for prenatal consultations, followed by a health center and a maternity clinic.

Some factors that may explain this trend for seeking prenatal care showed up later in the questionnaire and are told by the mothers in the open histories. Some factors stand out, such as: 1) lack of care by health services.

*“When I was pregnant I had pains and I went to the health center. It didn’t matter because they did not see me. What I did was to look for the midwife...”* (Felisa, 35 years old, Momostenango)

2) the midwife, who generally lives in the same community, is nearby to the mother and it is easier for her to come when needed by the mother

*“...we told the midwife. She would always come to see me because it’s close to her house. I would send my husband to call her, she would come to see me here...”* (Ubalda, 22 years old, Momostenango)

3) Other factors of access, such as distance, lack of money, among others.

*“When I went to control, the midwife would tell me that I had to go to control at the health center, but I didn’t go, it was too far.”* (Berta, 35 years old, Comitancillo)

### Graph 8

#### Frequency with which the mothers who were interviewed saw the different health providers for prenatal care

**Blue; Clinic (NGO)**

**Green: Private physician**

**Pink: Community Clinic**

**Purple: Health Center**

**Yellow: Hospital**

**Red: Midwife**

Graph 8 shows the frequency with which the 114 mothers who went for prenatal control consulted the different health providers. 10 of the 114 mothers saw the midwife once or more. The frequency of the consultations with the midwife can be observed in the red bars. Most of the women consulted between two and eight times, although a clear peak can be observed at 4 consultations, followed by 6 and 5 consultations. In general one can see the high frequency with which women consult midwives, on one occasion, up to 20 times during the pregnancy. It seems that there is a trend that, once the mother has been seen by the midwife, consultations occur frequently, which is confirmed by the average of 5.7 consultations per woman during pregnancy. The yellow bars show the frequency with which 46 women (40.4%) went to the health center for prenatal control. Frequently women went to the health center one

time. From then on, the frequency of consultations declines slowly, which is why the average consultation for this provider is 2.7 consultation per woman during pregnancy. The blue bars represent consultations with a private physician, which included 13 women. The pattern of frequency is slightly lower, although similar to that of the health center, the average consultation with this provider being 1.8. For other providers (hospital, community clinic and (NGO) clinic, the number of prenatal consultations is low.

Midwives are clearly the health providers that offer the most important prenatal care for this population (68% of the mothers went to see midwives) and were most frequently seen by pregnant women included in this study.

Table 19 already mentioned some reasons that might explain the high frequency of use of midwives by women. Added to that (easier access, no fixed schedule, they are part of the community), could be the fear that mothers feel at the health center when they are told that the pregnancy is at risk and that they must go to the hospital.

*“...but I went to the health center and the doctor told me that if there was danger, it would be best for me to go to the hospital so that they could perform a caesarean section, but I didn’t want to go, what I did was that I put myself in God’s hands, that’s what I did, and I went to the midwife to fix it, but afterwards I spent all day fasting and the second day [the baby] started moving, I waited for God’s will and if the baby makes it as far as I know, if not, God will take it away, but to go to the doctor, I won’t, I said...”* (Carmen, 27 years old, Momostenango).

*“...and since they told me they would operate on me, I was afraid to continue going to control...”* (Delfina, 24 years old, Momostenango).

The idea that in order to get care it is necessary to make a greater effort, and the problem will not be solved, is another reason mentioned by the mothers.

*“...only when I was at 3 or 4 months I didn’t have any appetite, that’s why I went to the health center, when I got there the first day they told me that I had gotten there too late, come back another day, they told me, and at times I don’t have time for that. And I went back again, and they told me the same thing, today we can’t see you and I went back and it wasn’t until the third time that they saw me, only that time I went and the person who saw me, I don’t know who he is, but he didn’t tell me anything and that’s why I thought it better, no more, and I didn’t go again.”* (Catarina, 28 years old, Nahualá)

**Table 21.** Place of residence and number of prenatal control consultations per health provider or service.

Residence of mother	Prenatal control	midwife	Community maternity	Health Post	Clinic (NGO, church)	Private Physician	Hospital
Momostenango	63 (86%)	61 (97%)	0	24 (38%)	0	8 (12.7%)	1 (1.6%)
Nahualá	26 (84%)	22 (84%)	3 (11.5%)	11 (42%)	4 (14%)	3 (11.5%)	0
San Carlos Sija	7 (100%)	7 (100%)	0	6 (86%)	0	1 (14%)	0
Comitancillo	18 (69%)	16 (88%)	0	5 (27%)	0	1 (5.6%)	1 (1.6%)
Total	114	106	3	46	4	13	2

Comitancillo was the community that had the lowest proportion of women (69%) receiving prenatal control. The use of the different health providers is similar in the communities as to the number of controls by the midwives (between 88 and 97%) and that of private physicians. The greatest differences can be seen in prenatal consultations in the health posts/centers, where the proportion varies from 86% in San Carlos Sija and 27% in Comitancillo.

### Graph 9

#### Frequency of prenatal consultation with midwives by Monolingual and Non-Monolingual Women (n=106)

% of women

Number of consultations

Blue: Monolingual

Pink: Non-Monolingual



The distribution of the proportion of monolingual and non-monolingual women who consulted midwives is quite similar, and it can be seen that most of the monolingual and bilingual women consulted a midwife between four and six times. Starting from the ninth consultation, the proportion of non-monolingual women is greater than in the monolingual women.

### Graph 10

#### Frequency of prenatal consultation in a health/center , depending whether women are or are not monolingual (n=46)

% of women

No. Of Consultations

Blue: Monolingual

Pink: Non-monolingual

The pattern of usage of health posts or centers for prenatal control, when comparing monolingual and non-monolingual women, is quite similar. Most of the women consulted a health post or center between one and 2 times, and only non-monolingual women seem to have a higher use of health services (4 to 9 prenatal consultations), compared to monolingual women. It does not seem that the fact that they do not speak Spanish represents an obvious barrier to the use of formal health services, when a comparison is made of women who went to a health post. However, in over-all terms, it is important that the use of a health post or center is low, where linguistic and cultural problems could be determining factors, and should be kept in mind.

**Table 22.** Prenatal Consultations. Actions and Treatments Provided

Actions	Mothers seen only by Midwives (n=49)	total number of mothers seen in prenatal control (n=114)
Measurement of abdomen	3 (6%)	56 (49%)
Received medication	3 (6%)	55 (48%)
Iron		23 (42%)
Vitamins		40 (72%)
Antibiotics		1 ( 1.8%)
Received tetanus vaccine before the current pregnancy		48 (43%)
Number of Vaccines Received		
1		16
2		13
3		10
More than 4		9
Took blood pressure	4 (8%)	49 (43%)
Urine Test		11 ( 9.6%)
Blood test		11 ( 9.6%)
Was told that it was a risk pregnancy	11 (22%)	31 (27%)

The quality of the prenatal consultation was not directly mentioned in the questionnaire. However, some information was obtained systematically, relating to the different actions and treatments received during the prenatal consultation. The first column shows the actions that were taken when the prenatal consultation had only been provided by the midwife. The next column shows the percentage of actions taken for all women who came to prenatal control (114). These include those from the first column, who were seen only by a midwife.

49% of the mothers who came to prenatal control had their abdomen measured. Only 48% received some kind of treatment, including iron and vitamins. Iron alone was given to 41%, and vitamins to 72%, although it is not easy to differentiate these two treatments clearly, because often the mothers called the iron sulfate pills “Vitamins”. Midwives only prescribed medication to 6% of the mothers who were seen exclusively by them. These percentages are low, especially with regard to the administration of iron, since its formulation is included as part of the prenatal control protocol in Guatemala, both for formal services,

as well as for midwives.

Before the current pregnancy, 43% of the women had received one or more anti-tetanus vaccinations, and the blood pressure was taken only in 43% of the cases.

Laboratory tests taken are very low, only 9.6%. Also, when mothers were asked if the health provider who cared for her during prenatal control had warned her that her pregnancy was at risk, 22% of the women who had been seen only by a midwife, and 27% of all women who came to prenatal control, replied that they had been warned of any risk or danger with this pregnancy. The most frequent comments were: she was weak, abnormal position (15 mothers), that the pregnancy was not going well, labor pains before due time, severe anaemia. In most of the cases she was told to go to the hospital for the delivery.

## G. LABOR AND DELIVERY

**TABLE 23.** Where the Baby was Born

Site	Stillborns (n=101) %	Live Births (n=36) %	Total (n=137) %
Home	76	86	79
Home of family member, friend, midwife	1	6	2
Community maternity clinic	4	—	3
Hospital	15	8	13
Other*	4	—	3
	100	100	100

\*Others: Health center, private clinic

Most of the babies were born at home (79%), the ratio being slightly higher in those who were born alive and died than in the case of stillborns. In second place of birth is the hospital, where 13% of the babies of the study were born, 15% of stillborns and 8% of live births who died. The proportion of babies born in other sites, such as the community maternity clinic, at the home of another person, not the mother, the health center or private clinic is very low (a total of 8%)

Comparatively, from available national data, the proportion of deliveries at home is slightly higher than at

the national level (79 and 64.7%, respectively), while the hospital births are lower in this study (National: 7% at the IGSS and 21% at the Ministry of Health).

### Graph 11

#### Place of birth of live births and place of death (n=36)

Place of Death Place of Birth Place of Death

Pink: Home Blue: Hospital Yellow: Home of Relative

Of the 36 babies born alive, 86% were born at home. Of these, 90% died at home, 6.6% died at the home of a family member or friend, and 3.4% died in the hospital. 5.5% of the live births were born at the home of a family member or friend, of which 1 died right there and 1 died in the hospital. 8.3% were born in the hospital and all died in the hospital.

**Table 14 Decision Making Process on Where Delivery should Take Place (n=137)**  
**Who decided where to go for Delivery?**

Characteristics	#	No. Of Cases	% of Cases
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Mother herself	80	58
Mother and husband	10	7.2
Mother and mother/mother-in-law	3	2.2
Mother and Midwife	3	2.2
Mother and Other person	1	0.07
Mother, husband and mother or mother-in-law	1	0.07
Mother, husband and midwife	1	0.07
Mother, husband and other person	1	0.07
Subtotal	100	73
Husband	14	10.2
Husband and mother/mother-in-law	4	2.9
Husband and midwife	2	1.4
Husband and other person	3	2.2
Husband, mother/mother-in-law and other person	1	0.07
Subtotal	24	17.5
Mother or Mother-in-law	2	1.4
Mother or mother-in-law and midwife	1	0.07
Mother or mother-in-law and other person	2	1.4
Subtotal	5	3.6

Midwife	5	3.6
Midwife and other person	1	0.07
Subtotal	6	4.3
Health Staff	0	0
Other Person	2	1.4
Total	137	100

The decision of the site where delivery will take place seems to be one made mostly by the mother, supported in most of the cases by the decision of the husband, and secondly, by other family members or the midwife. It should be noted that only in 10% of the cases, the midwife participated in the decision and that in general, the health staff did not play a decisive role in the decision taking.

**Graph 12**

**Place where the baby was born, and place where it had been planned to have it (n=137)**



**Blue: Where it had been planned to have it**

**Pink: Place of birth**

Most of the women had their baby at the place which they had chosen, their home. Only 20% of the times did she have the baby in a place different to the one initially decided on.

Counting the women who did not have their child in the place they had initially chosen, 89% had planned to have it at home and 11% at the hospital. Home is the place where most of the women of the study had decided to have and do have their children, which is reflected in national statistics, where 64% of the women delivered at home. This national percentage would certainly be much higher if only the rural population were counted.

95% of the mothers planned to deliver at home. In second place was the hospital, where 13% had their babies, although only 4.3% had planned to have it there. Other places where babies were born were the home of some member of the family, the community maternity clinic and others (project).

When reading the open histories told by mothers regarding the decision of where delivery should take place, the role of the husband and family members is much more apparent than in the responses obtained from the questions in the questionnaire. The mother decides where delivery is to take place in 73% of the cases. The role of the family members is especially important in deciding when there is a need of referrals or some complication arises, which can be seen in the narratives.

In those cases, a midwife comments:

*“...I arrived, I begged the man or his brothers that we should take her to the hospital so she could be taken care of,... and he said no, we have no money, only the brothers were there and the husband was not there, and if she dies, let her die they said...”* (Valeria, 25 years old Momostenango)

Also, the absence of the husband and the lack of autonomy of a woman can decide where the baby will be born:

*“...and when I went into labor when my baby was born I was about to die, I almost died, because the baby was very fat and it was dead. I say that is why I could not give birth and since they did not take me anywhere because my husband was not there, he was on a trip, the only thing they did is they went to buy an injection and they gave me a shot so the baby would be born fast...”*Olivia, 38 years old, Momostenango)

**Table 25** Reasons why the Delivery was moved to another site 1 (n=27)

Reasons	Number of Cases	Percentage of Cases
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Moved residence	1	3.7
The midwife was not there	1	3.7
Decision taken by other relative	1	3.7
Problems arose during pregnancy	2	7.4
There was no time — the baby was born too fast	3	11.1
Problems arose during delivery	22	81.5
Fear, dread, shame of the hospital	1	3.7
Family support or influence	2	7.4

1 In general, referring to joint decision of mother and husband and more than one reason was expressed.

When asked on the principal reasons why 27 of the mothers changed the site of the delivery of their baby, problems during the time of delivery was the reason most frequently mentioned (81%). In many of the open histories, the reason for changing the site of delivery is described. Frequently this decision was taken late, when already being faced with a complicated delivery that could not be handled at home.

*“...I went to the hospital because the midwife said the baby was being born in a bad position, first his little hands were coming out and that’s why I went to the hospital because the baby would not come out and I had a lot of hemorrhage.” “Anything else?” “I was already very cold, I was about to die, I had only 10 minute until I would die when I got to the hospital, I no longer felt it when they operated on me and took the baby out, I was unconscious. I did not go to control, the midwife arrived when I was in labor, but she said I had better go to the hospital, because first the hand came out at about 4:30 and at 5:30 they took me to the hospital. The baby had already been hurt, in other words, his little hand had been broken.” (Isabel, 24 years old, Comitancillo)*

*“...that’s why I didn’t have the baby here, I had to go to the doctor. That’s how it was. After a long struggle, because for two days I was here at home. I started labor at 6 in the morning and at around 10 in the morning they took it out, the baby was coming feet first...” (Cristina Susana, 35 years old, San Carlos Sija)*



Only in two cases the change was due to a problem detected during pregnancy (prenatal control). The lack of time because of the rapid birth of the baby and the lack of family support are other causes mentioned by the mothers who were interviewed.

*“My husband was not here, he was on a trip, he had been gone for about five days. He was not there, it was only us, he had not left money, nothing...”* (Isabela, 31 years old, Momostenango)

### Graph 13

#### Person who attended the delivery: Comparison between percentages of the study (n=137) national percentage and percentage of the South-Western Region.

80  
60  
40  
20  
0

% of Study      National %      South-Western %

Blue: Herself, mother-in-law, neighbor, mother    Pink: Doctor, nurse      Green: Midwife

The midwife is the health agent who cared for most deliveries (71%) Only 18% of the deliveries were overseen by health staff and 11% of deliveries were not overseen by any health provider. The results of the study are similar to the figures found for the South-Western region (where the area of the study is located), although the percentages of deliveries cared for by midwives and those that received no care at all from trained health staff are slightly higher in the study. At the national level, although 55% of the deliveries were overseen by midwives, one third of the deliveries are overseen by a doctor or a nurse.

In almost all deliveries, there was more than one person present. After the midwife, the mother or mother-in-law and in second place the husband, these are the persons who most frequently were with the mother.

## H. COMPLICATIONS DURING PREGNANCY, DELIVERY AND NEONATAL PERIOD

All mothers were asked an open question so she could tell, in her own words, everything that happened during pregnancy, delivery and, if the baby was born alive, with the baby. Any complications that were mentioned spontaneously by the mother are noted in the first column. Those that were not mentioned spontaneously were asked (second column), so that a positive sign would not be duplicated. All mothers

were asked, if she did not mention it herself, about all complications during pregnancy, delivery and the newborn, listed below.

**Table 26.** Complications During the Pregnancy, Mentioned Spontaneously or Asked of the Mother During the Open History Section, in the Questionnaire Regarding Stillborns and Babies Born Alive who Died (n=137)

Complication	<b>STILL-</b> Spontaneous Mention	<b>BORNS</b> Asked Yes (%) DN*	<b>LIVE</b> Spontaneous Mention	<b>BIRTHS</b> (n=36) Asked Yes (%) DN*	Total (n=137)
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Weakness, lack of appetite, (anaemia)	32	32%	24	23.7	-	9	25%	12	33	1	77	56
Vaginal Bleeding or Hemorrhage	4	4%	8	8	-	1	2.8%	6	16	1	19	13.8
Water Breaks	4	4%	9	8.9	-	1	2.8%	3	8.3	1	17	12
Swelling of face and hands	3	3%	6	5.9	-	1	2.8%	1	2.7	1	11	8
Fits	-	-	-	-	-	-	-	1	2.7	2	-	-
High Blood Pressure	1	1%	7	7	-	-	-	2	5.4	3	10	7.3
Fever, chills	15	14.8%	6	5.9	-	10	27%	2	5.4	1	33	24
Baby stopped moving	2	2%	17	16.8	4	2	5.5%	2	5.4	2	23	16.8
Premature labor	13	12.8%	13	12.8	1	4	11%	8	22	1	38	27.7
Diabetes	-	-	-	-	11	-	-	-	-	3	-	-
Positive Syphilis test	-	-	-	-	3	-	-	-	-	2	-	-
Ulcer, weal, in private parts	-	-	-	-	-	-	-	-	-	1	-	-
multiple pregnancy (twins, triplets)	2	2%	1	1	1	-	-	4	11	1	7	5
Earlier caesarian section	1	1%	3	3	-	-	-	4	11	1	8	5.8
<b>Total Complications</b>	<b>77</b>		<b>94</b>			<b>28</b>		<b>44</b>			<b>243</b>	

Number of mothers that did not refer to any complications during pregnancy					21	15
----------------------------------------------------------------------------	--	--	--	--	----	----

\*DN: Doesn't Know

The first column shows the spontaneous responses from mothers during the open history of what happened during the pregnancy, differentiated by stillborns and live births with their respective percentages. The symptom most frequently mentioned by the two groups was the feeling of weakness. No important differences were noted in the percentages of the presence of different symptoms between stillborns and live births.

In total, the mothers of stillborns, referred, on average, to the presence of 1.7 symptoms during the pregnancy, and the mothers of newborns referred to the presence of an average of 2 symptoms during the pregnancy.

The second column has differentiated the number of mothers who replied affirmatively when asked about each of the symptoms (excepting those who had already mentioned them spontaneously), the percentage and the number of mothers who replied "Don't Know" (DN). The inclusion of the Don't Know category is important, because it may help to differentiate those symptoms which "are not present" (the mother recognizes them and did not feel them during pregnancy) of those that the mother did not know whether she had them or not. However, and possibly due to the way the questions were asked about the symptoms, diabetes, positive syphilis tests and even the presence of ulcers or weals in their private parts, were answered predominantly with "No", in spite of the fact that it should have been expected that the majority of the women would answer "Don't Know".

The presence of weakness during the pregnancy was the most frequent symptom of mothers of stillborns and live births (close to 50%). The presence of premature labor pains was also mentioned by 27.7% of the mothers, although with this symptom it is difficult to differentiate birth contractions with Braxton Hicks contractions (normal in the third trimester of pregnancy), which, for purposes of interpretation, can decrease this value. It is important to note that the surveyors were trained to ask about the most difficult symptoms, as in this case, premature labor pains. The presence of fever was mentioned by 24% of the mothers, it being more frequent of mothers who had live births who died. It is noteworthy that 16.8% of the mothers stated that they had stopped feeling the baby move. Among the mothers who said they could not feel the baby move during pregnancy, 18.8% had stillborns and 11% had a live baby who died during the first 7 days of life;. Bleeding was also mentioned by 13.8% of the mothers.

*"..it's that the bleeding never stopped, never stopped. I always was bleeding, that's why he died, the baby died because of menstruation. Only one day, two days it would not come, but only that, and it came down again, just like that, just like that, until the time of delivery came, I was*

*hemorrhaging and had not gotten better...*” (Francisca, 35 years old, Momostenango)

*“...and I started Tuesday night, only heavy bleeding is what I had. I still had two months to go before the baby was due, I didn’t do anything, because I don’t know...”* (Catarina, 16 years old, Nahualá)

No mother mentioned the following symptoms spontaneously, nor answered affirmatively when asked about it: fits, diabetes, positive syphilis and ulcers, or weals in their private parts. It is possible that the negative response was due to the fact that they don’t recognize these symptoms, that is why for other studies, these should be validated and approached in a different fashion.

#### **Graph 14**

**Complications present during pregnancy, which were mentioned spontaneously or when asked of 137 women who were interviewed.**

**43% Mentioned spontaneously (blue)**

**57% Mentioned when asked (pink)**

56.7 of the complications were mentioned spontaneously during narration (open history) of the mother, while 43.3% of the complications were only mentioned when the mother was asked about whether these were or were not present.

**Table 27.** Complications during labor and delivery, mentioned spontaneously or asked of the mother during the open history section of the questionnaire for stillborns and live births who died (n=137)

Complications	Stillborns Spontaneous Mention	(n=101) Asked Yes (%) DN*	Live Spontaneous Mention	births (n=36) Asked Yes (%) DN*	Total	
					No.	%

Was the delivery longer than normal	12	12	12	12	-	2	6	3	8.3	3	29	21
Did you push for a long time (>2 hours)	2	2	24	24	2	1	3	7	19	-	34	25
Heavy bleeding or hemorrhage	13	13	16	16	1	-	-	11	31	-	40	29
Delivery before due date	2	2	16	16	1	-	-	10	28	-	28	20
the water was brown or yellow	-	-	8	8	37	-	-	1	2.7	14	9	6.5
The water was green	-	-	1	1	32	-	-	1	2.7	10	2	1.4
Fits	-	-	-	-	-	-	-	-	-	-	-	-
“Pressure” or high blood pressure	2	2	5	5	3	-	-	1	2.7	-	8	5.8
Fever, chills	1	1	22	22	-	1	3	11	31	-	35	26
Abnormal position	27	27	21	21	5	2	5	4	11	2	54	39
the umbilical cord came out before the baby	-	-	1	1	21	-	-	-	-	4	1	0.7
The placenta came out before the baby	1	1	4	4	10	-	-	-	-	1	5	3.6
Delivery by surgery or forceps	4	4	8	8	2	-	-	1	2.7	-	13	9.5
The umbilical cord was rolled around the baby	-	-	10	10	24	-	-	3	8.3	2	13	9.5

Total Complications	70	192			262
did not have complications during delivery					23 17%

\*DN: Don't Know

Abnormal position during delivery is the complication mentioned most frequently by mothers (40%), among stillborns, by 47% and live births, 16.4%. Keeping in mind the open histories of the mothers, the high number of stillborns is possibly due to trauma/death during delivery, which is, therefore, preventable with quality care during delivery.

*“...the only thing that happened is that since it was coming feet first, only the little feet came out and half of the body was still inside. Only the little feet came out, to the waist, that's what the midwife told me, because I didn't realize it. She told me and I say that's why he got strangled, because I could feel his little hands, they were coming out, but were stuck and I also felt that he was moving his little feet when he got stuck, and since he was stuck for a long time, like 15 or 10 minutes, and the only thing the midwife did was give me oil...then she said it was because I had not been drinking, they went to get it fast, and I drank it. That's what helped me for the other half of the baby to get born, but he didn't get born, he was dead.”* Jerónima, 33 years old Momostenango)

Bleeding or hemorrhaging occurred in 40 (29%) of the births. This complications includes both intensive hemorrhaging during delivery as well as immediately after birth. This complications occurred in a similar proportions for stillborns as well as those that were born alive.

*“...and I thought I had only 15 days before I was due, I had such heavy bleeding, but it was too much, it was coming down like a waterfall, that's why he died, and I was hurting so much, so much pain. Every time it hurt, the hemorrhage would come down, like the throat of a pig that had just been stuck with a knife, that's how the hemorrhage was coming down, and it was clots that were coming down...I 'm no longer eating anything at home because my stomach hurt me. I got sick because every time I would walk, the bleeding would come, as if it were pieces of liver, one piece, another piece, and that's how it came, and then another piece, like it was a piece of lard that would fall down, who knows what happened to me...it was like boiled cow blood what was coming down, what a pity what happened to me, how sad...and then another would come down that was like snot and then, at that time the baby would move and I would get a stomach ache every time that he moved...”* (Francisca, 35 years old, Momostenango)

Prolonged labor and pushing for more than two hours, is mentioned by 21 and 25% of the mothers, respectively, the proportion being slightly higher for stillborns than for those born alive.



*“...when I started labor, I felt cold at first, then I got a fever and it took three days to deliver, and I pushed for a long time, I think that the death of my baby is due to the fact that I took long with my labor pains and pushed a lot, then my child was coming out tired, but since I didn’t have the baby, the midwife gutted my stomach really hard so that I would give birth...”* (Ofelia, 37 years old, Momostenango).

Another complication mentioned frequently is delivery before due date (20.4%) more frequently with live births than with stillborns (28 and 18% respectively). Also, 25.5% of the mothers said that they had fever, more frequently with live births than with stillborns (33 and 23% respectively). Of all the mothers who had been interviewed, 1% did not mention any complication during delivery.

In the second column, where the responses of the mothers are listed when asked about those symptoms that they had not mentioned spontaneously, a third answer choice is included, “Don’t Know”. It is important to include that answer, because many of the characteristics of the delivery are not felt directly by the mother and she only knows about it if the person who oversaw the delivery or another person accompanying her mentioned it to her. We find an important percentage of mothers who answered “don’t know” when asked about the presence of “the water was brown or yellow” [51 mothers 37%], “the water was green [42 mothers (30%)], “the umbilical cord came out before the baby” [25 mothers (18%)] and “the baby had the cord rolled around him” [26 mothers 19%]. One should add that the asking of the questions about whether a symptom was or was not present, some of the answers which were taken down as “no” could actually be “don’t know”.

In complications occurring especially during delivery, the second person interviewed, if he/she was present during the delivery, is important, because he/she could complement and confirm the symptoms mentioned by the mother. In this study, although there were 908 second interviewees, they were not asked about the symptoms that occurred during delivery. It might be important to include this in future studies of this kind.

### **Graph 15**

**Presence of complications during delivery which were mentioned spontaneously or when asked of 137 women who were interviewed.**

**27% Mentioned them when asked (blue)**  
**73% Mentioned them spontaneously (pink)**

The 137 women included in the study had a total of 239 complications during delivery. Of these complications, 70 (27%) were mentioned spontaneously in the open history, while 192 of the complications (73%) were recognized by the mother when questioned about them.

**Table 28.** Complications of the newborn, which were mentioned spontaneously or asked of mothers for babies born alive who died. (N=36)

Complication	Spontaneous Mention		Asked			TOTAL	
	Number	Percentage	Number	Percentage	DN	Number	Percentage

Was very small	1	2.7	9	25	-	10	28
Was born before due date	1	2.7	10	28	1	11	30.5
Had a physical handicap	-	-	-	-	-	-	-
Had bruises	1	2.7	2	5.4	2	3	8.3
Did not suckle	3	8.3	15	41.6	-	18	50
Suckled without strength	-	-	5	14	-	5	14
Suckled well, but stopped suckling	-	-	4	11	-	4	11
Did not cry	1	2.7	6	17	-	7	19.4
Cried loudly, but stopped crying	1	2.7	8	23	-	9	25
Whimpered, crying a lot	2	5.4	8	22	-	10	28
Stopped moving	-	-	7	19.4	2	7	19.4
Fits	-	-	-	-	2	-	-
Stiffened	-	-	1	2.7	3	1	2.7
Ran a fever	2	5.4	8	22	5	2	5.4
Was cold, got cold	1	2.7	7	20	4	8	22
Fontanelle was swollen	-	-	1	2.7	8	1	2.4
Was born blue, turned blue	3	8.3	1	2.7	2	4	11
Born pale, bad color	-	-	7	19.4	3	7	19.4
Had blotched skin	2	5.4	-	-	3	2	5.4
Had pimples on skin	-	-	1	2.7	2	1	2.7
Was yellow	-	-	-	-	7	-	-
Navel was red, with pus, other matter	-	-	1	2.7	6	1	2.7
Difficulty breathing	1	2.7	7	19.4	6	8	22

Rapid breathing	-	-	3	8.3	4	3	8.3
Had dysentery	-	-	-	-	2	-	-
Had stool, diarrhea	-	-	1	2.7	2	1	2.7
Was very big	-	-	4	11	1	4	11
Bad smell at birth	-	-	-	-	3	-	-
Vomited everything, vomiting	-	-	6	16.6	2	6	16.6
<b>Total Complications</b>		19		116			141

All the live births who died during the first 7 days of life, had one or more symptoms. 18 (50%) of the newborns “did not suckle”, 30.5% was born before the due date and 28% were considered as very small by the mother.

*“...maybe she did not take care of herself, or took some pill, since she comes from far away from here. Now, when the baby was born, it was very small, it was not fat, did not live long. It died. (Justa, 20 years old, Momostenango)*

Other complications that were frequently mentioned were: the baby was cold or got cold and had difficulty breathing in 22% of the newborns, did not cry (19.4%) stopped moving (19.4%) and was pale, bad color (19.4%).

None had fits, dysentery or jaundice. When the mother was asked if the baby had any physical handicap, no affirmative reply was received. Afterwards, when reading the open histories of the mothers, some did mention the aspect of the newborn, without explicitly giving the physical handicap. This was not caught by the surveyors, which is why no case of physical handicap is noted in the column under “mentioned spontaneously”.

Some of the symptoms which were asked were answered by the mother, to a large extent as “Don’t know”. For example, the complication: “Was the patella swollen (8, 22%), was it yellow (7, 19.4%), was the navel red, had pus or other matter and difficulty in breathing (both 6, 16.6%

## Graph 16

**Presence of complications in the newborn, which were mentioned spontaneously or when asked, by 36 women who were interviewed:**

**Mentioned spontaneously: 18% (blue)**

**Mentioned when asked: 82% (pink)**

A total of 110 complications were present in newborns, of which 19 were mentioned spontaneously by the mother in the open history, while 116 were mentioned when she was asked whether these complication(s) were or were not present. There was no newborn that did not have at least one or more complications.

The complications of the newborns are mentioned less frequently spontaneously, than the complications the mother had during the pregnancy and delivery (43% and 27%, respectively). This difference may be because of the way the open interview was held, where special emphasis was placed to problems during pregnancy and delivery. If the mother had a live child who died, she was asked about the baby. In reading the open histories, it is noteworthy that the mothers say very little about the status and complications of the baby. One possible explanation might be that since the baby's condition is closely associated to the pregnancy and especially during the delivery, she does not differentiate it quite as clearly, especially when death occurs during the first hours or days of life of the baby, as it is in most of the cases (21 of 36 died in the first 24 hours).

**Table 29.** Number of complications during pregnancy and delivery in stillborns and live births who died (per complications listed earlier)

<b>Number of Complications</b>	<b>% of stillborns (n=101)</b>	<b>% of live births who died (n=36)</b>	<b>Total (n=137) %</b>
<b>Complications during pregnancy</b>			
0 complications	15 (15%)	6 (17%)	21 (15%)
1 complication	36 (36%)	10 (28%)	46 (34%)
2 complications	26 (26%)	10 (28%)	36 (26%)
3 or more complications	24 (25%)	10 (28%)	34 (24.7%)
<b>Complications during delivery</b>			
0 complications	17 (17%)	7 (17%)	24 (17%)
1 complication	21 (21%)	10 (28%)	31 (23%)
2 complication	20 (20%)	14 (39%)	34 (25%)
3 or more complications	43 (43%)	5 (16%)	48 (36%)
<b>Complications of the newborn</b>			
0 complications		0	0
1 complication		4 (11%)	4 (11%)
2 complications		8 (22%)	8 (22%)
3 or more complications		24 (66%)	24 (66%)

The percentage of women who did not have any complications during the pregnancy and delivery is approximately 17%, both for the group of stillborns as well as babies who were born alive and died. Most of the women had one or two complications during pregnancy, both in stillborns as well as live births (60%). 24.7% had three or more complications. No great differences were observed between stillborns and live births who died, as to the number of complications during pregnancy.

With regard to complications during delivery, more mothers in the group of stillborns had more than two complications (43%), compared to 16% of the live births. 67% of the mothers who had live births had only one or two complications.

The number of complications in the group of live births is much higher than those mentioned during pregnancy and delivery. There was no live newborn who did not have at least one complication. While 33 had one or two complications, the remaining 67% had three or more complications.

## I. Stillborns

**Table 30.** Size of baby per gestational age and mother’s perception of the size of the newborn

Mother’s Perception	Baby’s size per gestational age		Total
	Small (Under 8 months)	Normal or large (more or equal to 8 months)	
		-	
Small	6	5	11
Normal or large	1	40	41
Total	7	45	52

Table 27 compares the mother’s perception of the stillborns to the size of the baby and the gestational age. For this comparison it was determined that “small” newborns would be all those under 8 months gestation, and “normal or large” all of 8 months or more of gestation. It is not possible to differentiate the low birth weight full-term babies in this study, since neither the optometric measurements of the newborn nor the weight at birth are available.

52 mothers of stillborns saw the baby after birth and identified the size of their baby. In total, taking the gestational age as gold proof, there were 7 small newborns and 45 normal or big newborns. The mothers perceived a total of 11 babies as small and 41 as normal or large. If the subjective perception of the mother is translated into reliability data, one finds a sensitivity of 85.7%, a specificity of 88.8%, a diagnostic precision of 88.5% and a percentage of correct results of 13.5%.

**Table 31.** Size of the baby per gestational age and midwife’s perception of the size of the newborn

Mother’s perception <i>[Translator’s note: Should be Midwives’ perception]</i>	Size of newborn per gestational age Small (under 8 months)	Normal or big (more or equal to 8 months)	Total
Small	4	0	4
Normal or big	3	8	11
Total	7	8	15

Of the 15 midwives who were interviewed as the second person in a case of a stillborn, 4 identified the newborn as small and 11 as normal or big.

As per the previous table, for purposes of this analysis it was determined that the gestational age was the defining factor of a baby’s size, excluding the determination of possible small full-term babies. In spite of the fact that the case number is low (15), the sensitivity and specificity data are demonstrated. Sensitivity is 57%, specificity is 100% and diagnostic precision is 80%.

In spite of the difference in size of the samples in the two previous tables (mother’s and midwives’ perception of the size of the baby (stillborn)), the mothers have greater sensitivity to determine the size of the baby than the midwives. The latter had greater specificity in identifying the size of the newborn. Diagnostic precision was slightly higher in the mothers than in the midwives.

**Graph 17**



**Signs mentioned spontaneously by the mother and the second interviewee, indicating that the baby had been born dead (stillborn)**

**17. Mother (N=101)**

**Did Not cry                      Did Not Breathe**  
**Did not Move**

Graph 17 shows the three signs included in the survey as indicators of the death of the baby (stillborn). The 101 mothers of stillborns were asked how they had noticed that the baby was dead and only the spontaneous responses of the mothers were written down (they could be multiple). Only 43 mothers mentioned one or more of these signs. The three signs are: did not cry, did not breathe and did not move. The sign most frequently mentioned by the mothers was “did not move” (29 out of 101 mothers/28.7%). Second, they mentioned “did not cry” (27/26.7%), and “did not breathe” was only mentioned by 11 mothers (10.8%). Four mothers mentioned the three signs spontaneously, 13% mentioned “did not move and did not cry” and 7% mentioned “did not cry and did not breathe”.

None of the three signs alone is sufficiently sensitive to identify with certainty the death of the baby. It could be feasible that those cases where the mother only mentioned that the baby was not moving, he might have been alive, only very depressed. This could also be true for the sign “did not cry” and “did not breathe” (breathing can be very superficial and almost imperceptible). The greatest certainty of death would be in the mention of all three signs (4%), followed by those mentioning two of the signs (20%). This might explain in part the high number of stillborns found in the study, since it is difficult for mothers to establish with certainty the death of the newborn when it is born depressed. However, for purposes of an intervention, it is necessary to differentiate stillborns and live births, since both are included in the perinatal mortality indicator without distinction and are considered as a continuum.

25 mothers responded spontaneously to the “other” option, which includes “the midwife said so” (15, 14.8%) “the nurse or the doctor said so” (6.6%) “some other relative said so” (2).

The 77 second informants of stillborn births were asked how they had realized that the baby had been born dead. The following graph shows their replies.

**Graph 17**

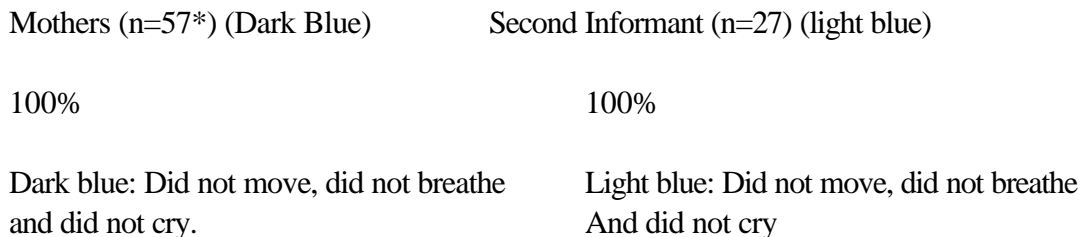
**17. SECOND INFORMANT (n=77)**

**Did not cry                      Did not breathe**  
  
**Did not move**

50 second informants responded one or more of the options defined as: did not cry, did not move and did not breathe. In total, 33 persons (43%) responded “did not cry”, and “did not breathe” (18%). As in the case of the mothers, “did not breathe” was the sign that was mentioned least. 43% of the 77 second informants (34) only mentioned one of the three signs, and only 3.8% mentioned all three. In comparing the answers of the mothers with those of the second informants, there was no difference in the appreciation about the status of the baby at the time of birth. 13 second informants mentioned the “other” option, which was “the midwife said so” (9), “the doctor said so” (1) and “I saw that he/she was cold” (3).

### Graph 18

Signs indicating that the baby was born dead, asked of the mother and the second informant



\*One mother answered “don’t know” on the three signs

Graph 18 shows the results of all answers from mothers and second informants, when they were asked about each one of the signs indicating death (did not cry, did not move and did not breathe). This question was only asked of those mothers or second informants who had not mentioned any of them spontaneously. Spontaneously, 43 mothers (42.5%) and 50 (65%) of the second informants mentioned one or more of the signs included. The other 57.5% of the mothers and 35% of the second informants were asked about whether each one of the signs was present or not. Of the 58 mothers who were asked about the presence of each of the three signs, 57 responded that the newborn did not cry, did not move and did not breathe. One mother [when asked] about the three signs said she did not know. All second informants answered that the three signs were present when asked about them.

**Table 32.** Condition at birth (total stillborns = 101)

Signs	First Informant	Second Informant	Total <u>1</u> referring to the sign

Condition at birth (of stillborn)			
Macerated	0	2	2
Malformations	5	10	15
Normal	41	54	95
Other*	9	11	20

1 The total times the presence of the sign was mentioned. It corresponds to the addition of the first two columns.

\* Other included: Swollen face, extremities changed color blue or green.

As to the condition of the baby at birth, none of the mothers observed maceration, most saw him as normal, 5 mothers and 10 second informants observed some physical impediment.

*“...because his head was sunk as if it were something soft, one can press it with one’s finger and the impression of one’s finger is there; that’s how the head of my son was...”* (Ofelia, 37 years old, Momostenango)

**Table 33.** Persons who saw the baby and confirmed that it was stillborn

Action	First informant	n=101)	Second informant	n=77)
	Mother	Others	CAT*	Others
Saw the baby	54	—	15	46
Ascertained that it was stillborn	15	86	10	67

\* The midwife was only the second informant in 15 cases of stillborns

There were multiple options for responses, which is why more than one person might have ascertained the death of the baby. In the questionnaire the mother was asked (first informant) if she had seen the baby. Since all the persons interviewed were mothers, the space under “others” is empty. The ascertaining that the baby was stillborn is a multiple-choice question, where the mother could have included other persons, which is corroborated by the presence of numbers in both boxes.

Only 53% of the mothers with stillborns saw the baby after birth, and in only 15% of the cases it was she who ascertained that the baby was dead. The midwife was only the second informant in the group of stillborns for 15 cases. She saw all the babies and ascertained that they were dead in 67% of the cases. Other persons present during delivery were the husband, a neighbor, the mother or mother-in-law and the medical staff, and it was they who finally ascertained that the baby was dead. Almost all first and second

informants (98% and 99% respectively) mentioned that the death of the newborn was ascertained immediately after birth.

**Table 34.** Fetal movements felt by the mother in stillborns and perception of the mother as to the viability of the offspring (n=101)

Sign	Yes %	No %	Don't know %	Total %
Mother stopped feeling movements before baby was born	47	48	5	100
Mother thought the baby would be born dead	3	95	2	100

47% of the mothers stated that they had stopped feeling fetal movements before the baby was born. However, only 3% believed that the baby was going to be stillborn (these mothers did not necessarily associate the absence of fetal movements with the viability of the offspring)

**Table 35.** Time before delivery when the mother stopped feeling fetal movements in stillborns (n=47)

Time	Number of cases	Percentage of cases
------	-----------------	---------------------

Three or more days before delivery	12	25.6
One or two days before delivery	9	19
Less than one day	4	8.5
During labor	22	46.9
Don't know	0	0
	47	100

Of the 101 mothers with stillborns, 53.5% did not mention the absence of fetal movements. Of the 47 mothers who had stopped feeling fetal movements before the birth of the baby, 46.9% said they had noticed the absence of movements during delivery. 44.6% of the cases mentioned the absence of fetal movements from one to two days before delivery, and these are the ones who might indicate possible fetal death during pregnancy (21 cases).

*“...and already on the 8<sup>th</sup> day I no longer felt if it was moving or had no movement. That’s when I went to her (private physician) and she told me that he was all right, but what had happened is that the baby was seeking his position, that is why one couldn’t feel his movements...I came home, and kept on feeling that there was no movement and which, when I got to the hospital, it was that they told me the baby was dead...”* (Marina, 35 years old, Comitancillo).

**Table 36.** They stopped feeling fetal movements (taken from the list of complications during pregnancy) for stillborns and live births (n=137)

Stopped feeling fetal movements	Stillborns	Live Births
Yes	19	4
No	78	32
Don't Know	4	--

Total	101	36
-------	-----	----

The question regarding whether or not there were fetal movements was asked in two different sections of the questionnaire. Table 32 analyzed the question about fetal movements, asked of mothers of stillborn babies (n=101). Table 33 includes what was obtained from a question asked of all mothers (it is part of a list of complications), which is why the n=137. [Translator's note: The numbering of tables seems to be wrong]

Regarding mothers who mentioned an absence of fetal movements in a list of complications during pregnancy, 11% were mothers who had a baby who died in the first 7 days of life, and 18.8% of mothers with stillborn babies mentioned the absence of movements, either spontaneously or when asked.

It should be pointed out, that when the question was repeated to mothers of stillborns (see Table 31), 47 mothers answered that they noticed the absence of fetal movements, 27.7% more than in the first question.

## 2. Live births who died

### Graph 19

#### Age of the newborn at the time of death (n=36)

(Babies)

20  
15  
10  
5  
0

Less than 12 to 24 24 to 48 3 days 4 days 5 days 6 days 7 days  
12 hours hours hours

#### Live Births who Died (n=36)

53% of the live births died during the first 12 hours of life. 28% of the cases died between the second

and third day of life, and the remaining 13% died between the fourth and seventh day of life.

**Table 37.** Measures taken with newborn in cases of live births who died during the neonatal period (n=36)

Measures	Number and Percentage
<b>Cutting of umbilical cord</b>	
Knife or pocket knife	0
Razor blade	1 (3%)
Scissors	31 (86%)
Machete	0
Other	0
Don't know	4 (11%)
<b>Care of umbilical cord</b>	
If anything was put on cord	13 (47%)*
<b>Cleaning the baby</b>	
The baby was cleaned after birth	35 (97%)
The newborn was bathed after birth	32 (89%**)
<i>Temascal</i> was used for baby	8 (22%)

\* What was used was mainly: ointment, alcohol and cotton.

\*\*the average age at which the baby was bathed was 1 to 2 hours after birth.

In 86% of the cases the umbilical cord was cut with scissors. Something was put on the cord, such as ointment, alcohol and/or cotton, in almost all the newborns, 97% of the babies were cleaned after birth, and 89% were bathed, in most cases between the first and second hour after birth. 22% of the newborns were bathed in *temascal*.

*“...And the baby lived for three days. Since he was not suckling, and I told them, as we had been told, give him boiled water, and I said, it's better if I put her in her guipil to keep her warm, I said, because the baby did not have full term..., and also give it boiled water, that's why they recommended that to us, not so much trying, I said. And I had him bathed in temascal and I said to put it in its guipil when it got out of the temascal. When I arrived next day I was told that it had already died...”* (Valeria, 25 years old, Momostenango)

*“...I'll bathe you at one [o'clock] she said (the midwife)...but the midwife did not come until 5 in the morning, she didn't come to see me at that time, it wasn't until then that she came to bathe me*

*and she also bathed the baby and that same day the baby started to get sick and died. We don't know if it was the temascal or something else, who knows what happened..."* (Felisa, 35 years old, Momostenango).

## **2.1 Maternal Lactation**

Due to the fact that there were only 36 babies in this study, who were born alive and died during the first 7 days of life, and out of these not all received mother's milk, no tables of the results will be shown, but only a description of the findings.

Of the 36 babies born alive, only 13 lactated mother's milk (37%). This low percentage of maternal lactation among the live births may be due, among other causes, to the fact that 19 of them died before 12 hours of life.

*"...and that's why my little girl could not stand it, said the lady to the girl. They gave her panela water since she could only swallow two little swallows, she didn't suckle at all, and they couldn't get her out again, because there was no time left because she only lived for four hours and died."* (Margarita, 23 years old, Momostenango)

They thought they didn't have enough milk to give them

*"The baby only cried about one night, and he had no other illness; and me too, my teats have no milk, I only gave him boiled water..."* (Antonia, 35 years old, Nahualá)

Or that the newborns did not get anything because their general status was compromised.

*"...But since I was left listless, I just let her suckle, but she no longer wanted to suckle. I told the midwife - why doesn't she want to suckle? When the midwife told me my daughter had the measles and was boiling with a lot of fever..."* (Juliana, 35 years old, Momostenango)

The mothers let the babies suckle from 5 minutes after birth until a maximum of 24 hours after birth, the average being 5 hours. Four of these did not get anything after the first suckling. Eight were given water, *panela* water, cinnamon water, barley water, coffee or *chiricoria* syrup.

The newborns were given mothers' milk from 1 to 12 times in 24 hours, the average being 4.4 times in 24 hours. Only one mother gave milk more than 8 times per day to her baby.

When mothers of the live births were asked what other liquids or foods they had given their babies (in case they did not get mothers' milk, aside lactating), 19 (53%) replied that they had not given anything to the baby. 16% gave them water and 31% gave them other liquids such as herbs, coffee, regular milk and alka seltzer.



**I. DIAGNOSES OF CASES, ACCORDING TO THE PANEL OF EXPERTS AND THE ALGORITHMS**

**Table 38.** Diagnoses of the stillborns according to the panel of experts (n=101)

Fetal Dx.	Obstetric Dx.	Total No.	%
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Asphyxia	Abnormal presentation	26	25
Asphyxia, Premature	Hemorrhage in 3 <sup>rd</sup> . Trimester	9	8
Asphyxia	Prolonged labor	7	7
Asphyxia	Abnormal presentation, hemorrhage in 3 <sup>rd</sup> . Trimester	5	5
Asphyxia, Premature		4	4
Asphyxia	Abnormal presentation, Pre-eclampsia	4	4
Asphyxia, premature	Twin pregnancy, abnormal Presentation	3	3
Asphyxia	Intrauterine fetal death	3	3
Asphyxia	Abnormal presentation, Corioamnionitis	2	2
Asphyxia, premature	Abnormal presentation	2	2
Asphyxia, premature	Premature rupture of membranes, abnormal present.	2	2
Asphyxia	Pre-eclampsia, hemorrhage 3 <sup>rd</sup> Trimester	2	2
Asphyxia	hemorrhage 3 <sup>rd</sup> trimester	1	1
Asphyxia	premature rupture of membranes	1	1
Asphyxia	Cephalus-pelvic disproportion	1	1
Asphyxia	Pre-eclampsia	1	1
Asphyxia, congenital malformation	Polihidramnios	1	1
Asphyxia	prolonged labor, abnormal presentation	1	1
Asphyxia	abnormal presentation,pre- eclampsia,hem. 3 <sup>rd</sup> .Trim.	1	1
Asphyxia	Cord circular,hem. 3 <sup>rd</sup> . Trim.	1	1

Asphyxia, congenital malformation	Prolonged labor	1	1
Asphyxia, premature	twin pregnancy	1	1
Asphyxia, Big	prolonged labor	1	1
Asphyxia	Pre-eclampsia, prolonged labor	1	1
Asphyxia, Big	Distosia at birth, pre-eclampsia	1	1
Asphyxia	Cord prolapse, abnormal presentation	1	1
Asphyxia, congenital malformation	Prolonged labor, hemmorage at 3 <sup>rd</sup> . Trimester	1	1
Asphyxia, congenital malformation	pre-eclampsia, severe anemia	1	1
Asphyxia	Circular at neck, pre-eclampsia, abnormal present.	1	1
Asphyxia	Acute fetal suffering,abnormal pres.prolonged labor,hem.3rd.trim	1	1
Asphyxia	Circular at neck,pre-eclampsia, prolong.labor, hem. At 3 <sup>rd</sup> . Trim.	1	1
Asphyxia, retardation in intra-uterine growth		1	1
Chronic Asphyxia, post-maturity		1	1
Asphyxia without obstetric diagnosis or defined cause		10	11

The diagnoses obtained were based on the review of each of the interviews by the panel of experts, where the complications mentioned by the mother, the open history and some demographic data and obstetric history were of the greatest relevance.

Table 35 shows the frequency of each of the different diagnoses determined by the panel of experts for stillborns. The high number of stillborns is notable, which showed diagnoses of asphyxia and abnormal presentation (26%), since these, in principle, are preventable deaths with good care during delivery. This might possibly be applied to those that showed prolonged labor (7%) and other diagnoses found in the stillborns. Further it might explain, at least in part, the high number of stillborns found in the study, as compared to the estimates and accepted ratios.

**Table 39. Diagnosis of live births, per panel of experts (n=36)**

Obstetric Dx.	Fetal Dx.	Total No.                      %
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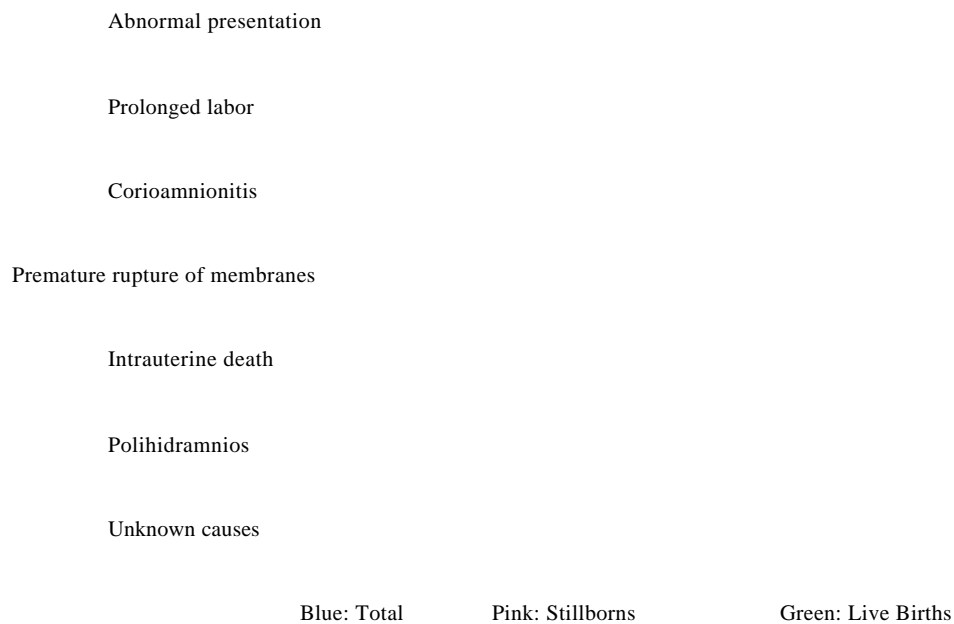
Prolonged labor	Premature	4	11
	Sepsis	3	8.3
Prolonged labor	Asphyxia	2	5.5
Abnormal presentation, Corioamnionitis	Sepsis	2	5.5
Twins	Premature	2	5.5
	Sepsis	2	5.5
Pre-eclampsia	Premature	1	2.7
	Sepsis, premature	1	2.7
Abnormal presentation	Asphyxia	1	2.7
Pre-eclampsia	Asphyxia	1	2.7
Hemorrhage in 3 <sup>rd</sup> . Trimester	Asphyxia	1	2.7
Abnormal pres., pre-eclampsia	Sepsis	1	2.7
Abnormal pres., hemorrhage 3 <sup>rd</sup> . Trimester	Asphyxia	1	2.7
pre-eclampsia	Premature, sepsis	1	2.7
hemorrhage 3 <sup>rd</sup> . Trimester	Asphyxia, sepsis	1	2.7
Premature rupture of membranes, corioamnionitis	Sepsis	1	2.7
Corioamnionitis	Premature	1	2.7
Prolonged labor	Asphyxia, low birth weight	1	2.7
Abnormal presentation, hemorrhage in 3 <sup>rd</sup> trimester	Premature	1	2.7
Twins, hemorrhage 3 <sup>rd</sup> trimester	Low birth weight, sepsis	1	2.7
Corioamnionitis, hemorrhage 3 <sup>rd</sup> . Trimester	Premature, sepsis	1	2.7
twins, Corioamnionitis, premature rupture of membranes	Premature, sepsis	1	2.7
	Sepsis post-term	1	2.7
	premature, congenital malformation, trachea-esophagus fistula		
	Low birth weight, retardation of intra-uterine growth	1	2.7
	Congenital Malformation, Trachea-esophagus fistula	1	2.7

Undiagnosed		1	2.7
	<b>Total</b>	36	100

Table 39 shows the diagnoses assigned to the 36 live births who died during the first 7 days of life. Most of these, aside from a neonatal diagnosis, also have an obstetric diagnosis, a complication of the mother during pregnancy/delivery, which in great part determines the result for the newborn. There is an obvious connection between maternal conditions and those of the newborn during the early neonatal period. [praecox]. Ten newborn were not assigned obstetric diagnoses at all (28%), of whom 4 were premature, 3 had sepsis, 2 had congenital malformations, and 1 low birth rate and intrauterine growth retardation. All of these are causes of death described in this age group.

### Graph 20

**Total number of times that the panel of experts assigned each of the obstetric diagnoses (n=137) to stillborns and live births**



In the group of stillborns, it should be noted that 45% had an abnormal presentation, this being the most frequent diagnosis. In 22% of the cases there was hemorrhage at the third trimester, 15% had prolonged labor, and 10% had pre-eclampsia.

In the group of live births who died, the most frequent obstetric diagnosis was that of prolonged labor (22%), followed by abnormal position and hemorrhage in the third trimester, both being 17%.

The most frequent diagnoses, in total, are abnormal positions (37%) hemorrhage in the third trimester (20%) and prolonged labor (17%)

### Graph 21

**Number of Times that the Panel of Experts assigned to each one of the neonatal diagnoses (n=137), stillborns and newborns**

Asphyxia

Sepsis

Low Birth weight

Large

Chronic Asphyxia

Unknown Causes

0      20      40      60      80      100      120

Blue: Total

Pink: Stillborns

Green: Live Births

This graph shows the neonatal diagnoses of the stillborns, live births and total. The diagnosis of asphyxia stands out, as it was present in all cases of stillborns (100%). This is followed by prematurity, present in 20% of the cases.

Among newborns, sepsis, prematurity and asphyxia were the principal diagnoses encountered in 42, 39 and 33% of the cases. Low birth weight was diagnosed in 3 live births.

Of the total diagnoses, asphyxia was the most frequent (82%). 25% were premature and 11% had sepsis.

### Graph 22

**Number of obstetric and neonatal causes stillborns (n=111) diagnoses issued by the panel of experts**

80  
60  
40  
20  
0

Obstetric

Neonatal

Blue: None

Pink: One

Yellow: Two

Green: Three or four

Of the 101 mothers of stillborns, the panel of experts could not identify a possible obstetric cause of death in 16. The presence of an obstetric and neonatal death was the most frequent, in 54% and 71% respectively. 26% of the mothers showed two causes of obstetric deaths and 29% two causes of neonatal deaths. 4 mothers had three or more causes of obstetric deaths.

### Graph 23

**Number of obstetric and neonatal causes, for live births who died, according to the panel of experts (n=36)**

25  
20  
15  
10  
5  
0

Obstetric

Neonatal

Blue: None

Yellow: One

Pink: Two

Purple: Three or more

In the group of live births who died, the distribution of the causes of obstetric and neonatal deaths was similar to that of stillborns. 33% of the mothers of live births did not have a defined obstetric cause of



death, and only 1 newborn did not have a neonatal diagnosis. 25% showed one cause of obstetric death and 61% one cause of neonatal death. 25% showed two obstetric causes and 33%, two neonatal causes. Differently from the stillborns, none of the live births showed three or more obstetric diagnoses and only one live birth had 3 or more neonatal diagnoses.

## J. STEPS RELATED TO SEEKING HELP DUE TO COMPLICATIONS ARISING DURING PREGNANCY, DELIVERY AND NEONATAL PERIOD

The complications included in this section are not all those mentioned in the table of complications. Only those causes of complications during pregnancy, delivery and neonatal period were included, where it was considered that the mother should seek help. For each of these complications, the seeking of help process was completed (This includes treatment at home, and the process of seeking help outside the home), according to the model “Road to Survival”

**Table 40. Number of Complications in the Search for Help during Pregnancy, Delivery and Neonatal Period for Stillborns and Live Births who Died.**

Number of Complications (n=101)	Stillborns	Live Births who Died (n=36)	Total (n=137)
Complications during pregnancy			
0 Complications	15 (15%)	6 (17%)	21 (15%)
1 Complications	38 (38%)	11 (31%)	49 (36%)
2 Complications	26 (26%)	11 (31%)	37 (27%)
3 or more Complications	22 (22%)	8 (23%)	30 (22%)
Complications during delivery			
0 Complications	35 (35%)	15 (42%)	50 (36%)
1 Complication	36 (36%)	11 (31%)	47 (34%)
2 Complications	28 (28%)	7 (19%)	35 (25%)
3 or more Complications	2 (2%)	3 (8%)	5 (4%)
Complications of the Newborn			
0 Complications	-	0 (0%)	0 (0%)
1 Complication	-	4 (11%)	4 (11%)
2 Complications	-	8 (22%)	8 (22%)
3 or more Complications	-	24 (66%)	24 (66%)

Keeping in mind the complications about which the mother might have sought help, we can see that the

number of complications (in %) present during pregnancy is similar to the group of stillborns as well as in those live newborns who died. Only 15% did not show complications, while the majority had between 1 and 3 complications.

During the delivery, the ratio of women who did not show complications is higher than during pregnancy, 36%. The live births who died showed fewer complications during delivery than the stillborns (42% and 35% respectively). Most, however, showed from 1 to 2 complications during delivery in both groups.

In the live births who died, the distribution of the presence of complication is somewhat different. There was no case that did not have at least one complication, and the majority of the newborns had more than 2 complications (up to 8 complications).

**Table 41. The Road to Survival in Stillborns during pregnancy and Delivery (n=101)**

Step	Pregnancy		Labor	
	No.	Percentage	No.	Percentage

1. Showed no complications	15 (of 101)	(15%)	35 (of 101)	(34.7%)
2. Recognizes the problem	86 (of 101)	(85%)	66 (of 101)	(65.3%)
3. Provides care at home	11 (of 86)	(12.7%)	29 (of 66)	(44%)
4. Seeks help outside home	48 “	(55.8%)	59 “	(89.4%)
5. Use of formal community Services	25 “	(29%)	10 “	(15%)
6. Use of informal community Services	18 “	(20.9%)	47 “	(71%)
7. Mixed use of formal and informal services	5 “	(5.8%)	2 “	(3%)
8. The provider renders care	46 “	(53.4%)	57 “	(86.3%)
9. Follows all recommendations given by the provider	27 “	(31.4%)	31 “	(47%)
10. The provider gives referral	17 “	(19.7%)	17 “	(25.7%)
11. Referral is complied with	12 “	(13.9%)	12 “	(18%)
12. Receives care in the referral service	12 “	(13.9%)	12 “	(18%)

This table summarizes the most important steps of the “Road to Survival” model in the stillborns included in the study (n=101). Each one of the 11 steps (from 2 to 12) included in the table are going to be described in greater detail in the following tables. As a summary table, it shows each one of the most important decisions and actions taken by the mothers who had some complication during the pregnancy and the delivery. In order to understand the table and the graph, it is important to keep in mind that when mention is made of formal community services, these include services ranging from the health center to the hospital (reference is made to the first contact the mother had with the health system) The referral center can also range from the health center to the hospital, depending on who saw her and where she was referred to.

During pregnancy, 86 mothers recognized some problem (of the problems identified, for which she should seek help). Of these 86 mothers, only 12.7% received some treatment at home, while the remaining 87.3% did not do anything to treat her at home. 55.8% sought help outside the home, using mainly formal health services (health posts, community clinic, private physician, hospital) in 29%, followed by informal community services (midwives) in 20.9%. Both services (formal and informal) were used by 5.8% of the mothers who sought help outside the home.

Of the women who were seen by some health provider, 95.8% received some kind of care, while only 56.2% of the mothers followed all the recommendations. Of the mothers who were seen by some health provider, 35.4% were referred (19.7% of all the mothers with some complication). Of the total of mothers with some problem during pregnancy, only 12 mothers (13.9%) arrived and received care at a referral center.

66 women (65%) of the 101 who had stillborns, identified some complication during delivery. Of these, 44% received some care at home and 89% of the mothers went to look for help. Most used informal health services (midwives), receiving some kind of care (96.6%). Only 52% of the mothers who were seen by some health provider did all they were told by these, 26% of the mothers who sought help were referred to another health care center. 70% of the mothers who were seen by some health provider complied with the referral. Of the total of mothers with some complication during delivery, 18% arrived at a referral center and were seen there.

**Table 42. The Road to Survival in pregnancy, delivery and first 7 days for live births who died (n=36)**

Step	Pregnancy		Delivery		First 7 days of life	
	No.	Percentage	No.	Percentage	No.	Percentage

1. Does not recognize any problem	6 (of 36)	16	15 (of 36)	42		
2. Recognizes the problem	30 (of 36)	83	21 (of 36)	58	36	100
3. Provides help at home	2 (of 30)	6	10	“ 48	14	39
4. Seeks help outside home	15	“ 50	14	“ 66	10	28
5. Use of formal community Services	6	“ 20	3	“ 14	9	25
6. Use of informal community services	7	“ 23	11	“ 52		
7. Mixed use of formal and informal services	2	“ 6.6	1	“ 4.7	1	2.7
8. The provider renders care	13	“ 43	14	“ 66	10	28
9. The provider makes referral	3	“ 10	2	“ 9.5	1	2.7
10. The referral is complied with	2	“ 6.6	1	“ 4.7	1	2.7
11. Receives care at the Referral service	2	“ 6.6	1	“ 4.7	1	2.7

The most important steps contained in the “Road to Survival” model are summarized in the table, in the 10 steps for live births who died in relation to the pregnancy, delivery and the newborn.

Of the 36 mothers included in the study who had a live newborn who died in the first 7 days of life, 83% recognized some problem during the pregnancy. Only 6% of these mothers received some kind of treatment at home. 50% of the mothers sought help outside the home from a health provider, the informal sector being the most sought after. 43% of the mothers received some kind of treatment from a formal or informal health provider, and only 10% of the mothers who were seen were given referrals, 10% of the total of mothers with some complication. There were referrals and care at the referral center in 6.6% of the cases.

During delivery 58% of the mothers identified some problem during delivery. 48% of these received some kind of care at home, and 66% of the mothers sought help outside the home, the informal health services being the sites they went to with greater frequency. All the mothers who sought some kind of health provider, received some treatment. Only 14% of those who were seen by some provider received

referrals, which represents 9.5% of all the mothers who had some problem during delivery. Of the total number of women with problems, 4.7% accepted the referral. All of these received some kind of treatment at the referral center.

All the mothers of the newborns identified some complication, although only 28% sought help outside the home. Unlike the search for help due to pregnancy and delivery problems, the newborns were taken mainly to formal services (only 1 newborn was seen by the midwife). In only 1 of the 10 cases who were seen by some health provider was by referral, which represents 2.7% of all births.

The 10 newborns who were seen by a health provider, received a total of 12 treatments. 33% had their stomach or heartbeat examined. 2 babies were placed in incubators and 25% received some type of pharmacological medication.

**Table 43. Persons who Realized that there were Complications During Pregnancy and Delivery, which resulted in stillborns.**

Person	Complications during pregnancy (n=162)		Complications during delivery (n=95)	
Mother	150	(92%)	87	(91.5%)
Someone else	4	( 2.4%)	6	( 6.3%)
Midwife	2	( 1.2%)	2	( 2.1%)
Health worker	6	( 3.6%)	-----	

Of the 101 mothers who had a stillborn baby, 86 presented a total of 162 complications during pregnancy. In 92% it was the mother who realized that there were complications. Midwives and health workers only realized complications in 5% of the cases.

During delivery, a total of 66 mothers presented a total of 95 complications. Like in the pregnancy, it was the mother who in most of the cases (91.5%) realized the complication. The midwife only realized the problem in 2% of the complications.

**Table 44. Persons who Realized Complications during Pregnancy, Delivery and the Neonatal Period, Resulting in a Live Birth who Died**

Person	Complications during pregnancy (n=63)	Complications during delivery (n=34)	Complications in neonatal period (n=137)
Mother	57 (90.4%)	27 (79.4%)	105 (76.6%)
Someone else	3 (4.7%)	3 (8.8%)	24 (17.5%)
Midwife	1 (1.6%)	4 (11.7%)	8 (5.8%)
Health workers	2 (3.2%)	-----	-----

Of the 36 mothers who had a newborn who died, 30 showed 63 complications during pregnancy. In 90% of the cases it was the mother who identified the problem.

21 mothers presented a total of 34 problems during delivery. These complications were identified by 79% of the mother and only 12% by the midwife. During the neonatal period, all 36 cases included, presented complications, a total of 137. The mother realized the complication in 77% of the cases, someone else (husband, relative or neighbor) in 17.5%, and the midwife in 6% of the complications.

In general, it was seen that the mother is the person who most frequently identified the problems arising during pregnancy, delivery and with the newborn.

**Table 45. Average Duration of Complications and Time it took to seek Help in Stillborns**

Duration	During Pregnancy		During Delivery	
	Time it took to seek help*	Duration of the complication	Time it took to seek help*	Duration of the complication
Less than one day	14 (21%)	8 (5%)	45 (77.6%)	43 (45.7%)
From 1 to 3 days	4 (6%)	30 (18.5%)	12 (20.7%)	26 (27.6%)
From 4 to 7 days	4 (6%)	11 (6.8%)	1 (1.7%)	5 (5.3%)
From 8 days to 1 month	10 (15%)	22 (13.5%)	—	8 (8.5%)
From 1 to 2 months	9 (14%)	19 (11.7%)	—	1 (1%)
From 2 to 4 months	9 (14%)	24 (15%)	—	—
More than 4 months	16 (24%)	48 (29.5%)	—	—
<b>Total</b>	<b>66</b>	<b>162**</b>	<b>58</b>	<b>94**</b>
<b>Average</b>	<b>8 days to 1 month</b>	<b>2 to 4 months</b>	<b>Less than 1 day</b>	<b>1 to 3 days</b>

\* The sum of the column “time it took to seek help” is lower than “Duration of the complication”, since not all mothers who identified some complication, sought help for same.

\*\*One mother did not know the duration of the complication either during pregnancy or during delivery.

The mothers of stillborns had 163 complications during pregnancy, an average of 1.9 complications per mother. One of the mothers did not know the duration of this complication. The duration of the 162 complications varies, although there was a tendency that it would be long. Only 5% of the complications lasted less than one day, 25.3% up to one week, and 38.8% up to one month. The remaining 61.2% presented complications for over one month, and of these, 52.7% presented complications for more than



4 months. Not all mothers who presented some problem sought help. During the 162 complications during pregnancy, only 66 complications (41%) sought help. The time at which they sought help varies, from less than one day up to more than 4 months. The moment in which the mother decided to seek help has no relationship with the duration of the complication, which is why the first and second column have no correlation. The average duration of the complications during pregnancy was from 2 to 4 months, and the seeking of help for these was, at an average, between 8 days and one month of having the problem.

During delivery, 66 mothers of stillborns presented 95 complications. One mother did not know how long the complication had lasted. These complications, in 45% of the cases, lasted from less than 1 day in 45% of the cases, to up to 3 days in 73%. Distinct from the problems during pregnancy, the problems during delivery were of short duration. Eight mothers mentioned that there had been heavy bleeding or hemorrhage between 8 days and 1 month. Prolonged bleeding is because in the questionnaire did not differentiate bleeding at the time of birth and post-partum. One mother indicated having had a longer delivery than normal of 1 to 2 months duration. This estimate was possibly due to the presence of contractions during the last trimester of the pregnancy, interpreted by the mother as labor pains. During delivery, the average duration of complications was from 1 to 3 days, and seeking help occurred, on an average, less than 1 day after the problem arose.

Distinct from the complications during pregnancy, the problems during delivery were grouped together, the time for seeking help being determined for all complications. 60 mothers sought help, of whom 2 did not know how much time it had taken them. The remaining 58 mothers sought help, in most of the cases (77.6%) in less than 1 day, and 20.7% between 1 and 3 days and one person mentioned that she sought help between the 4<sup>th</sup> and 7<sup>th</sup> day of complications.

**Table 46. Average Duration of Complications and Time it Took in Seeking Help in Cases of Live Births who Died**

Duration	Complications during Pregnancy		Complications during Delivery		Complications in Neonatal Period	
	Time it took in seeking help**	Duration of complication	Time it took in seeking help**	Duration of complication	Time it took in seeking help**	Duration of complication

Less than 1 day	9 (31%)	2 (3.2%)	13 (93%)	15 (45%)	7 (70%)	65 (50%)
From 1 to 3 days	2 (6.8%)	9 (14%)	1 (7%)	13 (39%)	3 (30%)	53 (40.7%)
From 4 to 7 days	2 (6.8%)	8 (12.7%)		3 (9%)		12 (6.3%)
From 8 days to 1 month	5 (17%)	9 (14%)		2 (6%)		
From 1 to 2 months	2 (6.8%)	3 (4.8%)				
From 2 to 4 months	5 (17%)	11 (17%)				
More than 4 months	4 (13.7%)	21 (33%)				
Total	29	63	14	33*	10	130*
Average	1 to 2 months	2 to 4 months	Less than 1 day	1 to 3 days	Less than 1 day	1 to 3 days

\* Does not include all complications, since for 1 complication during delivery and 7 of the newborn, the mother did not know the duration of same.

\*\*The sum of the column “time it took in seeking help” is lower than that “duration of the complication”, since not all mothers who identified some complication sought help for it.

\*\*\*The time it took in seeking help for complications during delivery and the newborn were not identified for each complication individually, but were done for a group of complications that the mother or the newborn had.

Thirty of the mothers who had a live newborn who died, presented 63 complications during pregnancy, an average of 2.1 complications per mother. 44% of these complications lasted less than 1 month, while 56% were present during one and 4 months. 15 mothers sought help for 46% of these complications, there not being a defined pattern regarding the time it took to seek help. The average time for seeking help is from 1 to 2 months after the start of the problem, the average duration of the complications during pregnancy being from 2 to 4 months.

21 mothers presented 34 complications during delivery (average of 1.6), of whom 1 mother did not know the duration of these. The duration of the 33 complications, in 90% of the cases, was less than 3 days. 3 of the complications mentioned by the mothers lasted more than 3 days, referring to heavy bleeding or hemorrhage for periods of 7 days to one month (in the questionnaire there was no distinction made between heavy bleeding during delivery and post-partum). Due to the fact that the delivery occurred in a short time period, the mothers (who might have had between 1 and 3 complications during delivery) were asked the time it took them to seek help for all the complications as a whole mentioned by them. That is why the numbers of the columns do not agree. 14 mothers sought help, most in less than 1 day after the problem arose. The average time it took them to seek help was from 1 to 3 days after the problem arose.

The 36 live births included in the study presented 130 complications, with an average of 3.6 complications per live birth. 91% of the complications lasted less than 3 days, and 50% less than 1 day.

Seeking help was determined as it was for deliveries, by grouping together all the complications mentioned by the mother (up to 7) and asking the time it took to seek help for all the complications as a whole. Also, in this case, seeking help occurred in the first 3 days in 100% of the complications.

It should be pointed out, both for mothers who had a stillborn, as well as those who had a live birth who died, that in spite of the fact that most of them identified some problem or complication, this was not always perceived as serious or dangerous, or there were other socio-economical factors that made it impossible to take immediate action (seeking help).

In the open histories of the mothers, one could find some examples. These others identified the absence of fetal movement during pregnancy, but did not interpret these as danger signs, which is why no help was sought. Nor was the absence of fetal movement associated with the birth of her stillborn.

*“...When I was pregnant, I had nothing, nothing was hurting me. After I had labor pains, when the baby was born, because when I was pregnant I did not feel any movement. The only thing that hurt me was my stomach and the midwife helped me to cure that pain, she rubbed me and bathed me in temascal. Who was to know that the baby would be born dead?...”* (Aura Estela, 16 years old, Momostenango).

Seeking help late and the permanence of the problem during pregnancy or the pre-partum period (hemorrhage) and not seeking help (diarrhea) are frequent conducts found and related to mothers included in the study.

*“...When I was pregnant, my stomach got swollen and I had cough and fever. When I was 3 months pregnant I had hemorrhage, three months I had it. Well, one month after it started, my husband took me to the doctor, and twenty days before the baby girl was born, I had [loose] bowel movements, I had them for 20 days until the baby was born...”* (Leona, 29 years old, Momostenango).

The complications that occurred during the days of the delivery or even inducing labor pains, frequently were not identified by the mother as being serious.

*“...What happened to me was that I had hemorrhage four days before the baby was born and after the baby was born, and what I did was to take temascal baths. Since I did not know that I was pregnant, I thought that I was menstruating, but I did have back pains and it was labor pain, and I was thinking what is that?...”* (Emiliana, 20 years old, Momostenango).

*“...Now with the last baby, the complications I had was that I had a heavy white flow and also just 3 days before when I had liquid and then the baby was born and when the liquid came down I didn't do anything, I just waited and the baby was born...”* (Tomasita, 32 years old, Momostenango)

Not only was there no identification of a danger symptom, that is why help was not sought, or it was sought late, but also one must keep in mind environmental factors of the mother, such as for example, her limited possibility of responding, during the absence of her husband.

*“...I would have liked for the baby not to die, but since the father wasn't there, he was on a trip, and when he came, he asked what happened? And he said he would take him to the hospital so that they would put him in an incubator, but he got very sick and died.”* (Isadora, 34 years old, Momostenango).

**Table 47. Home care for Complications during pregnancy, delivery, and the live newborn who died, for stillborns and live births.**

Home Care	During pregnancy (n=116)	During delivery (n=87)	Neonatal period (n=36)
Traditional medicine, Natural remedies*	11 (6.7%)	8 (8.8%)	8 (20%)
Self-medication**	22 (13.5%)	4 (4.4%)	5 (12.5%)
Injections	5 (3%)	2 (2.2%)	—
Massage or rubbing	4 (2.4%)	2 (2.2%)	—
Temascal	6 (3.7%)	6 (6.6%)	1 (2.5%)
Bed Rest	3 (1.8%)	5 (5.5%)	—
Changes in diet	3 (1.8%)	2 (2.2%)	2 (5%)
Destinism (Fate)	1 (0.06%)	—	—
Tried to revive	—	—	2 (5%)
Nothing	103 (63%)	48 (52.7%)	22 (55%)
Others	5 (3%)	14 (15.4%)	--
Total	163 (100%)	91 (100%)	40 (100%)

The table refers to the number of care given at home, which is why the sum of the different columns does not correspond to the “n”, which refers to the number of women.

\*Includes herb and grass teas, coffee, water

\*\*Self-medication: pills, tablets, vitamins, syrups, analgesic, antacids, ointments

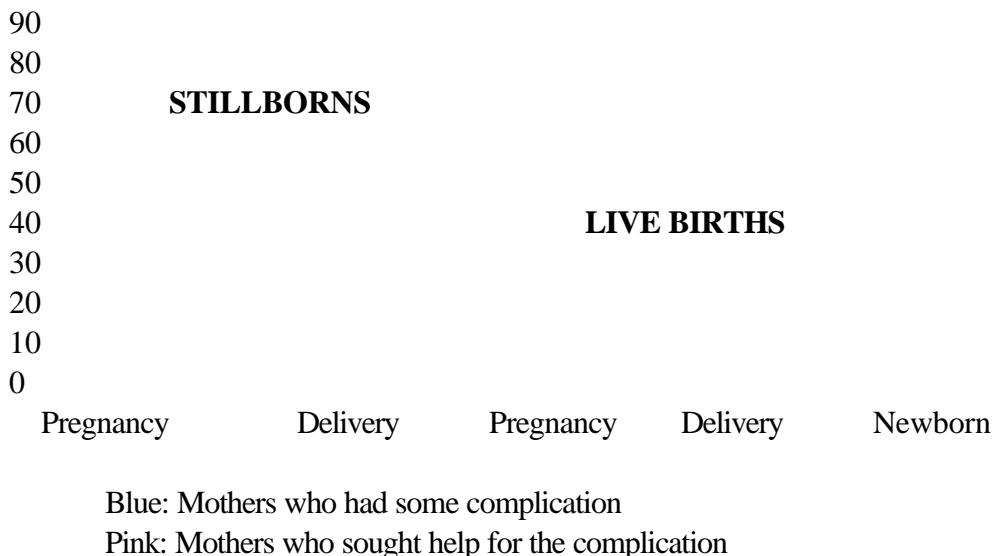
116 of the mothers interviewed had some problem during pregnancy (this includes stillborns and live births) and out of these, 60 mothers received some treatment at home. Most of the mothers presented and identified some problem during pregnancy (63%) and did not do anything at home to treat it. The most frequently mentioned treatments were the use of medications, natural remedies or traditional medicine, massage or rubbing, and temascal.

Of the 87 mothers who recognized one or more complications during delivery, 52.7% did not do anything at home to treat these problems (48 mothers). Of the mothers who did something at home to treat the complication, most (93%) administered one treatment and 7% up to three different treatments. Among the most frequent treatments were bed rest, traditional or natural medicine, temascal and others.

55% of the mothers who had a live baby did not provide any care for him at home, once the problem(s) was(were) identified. 31% gave one treatment and 8% two different treatments. The most frequently mentioned treatments were traditional medicine and medications.

**Graph 24**

**Mothers who identified some complication during pregnancy, delivery or with the live newborn, and who sought help outside the home.**



Not all women who had some complication during pregnancy, delivery or with the newborn sought help outside the home. Of the mothers of stillborns or live births who died, close to 56% and 50% respectively sought help during pregnancy. During delivery it was observed that the mothers of stillborns sought help in 89% of the cases, as compared to 66% of mothers of live babies.

Problems during delivery led to a greater search for help by mothers, as compared to that during pregnancy and the newborn baby. The seeking of help outside the home for complications with the newborn is the lowest, only 27%. A possible explanation for this could be the rapid evolution of the illness of the newborn (53% died before 12 hours after birth), the non-identification of the seriousness of the problems of the baby, and negligence.

*“...We did not cure him because suddenly this illness came upon him. We did nothing to him because he was very small, but the baby already had the illness, because his mother had gotten sick with a cough, that’s why she passed that on to the baby” (Cristina, 22 years old, Momostenango)*

*“...And since the baby was born here at home, but because the placenta could not come, the*

midwife neglected the baby, did not cover him up. There he was crying and since they took me to the hospital, maybe nobody covered him up, then I think he died of cold, it was just negligence, nothing else.” (Juana, 18 years old, Momostenango)

**Table 48. First site where help was sought inside and outside the community for complications during pregnancy and delivery in the cases of stillborns (n=101)**

Resource	Pregnancy Number of complications (68)		Delivery Number of mothers (60)		Total
	Within the community	Outside the community	Within the community	Outside the community	
Midwife	24 (35%)	6 (8.8%)	37 (61.6%)	12 (20%)	79 (62%)
Maternity clinic	—	—	—	—	—
Health post	12 (17.6%)	7 (10.3%)	1 (1.7%)	—	20 (15%)
Clinic	—	1 (1.5%)	—	—	1 (0.008%)
Private physician	—	10 (14.7%)	—	—	10 (7.8%)
Hospital	—	2 (3%)	—	6 (10%)	8 (6.2%)
Other*	4 (5.8%)	2 (3%)	3 (5%)	1 (1.7%)	10 (7.8%)
<b>Total</b>	<b>40 (58.8%)</b>	<b>28 (41.2%)</b>	<b>41 (68.3%)</b>	<b>19 (31.7%)</b>	<b>128</b>

\* Includes Project, private clinic

48 mothers of stillborns sought help outside the home for 68 complications they had during pregnancy. The sum of the persons/sites where they went to is greater than the total number of mothers, since one mother could have more than one complication, and for each complication during pregnancy she was asked where she had gone. In 58.8% of the complications, the mother sought help in the community, the midwife being the person most frequently gone to (35%). Outside the community, the private physician was the provider most frequently consulted by mothers (14.7%), followed by the health post and the midwife.

For complications during delivery, the sum of the number of times that they went to each one of the sites for health assistance is equal to the number of mothers seeking help, since for all complications the mother had during delivery (up to a maximum of three complications), only one site was identified for seeking

help. Most of the women sought help inside the community (68%). Of these, 90% went to the midwife. The remaining 32% sought help outside the community, it also being the midwife (63%) who gave the greatest assistance to these mothers. Distinct from the pregnancy, during delivery the greatest number of women went to the hospital for care. None went to the health post.

The trend that can be observed during pregnancy and delivery is maintained when one considers the last column. Women sought help mainly from the midwife (62%), then the health post, the private physician and the hospital.

**Table 49. First site where help was sought inside and outside the community for complications during pregnancy, delivery and neonatal period in cases of live births who died**

Resource	Pregnancy No. of com- plications (26)		Delivery No. of mothers who sought help (14)		Neonatal period. No. of mothers who sought help (10)		Total
	within the community	outside the community	within the community	outside the community	within the community	outside the community	
Midwife	9 (31%)	1 (3.4%)	11 (78.5%)	—	1 (10%)	—	21 (39.6%)
Maternity clinic	—	—	—	—	—	—	—
Health post	5 (17.2%)	6 (20.6%)	—	—	—	1 (10%)	12 (22.6%)
Clinic	—	—	—	—	—	—	—
Private physician	1 (3.4%)	1 (3.4%)	—	—	1 (10%)	1 (10%)	4 (7.5%)
Hospital	—	—	—	2 (14.3%)	—	3 (30%)	5 (9.4%)
Others	2 (6.8%)	1 (3.4%)	1 (7.1%)	—	2 (20%)	1 (10%)	7 (13.2%)
Total	17 (58.6%)	9 (31%)	12 (85.7%)	2 (14.3%)	4 (40%)	6 (60%)	53

The 15 mothers of babies who were born alive and who died (who had problems during pregnancy), went to some health center for assistance 26 times (they had more than one complication during pregnancy and for each one of the complications they identified the site where the mother went to). In 31% of the complications, the mother sought help within the community, from the midwife and in second place was the health post.



For problems during delivery, the (n) is equal to the number of women who sought help, since all the complications arising during delivery were grouped together and they were asked about the site they went to for all of these. Of the 14 women who sought help mainly within the community, 79% went to the midwife. Only 2 women sought help outside the community, at the hospital.

For care of the newborn, 10 mothers sought help for the problems identified in their newborn babies. 40% sought help within the community and 60% outside same. Within the community, they went to the midwife, private physician and others. Outside the community, most went to the hospital, followed by the health post, private physician and others.

**Table 50. The principal recommendations that the first health provider gave the mother who came due to complications during pregnancy, delivery and the newborn.**

Principal recommendations	Pregnancy (n=111)	Delivery (n=74)	Newborn (n=9)
Nothing	22 (19.8%)	13 (17.5%)	2 (22%)
Traditional medicine, natural remedies	9 (8%)	5 (6.7%)	—
Medications, pills, syrups	22 (19.8%)	1 (1.3%)	5 (55%)
Injections	3 (2.7%)	—	—
Massages or rubbing	1 (0.9%)	—	—
Temascal	3 (2.7%)	1 (1.3%)	—
Bed Rest	11 (9.9%)	10 (13.5%)	—
Change of diet or food	4 (3.6%)	—	—
Praying, awaiting God's will	1 (0.9%)	—	—
Seeking medical provider	21 (18.9%)	19 (25.6)	1 (11%)
Was told to push	—	12 (16.2%)	—
Attended during delivery	—	2 (2.6%)	—
Surgery	—	1 (1.3%)	—
Other	13 (11.7%)	6 (8%)	1 (11%)

This table summarizes the principal recommendations that the first provider made to the mother (it includes only what the mother remembered and mentioned spontaneously). The 63 women who had complications during pregnancy received 110 recommendations. 22 mothers (19.8%) said they had received no

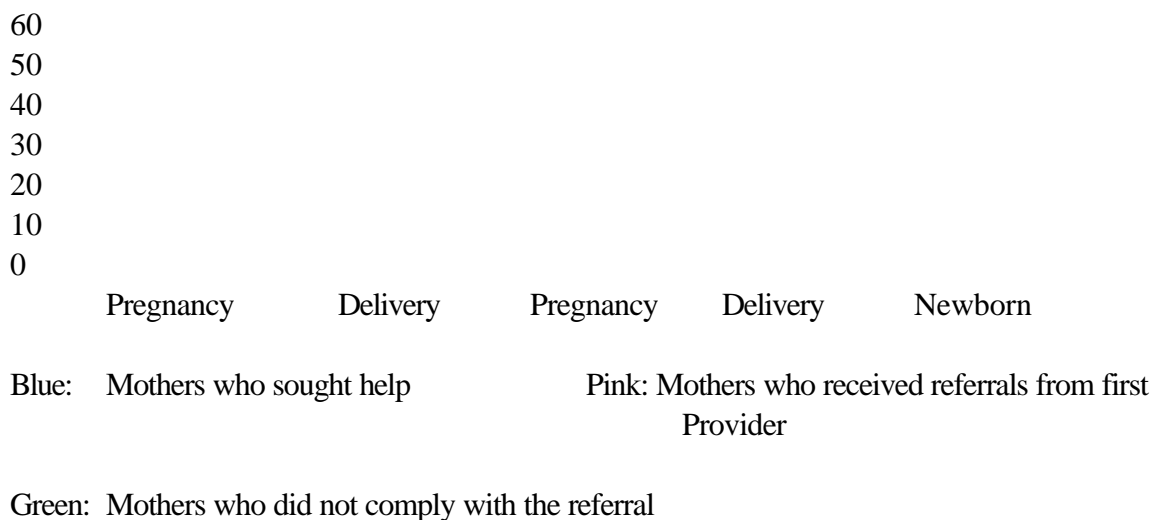
recommendation at all from the health provider. The principal recommendations were medications or pills (19.8%), referral to a medical provider (18.9%) and bed rest (9.9%).

The 74 women who went to a health provider regarding some complication during delivery, received a total of 70 recommendations. 17% did not receive any recommendation. The principal recommendations were referrals to a medical provider (25.6%), telling the mother to push (16%) during the delivery and that the mother should have bed rest (35%).

For the newborns, 5 received the indication of taking some medication, pills or syrup, for two there were no suggestions, and in one case the indication was to seek a medical provider.

### Graph 25

Mothers who received referrals from the first provider who was consulted regarding complications during pregnancy, delivery and the newborn and those that complied with the referrals.



The referral by the health provider who was consulted by the mothers, both in the case of stillborns as well as live births, is low in both groups. The compliance with the referral is higher in the group of mothers of stillborns. 70% accepted the referral during pregnancy and delivery. For mothers of live births who died, the number of referrals is much lower, although percentagewise 66% complied with the referral during the pregnancy and 50% (1) at delivery. Only 1 newborn of the 10 seen by some health provider received a referral and complied with it.

If one considers the open histories of the mothers, it would seem that in a great number of cases, the referral, especially if given during delivery, was late, when one is already facing a complicated delivery that is difficult to manage, possible fetal suffering or even fetal death and an important deterioration of the

mother's condition. These deliveries were attended in most part by midwives. This, however, is not clear in all cases, whether the midwife could have made referrals to the mother with sufficient time, since very often she was called when the delivery is already ongoing and there is no possibility of referrals at that time.

*"...at around 4 in the afternoon, my water broke, so I said that he was about to be born, I said, and Thursday went by and until Friday...was the midwife there? Yes, she was, she told me that he was coming straight, [feet first] she tried to fix it, but...nothing. What am I to do? She said and night came, but like my husband said, she has always had babies here, so we will give her some shots she said, and they did. After an hour of the shots, when his hand came out and his head was like that, yes, that's what happened to him, first the hand and it wasn't until they saw the hand that they took me to the hospital, since they said that I would give birth at home, they weren't sorry, she will give birth here they said..."* (Dominga, 34 years old, Momostenango)

**Graph 26**

**Number of mothers who followed all the recommendations of the first health provider they consulted**



Blue: Mothers who were given recommendations by the first provider

Pink: Mothers who followed all the recommendations

The purple [sic] column shows the mothers who were seen by some health provider, and who, due to complications during pregnancy, delivery and the newborn, were given some recommendation. When the mother was asked whether they were able to do everything that had been recommended, we see that for the pregnancy and delivery, both in the group of stillborns, as well as live births, close to 50% responded in the affirmative. This means that close to 50% of the mothers did not do everything that had been suggested by the health provider they had consulted. For live births who were seen by some provider, the percentage is slightly lower, only 40% of compliance.

**Table 51. Reasons for not complying with recommendations made at the first level of care**

Reason	Pregnancy (n=12)*	Delivery (n=8)*	Newborn (n=1)
Did not have money	3 (25%)	—	—
There was nobody to take her	1 (8.3%)	—	—
Did not trust her/him	2 (16.6%)	—	—
Thought she would get better, lack of knowledge about her own health	3 (25%)	—	—
It's not their custom to go	2 (16.6%)	—	—
She is afraid, ashamed	2 (16.6%)	—	—
She got better, she looked/felt better	—	3 (37.5%)	—
There was no time, the baby died	—	1 (12.5%)	1 (100%)
Family member was not in agreement, did not trust her/him	—	1 (12.5%)	—
Other (1) 8.3%)	3 (37.5%)	—	--

\* From the total (n) we subtracted those that did not respond to this question. During pregnancy there were 28 persons who did not follow all the recommendations, to 25 of these, the question was not applicable to them, in 4 cases they did not answer and in 3 cases it was left blank. During delivery, in 15 cases the question was not applicable, in 6 cases they did not answer and there are 6 blanks. Of the live births who died, in 2 cases the question was not applicable and 2 did not answer. The (n) are all the answers given, no reference is made to the number of women who did not answer the question.

Among the mothers who followed all the recommendations given by the health provider during pregnancy, 25% said it was due to lack of money...

*“Early in the pregnancy she was vomiting and spitting for 3 months, her legs and feet were swollen. She was told to go to the health post. And she went there and they said to go to the hospital, because the illness was dangerous. But she was stubborn, and couldn't go due to lack of money, and since in her other pregnancies everything went well, that's why she thought that this, her pregnancy, was normal. And the people in the neighborhood said that the swelling [indicated] she*

*to have a good delivery...*” (Antonia, 38 years old, San Carlos Sija.)

...and because she thought she would get better, or due to lack of knowledge about her own health. This latter was a relatively frequent appraisal of the group of primigesta women (more obvious in the open history), who, since this was their first experience, did not know not only the possible complications during pregnancy and delivery, but also the severity of these and the need for treatment and the urgency at a certain moment in time. The lack of trust in formal health services, the fear and/or shame, are other frequent reasons mentioned by mothers.

*“...the doctor said that the stomach of my wife was inflamed because she had a lot of liquid and the pregnancy was not going well, and that is why her stomach was inflamed, but since she was afraid first, that they would operate on her, and also because of lack of money, that was why...”* (Catalina, 30 years old, Comitancillo)

*“...And I had cramps and then I had a high fever and headache and I stopped eating because I didn't feel like eating, and my feet and face and hands got swollen, and I went to the health center in Comitancillo and the doctor told me to go to the hospital, but I did not go, I just put my trust in God, and only God I said to myself, and I gave birth here at home, God helped me because just the same I gave birth,...”* (Maria, 27 years old, Comitancillo)

The reason for not following all the recommendations during delivery were due to the fact that in 37.5% of the cases, the mothers were feeling or looking better. Other reasons mentioned were the lack of time (the [birth] process was too fast) and the lack of trust/disagreement of some family member with the recommendation.

In newborns, we have only one case where not everything was done as recommended by the provider, and this was due to the fact that there was no time, the evolution of the illness was too fast.

**Table 52. Actions that were taken when it was not possible to follow the recommendations given at the first level of care**

Actions taken by the mothers	Pregnancy (n=6)*	Delivery (n=5)*
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Change of diet	1	-
Nothing	5	-
She was seen at delivery	-	2
Massages and rubbing	-	1
<i>Temascal</i> baths or massages	-	2

The (n) refer to the total number of answers and not the number of women. In the answers relating to pregnancy and delivery, 7 and 3 women, respectively, did not answer.

When the mothers were asked about those actions that were taken to treat the problem during pregnancy (only those mothers who did not follow all the recommendations given by the health provider), the majority did not do anything. A high number of mothers did not answer that question.

During delivery, the actions mentioned included *temascal* baths and care during delivery.

**Table 53. Reasons why medical help was not sought for complications during pregnancy, delivery and the live newborn who died**

Reason	Pregnancy (n=157)*	Delivery (n=65)*	Newborn (n=34)	Total (n=256)
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Did not have money	26 (16%)	12 (18.5%)	3 (8.8%)	41 (16%)
Lack of knowledge about her reproductive health and complications	19 (12%)	6 (9.2%)	—	25 (9.8%)
Barriers to access to health services (distance, transportation, bad weather, language)	24 (15%)	6 (9.2%)	6 (17.6%)	36 (14%)
It is not their custom to go ,distrust in services, fear, shame	34 (21%)	14 (21.5%)	—	48 (18.8%)
Thought she would get better, was feeling better	16 (10%)	5 (7.7%)	3 (8.8%)	24 (9.4%)
Bad quality of care at health services	9 (5.6%)	—	4 (11.8%)	13 (5%)
Husband or family member did not agree	6 (3.7%)	3 (4.6%)	—	9 (3.5%)
She was seen by the midwife or other traditional provider	5 (3%)	7 (10.7%)	1 (2.9%)	13 (5%)
Special prayers or ceremonies	6 (3.7%)	—	—	6 (2.3%)
There was no time	3 (1.8%)	12 (18.5%)	16 (47%)	31 (12.1%)
She felt too weak to go	—	1 (1.5%)	—	1 (0.003%)
Did not believe she would improve	—	—	1 (2.9%)	1 (0.003%)
Others	6 (3.7%)	—	—	6 (2.3%)
Don't know	3 (1.8%)	—	--	3 (1.1%)

\*Regarding the total number of reasons for not going when faced with a problem during pregnancy and delivery, there were 2 and 5 mothers, respectively, who did not answer that question.

During pregnancy, the 78 mothers who did not go to a nurse or physician mentioned a total of 157 reasons for not going. During delivery, 71 women mentioned 65 reasons (5 did not answer) and 27 mothers of live births who died gave a total of 34 reasons. All the reasons mentioned by the mothers are grouped together in Table 46.

The last column shows the sum of the different reasons mentioned by mothers. The most frequently mentioned reason both during pregnancy and delivery (not mentioned in live births who died) was the absence of such custom, distrust regarding health services, fear and/or shame (18.8%) . The perception that the health services do not provide quality care, was mentioned frequently among the reasons for not going, in the open histories.

*“But two days before the delivery the doctor from the health post came to see me and she told me that my baby was already dead and she told me to go to the hospital. But I didn’t believe her. I thought that she was lying to me and I thought I would spend a lot of money. When you know how much it costs to have a car take you, and since I was seven months pregnant, I didn’t think that my baby was going to be born already.”* (Erminia, 20 years old, Momostenango)

*“...and I didn’t take long. At around twelve I felt better and didn’t go to the health post, because they do not take care of us there...”* (Vicenta, 34 years old, Momostenango)

*“..When the time came for the delivery, it didn’t take long. My baby threw himself twice in front of us in the temascal. What did they do to help him? We didn’t do anything to him, since he was just born...and she said she didn’t want to go to the health post because she felt ashamed. If she had wanted to go, maybe he wouldn’t have died...”* (Antonia, 24 years old, Nahualá )

Access barriers are both distance, transportation, bad weather, language, as well as the lack of money (here they separate into two groups). The lack of money is one of the most frequently mentioned reasons in the three groups, in total, 16%), and access barriers for a total of 14%. If all the barriers considered as “access” are added, these represent 30% of the reasons why they did not go to a formal health service.

*“...When I would go to control, the midwife would tell me that I have to go to control at the health center. But I didn’t go, it is too far...”* (Berta, 35 years old, Comitancillo).

The lack of time is an important reason, especially during labor, as well as with the newborn. Once labor has started, it is more difficult, in a short time, to identify the danger and organize transportation. Among live births it may possibly be due in most cases to the rapid evolution of the illness in most of the cases and not detecting the danger signs in a timely fashion.

*“And they also told her to have bed rest and when time comes for the delivery it has to be in a hospital, because she works hard and lifts heavy objects, that’s why she has hemorrhage. And for bed rest she went home, but when she started labor there was no time to call the hospital nor to call the midwife. That’s why her mother-in-law took care of her...”* (Odilia, 27 years old, Momostenango)

The lack of knowledge about reproductive health and complications was mentioned frequently by mothers during the open history (most were primigestas). Also, the non identification of the seriousness of the complications (she thought she would get better, she was feeling better) represents 9.4% of the reasons mentioned.

*“During the pregnancy, nothing was hurting me, I didn’t have anything. Since I don’t know about these things, since this is my first baby: and at delivery I started labor at around 12 at night in the early morning hours of Monday and the baby didn’t get born until Wednesday at 11 in the morning. When I started labor pains, I didn’t say anything, I thought, these things happen, but I really*



*couldn't stand it all day Monday, I didn't say anything, then my sister in law realized it maybe and they called the midwife and that's all I can say, I don't remember..."* (Maria, 21 years old, Momostenango)

5% of the reasons given by the mothers made reference to the poor quality of the care given at the health services. They preferred to be seen and treated by another provider, usually a midwife. The quotes in the narrations do not necessarily refer to why they did not go to a medical provider, but rather to the bad experiences they have had at the health center.

*"Well, yes, when I was pregnant I had pains and that's why I went to the health center. But it's the same thing, they don't solve anything there. What I did was look for another midwife so I would get better..."* (Felisa, 35 years old, Momostenango)

Prayers and putting themselves in God's hands is another reason mentioned by the mothers in their open histories, as well as the lack of support by the husband or other family member.

*"...since I didn't go to control at the health post, because my religion does not allow it, and the pastor of the church scolds us, that's why I didn't go to my control at the health center; also, my husband doesn't want it, he says that only God has the power."* (Cecilia, 19 years old, Momostenango)

*"...because we are Evangelical, or will they ask for a prayer? What are we to do right now? He said. And they told me "are you going to the hospital?" and I said no, if I die here, let me die, I won't go, I said. And what are we to do? They said, and they went to call a brother and they prayed with me and God said to my husband and now she is in danger and they believed in Him and then, a while later, after the prayer, first the water broke...and since it was midnight and the baby was already dead when he was born, and his head was sort of trembling or pulsating, they said, since I didn't see..."* (Dominga, 26 years old, Nahualá)

Poor condition of the mother, especially in the post-partum stage, frequently conditioned referrals. This has been observed in the open histories.

*"...when the midwife came, "he's already dead", she said. That's why you are pushing a lot, he can no longer be born" and he was born. It doesn't matter that he is dead, if he had been born fast, but no, he was stuck and that's why it was so hard for me to give birth. I didn't feel when it happened,. I fainted, I fainted for about an hour, for about an hour he stayed there.."* (Francisca, 35 years old, Momostenango)

*"...but she just gave me a shot for the hemorrhage, since the baby had already been born and after the baby was born I felt weak, my vision was clouded, and I had chills, and I started to vomit and bowel movements, and that's why the midwife gave me the shot, and little by little I got over it..."*

(Maria, 25 years old, Momostenango).

## CHAPTER 4:

### DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

#### A. DISCUSSION

Maternal and perinatal health are closely related, which is why they share the greatest number of risk factors. Babies or newborns have a greater risk of dying if the maternal age is extreme, socio-economic conditions and educational levels are low, the maternal health conditions are poor, care during pregnancy is inadequate, care during delivery is inappropriate or performed under poor sanitation, and there is no adequate care of the newborn. Also, it is considered that both maternal as well as perinatal mortality are indirect indicators of the quality of health services, since in general they are higher where access to the health services, especially prenatal control and care during delivery, are poor. 1,2

This study was carried out in four rural communities in Guatemala: Momostenango, Nahualá, Comitancillo and San Carlos Sija. Calculations to obtain the number of expected deaths per community were based on estimates of international figures of the proportions of stillborns and live births who died during the first 7 days of life, 2 as were the neonatal 55 and infant 6 death rates. The under-recording of perinatal deaths and little information in general about these, 2 justify the development of this study, which has mostly a community orientation, and provides useful tools to determine the principal causes of death, as well as the most important breakdowns in the “Road to Survival” model, which allows us to determine possible interventions to decrease perinatal mortality in the communities of the study. During the period included in the study (6 months, from December 1997 to May 1998), it is surprising that 80% of the cases were identified through civil registration records. However, this high proportion of death and birth records, has been described in other studies, where estimates as high as 90% or more are given for this ratio in Guatemala. 12,56 The total number of perinatal deaths included in the study are similar to those expected, where, according to estimates, you take the number of cases recorded and have between 28% and 5% more cases. It should be pointed out that in the community of Momostenango, where approximately 35% more cases were identified than those estimated, these were mostly stillborns. Also, it is the community where 53% of all the cases of the study were identified, it also being the community with the highest population. However, when comparing Momostenango to the other communities included in the study, there did not seem to be any apparent difference in the population nor in the access or use of health services.

Most of the women included in the study are of Indigenous [Indian] ethnicity, which is why it was impossible to make comparisons with the *ladino* population. However, there were differences between bilingual women (30%) and monolinguals (70% Mam or K’iche’), and some comparisons were made

regarding the use of health services, since different studies carried out in Guatemala identified language as the most important barrier for the use of health services.<sup>8,13,57</sup> 59% of the women had no education, most being monolingual (66%). The age of the mothers was between 15 and 41 years old, the greatest proportion of the cases (31%) being in the group of 20 to 24 years olds. For 34% of the mothers, the death of the baby included in the study already was the second or more who had died, i.e., stillborns (26%) or live births (27%).

One of the aspects included in the study is the use and access mothers had to the different health providers for complications identified during pregnancy, delivery and the newborn (curative), as well as prenatal control (preventive). The Ministry of Health, since 1970, has established the objective of providing care to the majority of the women in Guatemala, expanding its services to the rural areas. It is estimated that 40% of the population has access to health services.<sup>58</sup> Access to these, especially among the rural and Indian population (43% <sup>59</sup>) varies greatly among the different communities.<sup>13</sup> In rural and Indian communities health services and health staff in general is scarcer <sup>12,15</sup> And the use of “other” providers by women and children, in this case, traditional midwives, is quite common. Although access to different health providers may be adequate in suburban <sup>60</sup> and rural <sup>17</sup> Indian communities, a low use of official health services is observed <sup>60</sup>. The selection of one or another health service seems to depend on a series of factors such as ethnicity, beliefs about the effectiveness of different types of care, accessibility to formal health services, economic and social level of the family and characteristics of the community.<sup>13</sup>

Ethnicity of the mother and the community<sup>17</sup> where they are from, has been associated with the pattern of use of the health services. The low credibility in the model of biomedical cause-disease, preference for receiving care from a member of the same community, distrust towards *ladinos* and the use of midwives as part of their ethnic and community identification, <sup>13,57</sup> are part of the possible explanations. The use of formal health services for prenatal control and care during delivery is lower among Indian women than among *ladinas*<sup>13</sup>, this under-utilization being much more obvious among monolingual women.<sup>8,13,57</sup> This, however, does not agree with the findings of the study, where, in differentiating the use of midwives and the health center/post for prenatal control, the use is similar among bilingual and monolingual women.

The level of education is another factor to be kept in mind, since it has been seen that the higher the level of education, the greater the use of health services in general and formal services in particular (prenatal and delivery)<sup>13,57</sup>. The occupation of the mother seems to be another factor which, through a greater availability of economic resources, acts as a factor toward the use of health services.<sup>17</sup> Due to the fact that the women of the study had similar characteristics, it was not possible to differentiate the pattern of utilization of health services according to the highest level of education attained, nor the occupation of the mother.

Distance to the closest clinic has been related to the use of formal services for prenatal control and care during delivery <sup>13,57</sup>. In a study carried out at the site of the study (Solalá, Totonicapán and San Marcos), access of the population to health services was measured in terms of geographic distance, it being found that it was reasonable in the 188 communities studied.<sup>61</sup> In spite of the presence of a health post/center in

the towns, its access could have been limited due to their hours of operation, low number of health staff, lack of equipment and medicines 13,24,57. The human and material resources existing in health posts/centers frequently are inadequate, which affects the quality of care received by patients. It was found that the low use of health services was due mainly to a poor quality care and not so much to difficulty of access (distance) to same 61 or cultural/anthropological factors mentioned by various authors.13,17 Also, the feeling of discontent regarding the attitude of the health staff towards patients and midwives 24,60 has been identified as an important determining factor regarding the use not only of health posts/centers, but also of hospitals.24.

This study has identified the reason why 78 mothers did not go to a physician or a nurse (formal service) when having complications during pregnancy, delivery or with the newborn. During pregnancy, the principal reasons mentioned were that it was not customary, fear or shame, lack of money or access barriers (transportation, distance, language). The reasons during delivery were similar to those described during pregnancy, although added to them are the acute stages of the delivery itself, the lack of time and the fact that the midwife had already been called. The most important reason for the newborn was lack of time, probably due to the fact that most of the babies died within 24 hours after birth. Mention was also made to access barriers (transportation, distance), the perception that health services are not quality services, the lack of money and the idea that the baby would get better, that it looked better. The difficulties of communication, the fact that formal health providers in general do not speak the Indian language, have been described as an access barrier and have been interpreted by some health sectors as reasons for the preference of the indigenous population to resort to midwives. 6,13,57 Linguistic barriers, however, were not mentioned by the women as important limiting factors for their use. Although they were not asked about the reasons for not going to prenatal control (23 mothers), no differences were found in the use of formal health services or midwives in monolingual women as compared to bilingual women. However, in both groups, the midwife was the principal provider, both for prenatal control as well as for care during delivery. In fact it is estimated that only 17% of the Indian population received prenatal care by a formal health provider.18

This pattern of utilization of health services by Indian women is reflected in national statistics, where 65% of the deliveries take place at home, and in 55% are cared for by a midwife, a percentage which is higher in the rural areas of Guatemala.6 It has been described that the preference of Indian women for midwives is not only because of the obstetric 57 and social role she plays, but also for the rejection they feel from the formal health services.13,25,57,61 Other reasons described are that the midwife generally lives in the community and is accessible at any hour of the day or night 8,13,57 and the cultural nexus.13,14 Certain socio-demographic characteristics have been identified as determining factors for the use of formal health services, of which distance, living in a rural area and equality of the mother play a negative role, while the socio-economical level, exposure to the media, problems during delivery, and risk perceived, play a positive role.62

The use of different health services by Indian women is conditioned to the fact that public and private medical sectors in Guatemala are developing in a parallel and isolated fashion from the existing traditional

systems of belief and treatment. In spite of the fact that there has been an increase in the use of health services, traditional providers continue to be a common source of treatment.<sup>13</sup> One cannot say there is a dichotomy of services, but rather a pluralism of health providers, which means that traditional and formal services are used simultaneously, without contradictions. The degree of complementation between services varies according to the time: pregnancy, delivery or post-partum. During pregnancy the services offered by each provider are perceived differently, also that frequently the midwife makes referrals when there is some complication. This complementation is lower during delivery, where the majority of the women prefer to be cared for by the midwife and in the post-partum period, where the midwife and the family are the principal resources used by the mother.<sup>8</sup>

This pattern of utilization of different health providers can be observed in this study. During pregnancy, and especially for prenatal control, of the 114 women who went to some kind of prenatal care, 93% consulted the midwife at least once, and 58% had at least one consultation with formal health services. 61 women (53%) used both the midwife as well as formal health services, a percentage which is similar to that found in other studies.<sup>8</sup> It is surprising that in women who went to health centers, the average number of consultations was only 2.7. Other studies have described the fact that women usually go to formal services only once, possibly due to problems of access or because they do not feel the need to return if the pregnancy is going well.<sup>8,20</sup> It would seem that they do not consider these services to be preventive, but rather curative: a place one goes to when there is a concrete complication or problem.<sup>20</sup>

The use of different health providers during pregnancy was similar in the four communities. In Comitancillo, only 69% of the women had prenatal control, a percentage which in the other three communities varied between 84 and 100%. This includes midwives as well as the other providers.

In general it can be said that the contact these women had with a health provider during pregnancy was adequate, as was the time in which on average they went for the first consultation, at 5.8 months (second trimester), as per the recommendations of the World Health Organization. The number of problems identified by these women during pregnancy was significant (262), most of which required treatment in order to avoid possible complications with the baby. It should be pointed out that only 25% of the mothers remembered that the health provider, at the time of prenatal control, had told them that their pregnancy was at risk, and that they should be cared for at the hospital. It is also conspicuous that there was low compliance by the mothers with this recommendation, and the reasons for not following such recommendations have already been expounded.

The questionnaire includes some questions which have the intent of monitoring the quality of care received by prenatal care providers, although establishing quality criteria and rating the actions taken, were not included among the objectives of the study. 48% of the mothers who went for prenatal control received some kind of medication, especially vitamins and iron. Although no information was obtained about the application of anti-tetanus vaccine in this pregnancy, 43% had been vaccinated during previous pregnancies. 49% were measured for the height of the abdomen, and 43% had their blood pressure taken. The taking of blood or urine samples was not done frequently, only in 11% of cases. The inclusion in future

studies of quality of care criteria might possibly allow for the identification of the principal problems of care, which has also been proposed by other studies.<sup>62</sup>

Prenatal control has been defined as one of the pillars of a safe maternity. Various studies have shown that routine prenatal control and greater contact with the formal sector does not only allow for a greater detection of problems during pregnancy, but also makes them conscious of the fact that it should be used for care during delivery.<sup>13,15,62</sup> This is important, since according to the best estimates, only 55% of the 125 million annual births in developing countries are cared for by trained providers. This figure may fluctuate between 35% in Africa, 56% in Asia and 76% in Latin America, although it does not reflect the rural-urban differences that can occur.<sup>9</sup> This study has not shown this, however, where more than half the mothers did go to prenatal control and were seen by a formal health provider and only 13% had the baby in a hospital, a great proportion of these were referred due to complications during delivery. Only 4% of the mothers had planned to have their baby in the hospital. The mother alone, or with her husband, are the persons who in most cases decide about where the delivery will take place, although at times the mother-in-law may decide. The midwife was only mentioned in 11 cases as participating in said decision. No mother mentioned the health worker or the hospital as a determining factor for choosing the place of birth. The change of planned site for the delivery was due, mostly, to the presence of a problem during delivery (81%), that there was no time because the baby was being born (11%) and problems during pregnancy (7.4%). For care during delivery, the midwife is still the preferred health care provider by women in rural areas.<sup>8,14</sup> The study found that 79% of the mothers delivered at home, which had been planned as the site by 95%, which agrees with the figures of home deliveries in Quetzaltenango (80%).<sup>24</sup> The official national figures and those of the South-Western area are slightly lower, being 55% and 69% respectively.<sup>6</sup> The use of hospitals is determined mainly by the presence of complications.<sup>14</sup>

Traditional practices surrounding the delivery are reflected indirectly in this study. The clear preference of women to go to a midwife, the high proportion who plan and who do deliver at home, and the descriptions in their open histories, especially about practices associated with delivery, show further that the mix of different health providers at this time is much lower than during pregnancy, which has also been described by other studies.<sup>6,13</sup> It has been said that traditional practices are closely related to the way in which Indigenous women consider their bodies and humoral conditions. This may explain the frequent use of oils or eggs taken to help during delivery and also to induce vomiting, which also facilitates the expulsion of the placenta.<sup>13,14</sup> Among the tales of mothers, these practices were described as necessary and useful at the time of having their baby. The use of injections of oxytocin to accelerate the delivery process is a frequent practice among midwives, in spite of being considered inadequate in their training.<sup>13</sup> Although this study did not ask explicitly about the use of oxytocin, it seems that its use is relatively frequent, since it was mentioned spontaneously by some mothers, both in open questions of the questionnaire, as well as in their narrations. This use of oxytocin can be due to a greater prevalence of complications during the delivery among women in this study.

The corporal conditions of cold and heat are especially important during pregnancy, delivery and postpartum for indigenous women of Guatemala. A pregnant woman considers herself as in a "hot" state, due

partially to the accumulation of blood in her body, passing to the “cold” state during delivery. These two physiological states will condition her diet and her baths during pregnancy, delivery and post-partum. In studying uses of health services for pregnant women, some mothers mentioned the fear that if they went to the hospital the food would be incompatible, that it will be impossible to cover themselves with handkerchiefs and cold water. This aspect, although mentioned by some mothers in their narration, was not covered directly during the interview. *Temascal* baths, before and after delivery, are practices mentioned frequently by the mothers, since these seem to have a curative effect and increase the production of milk.<sup>13</sup>

Aside from the utilization of health services for prenatal control and care during delivery, the survey identified possible problems or complications arising during pregnancy, delivery and the newborn, for which it was decided to seek help, using the model of “Road to Survival”. The signs and symptoms identified by the mother as problems, were also utilized by the panel of experts in order to determine the possible cause of death of the baby.

In order to obtain information about the possible causes of death, open narration and closed questions about the possible signs and symptoms during pregnancy, delivery and the newborn were used. Other studies found that the cause of death could be extracted from the open histories of the interviewee, as the sole instrument,<sup>64</sup> which was not corroborated by this study, since of the total number of symptoms present during pregnancy, delivery and live births, only 43.27 and 18% , respectively, were mentioned spontaneously. The mothers had greater difficulty in identifying some signs and symptoms during delivery (for example, the water was yellow or green, the umbilical cord, the aspect and expulsion of the placenta, etc.), many of which are important in order to determine the possible cause of death of the baby. It is in this section, delivery, where the second informant, if present during delivery, complements the information obtained from the mother.

The panel of experts determined the obstetric and neonatal diagnoses, by using the complications that were experienced during pregnancy, delivery and with the newborn, that had been mentioned by the mothers, the diagnostic algorithms that they themselves had defined for the principal causes of perinatal mortality (see appendix 5), as well as their clinical criteria, open histories of mothers, and other sections of the questionnaire which they considered to be important. Thus, these diagnoses are less comparable with other studies of this kind.<sup>32</sup> However, the determination of possible diagnoses, gives us an idea about the principal causes of perinatal deaths in the four communities of the study, information which is necessary in order to understand the magnitude of the problem and for establishing some interventions tending to decrease this high mortality rate.

The most frequent obstetric diagnoses defined by the panel of experts were: abnormal presentation (39%), prolonged labor (15%) and hemorrhage in the third trimester (20%). The principal neonatal diagnoses were: asphyxia (79%), prematurity (28%) and sepsis (13%). These findings agree with what has been found in another study, where the major contributors to neonatal death in rural areas of Guatemala were abnormal presentation and premature labor.<sup>8,9</sup> The most frequent intra-partum deaths in the rural area of Guatemala, were due to asphyxia or intra-partum trauma,<sup>7</sup> which also agrees with the findings of this study.

Vaginal hemorrhage or bleeding is a symptom that has bearing on maternal and perinatal death 10,11 and has been identified as the principal cause of maternal death among the indigenous population of Guatemala (1986)12. With regard to the newborn, the most frequent complications were low birth weight, prematurity, asphyxia, neonatal sepsis, respiratory infection and tetanus.9 These diagnoses were also frequent in this study, although no case of neonatal tetanus was found. Neonatal tetanus does not seem to be a very frequent condition in Guatemala, although several cases have been reported in studies carried out by INCAP.7

The most frequent neonatal diagnosis was asphyxia, which was present in all stillborns and in 20% of live births. The panel of experts diagnosed three live births with “low birth weight”, based on the mother’s criteria. The maternal perception that the “baby is small” has been associated with neonatal death in other studies 7,9, with the limiting factor that this is a perception and cannot be counted as a trustworthy record to determine the actual weight of the newborn.7 Although this study tries to approximate the sensitivity (85.7%) and specificity (88.7) of maternal perception regarding the size of the baby, when taking the gestational age and not the exact weight of the newborn due to the absence of such a record, thus limiting the results.

As was mentioned early in this discussion, the number of perinatal deaths identified during the period of the study is similar to the expected figures. However, when one disaggregates the total of perinatal deaths in stillborns (50-60% of the total of perinatal deaths) and live births (40-50% of the total of perinatal deaths) and compare these with the expected proportion of each, we can see that the study identified more stillborns (74%) and fewer live births (26%) than expected. This greater number of stillborns could be explained with some of the results obtained in the study, such as:

- 1) High intra-partum mortality: 45% of stillborns had abnormal presentation. Most of these births were cared for at home, and frequently were prolonged and traumatic, resulting in neonatal asphyxia and intra-partum death. The high frequency of abnormal position apparent in this study as a cause of intra-partum death, has already been described in other studies.8,9
- 2) Third trimester hemorrhage was mentioned by 29% of the mothers of stillborns as a complication during delivery, although no differentiation is made between intra-partum and post-partum bleeding. Severe hemorrhage is considered to be an important cause of maternal and perinatal death. In most of the cases, if adequate treatment is given, perinatal and maternal death can be prevented.
- 3) The difficulty of establishing the death of a very depressed newborn, could also explain the high number of stillborns that were found, especially if it is assumed that intra-partum trauma is a frequent condition among these women. The study included, as criteria for fetal deaths, the absence of movement, does not breathe and does not cry, which could occur in a depressed live birth, which is possibly why some newborns classified as stillborns had actually been born alive. The criteria that was mentioned with greatest frequency, spontaneously and equated to sign of death by the mother, was the absence of movement. In establishing with certainty fetal death, one



is required to undergo certain training, and according to the WHO definition, one would have to determine, after the fetus has been separated, that there was no breathing nor any other evidence of life, such as heartbeat, pulsation of the umbilical cord or clear movements of voluntary muscles.<sup>55</sup> Nevertheless, for purposes of an intervention, it is not as important to be able to definitely differentiate stillborns and live births who die within a few hours after birth, since they are considered jointly, both in the rate as well as for possible interventions. They represent a continuum between the mother and the newborn. Interventions, in both cases, are related to actions at the maternal and infant level, without differentiating either of the two groups.<sup>2</sup>

Deaths due to diagnoses of abnormal presentation, hemorrhage during the third trimester and prolonged labor could be considered preventable deaths, if they are detected early and there is quality care during delivery especially if one considers that 77% of the babies of the study were full-term.

In the area of Quetzaltenango, a study of conglomerates identified that in 19% of the cases there were complications, 6% occurring during pregnancy, 8% during delivery and 4% post-partum.<sup>9</sup> Although this study does not have any controls, the absolute number of complications during delivery (262) was greater than the number of complications during pregnancy (243). Many of the complications during pregnancy were not life threatening, such as fever and weakness, among others, while most of the complications during delivery were serious.

When analyzing the process of the mothers' seeking help, only those complications were included, where it was considered that the mothers should seek help during pregnancy, delivery and for the newborn (226, 124 and 137 respectively). It is surprising that it was mainly the mothers who identified the signs or symptoms of illnesses. Midwives only identified the problem during pregnancy and delivery in 3 or 4 cases, respectively, the number being even lower for the health workers. In spite of the fact that the mothers identified the signs or symptoms, most did not recognize the danger signs nor their seriousness. Therefore, the presence of serious complications not always led to seeking help in a timely fashion, which is reflected in the low search for help outside the home during pregnancy (54%). For problems during delivery and with the newborn, help was sought outside the home by 63 of 87 and 10 of 36 mothers, respectively, for the 124 and 137 complications that had been identified. The seeking of help was much quicker than during pregnancy, possibly due to the short duration of the delivery, the rapid evolution of the illness of the newborn and the close relationship to birth. Although a good part of the problems encountered during pregnancy and delivery could have been identified by the mother, there were complications that could only be identified by the health provider, who could therefore determine the management of these. Due to the high proportion of cases found in this study, abnormal position (40%) is the most outstanding example. The risk and conduct, in this case, must be established by the health provider whom the mother sees.

When the seriousness of the symptoms is not identified, this determines what the person or the mother will do thereafter; they may not seek help, they may not give treatment at home, they may seek help late and/or even go to referral services late. The non identification of the seriousness and its potential risk to the life of the mother, the newborn or the baby is a finding described in other studies.<sup>11</sup>

It is suggested that in most societies, the person (usually the mother) has different options when facing an episode of illness, such as care at home, or seeking care from a traditional and/or formal health provider.<sup>13</sup> In studies carried out both among the Guatemalan population as well as in other countries, self-care and treatment at home is part of the management of an illness episode.<sup>13,63</sup> Self-medication seems to be a usual and prevalent practice in rural communities of Guatemala,<sup>63</sup> which is different from the findings in this study, where the mothers, in a high proportion, mentioned that they had not done anything at home to treat the complications that arose during pregnancy, delivery and the newborn (63%, 53% and 55%, respectively). This low utilization of home remedies and treatments may indicate that these are more frequent when dealing with a disease affecting children or adults, rather than that of pregnancy, delivery and newborns (during the first 7 days of life).

An episode of acute childhood illness, as is the case of live births in this study, may determine the seeking for help. It has been described in two Guatemalan communities that there is limited access to health services for acute illnesses.<sup>17</sup> The high proportion of not seeking help for newborns (72%) may be due to the presence of acute short-lived episodes, and due to cultural reasons, similar to those found in other studies.<sup>64</sup>

During the process of selecting and seeking help, it is important to keep in mind that the decision of people, frequently based on rationalization and are non-medical, who do not think in medical terms, but in what is culturally acceptable to them.<sup>24</sup> This process may be based on beliefs of the people and their attitudes, which in turn are determined by factors such as prior personal and family experience of the illness, the management of the illness by health provider(s), information available and the assistance rendered by neighbors, friends or members of the family.<sup>65</sup> In the Indian communities, the use of formal health services has been described as irregular, they possibly may use these in emergency cases only.<sup>13,57</sup>

Midwives were the health providers that were seen most frequently by mothers who had problems during pregnancy and delivery. Formal providers, however, were most often consulted by mothers with a sick infant. For complications during pregnancy, 59% of the mothers sought help within the community itself, the midwife being the provider selected in 29% of cases. The health post was also available within the community, which is why access should not be a determining factor when selecting such services. The other formal services usually were outside the community, which might have conditioned their access. During delivery, the midwife is the principal provider, which explains why there is a preference that birth occur at home and care be provided by someone in the community itself. Seeking help was concentrated within the community (76%). Hospitals are outside the community and the distance mentioned by the women interviewed, using the usual means of transportation, was 2.5 hours, which definitely might mean a limited access to same, especially when labor has already started. When seeking help for the newborn, most did so from a formal provider, there was only one case where there was consultation both by the midwife as well as by a formal health provider.

The mothers who asked for consultations for problems during pregnancy, delivery and the newborn, received some kind of treatment in most cases. The quality of such treatments could not be determined,

since medical records for each of the cases were not analyzed. It is important to note that only 27, 52 and 40% of all mothers during pregnancy, delivery and the newborn, respectively, followed all the recommendations given by the health provider. The principal reasons for not following these recommendations were the belief that they would get better and the lack of knowledge about their own health of the pregnant women, who felt better after giving birth, and that there was no time for the newborn.

Late referral is especially obvious when the actions taken by the mother, midwife and family members are followed when complications arose during delivery. According to the death certificates in Guatemala in 1986, it was found that the death rate of mothers is higher in hospitals in all regions, which was interpreted as due to late referrals to the hospitals, inadequate care and low number of hospital births.<sup>12</sup> In this study, the proportion of deliveries in hospitals was only 13%, of which, more than half arrived with late referrals.

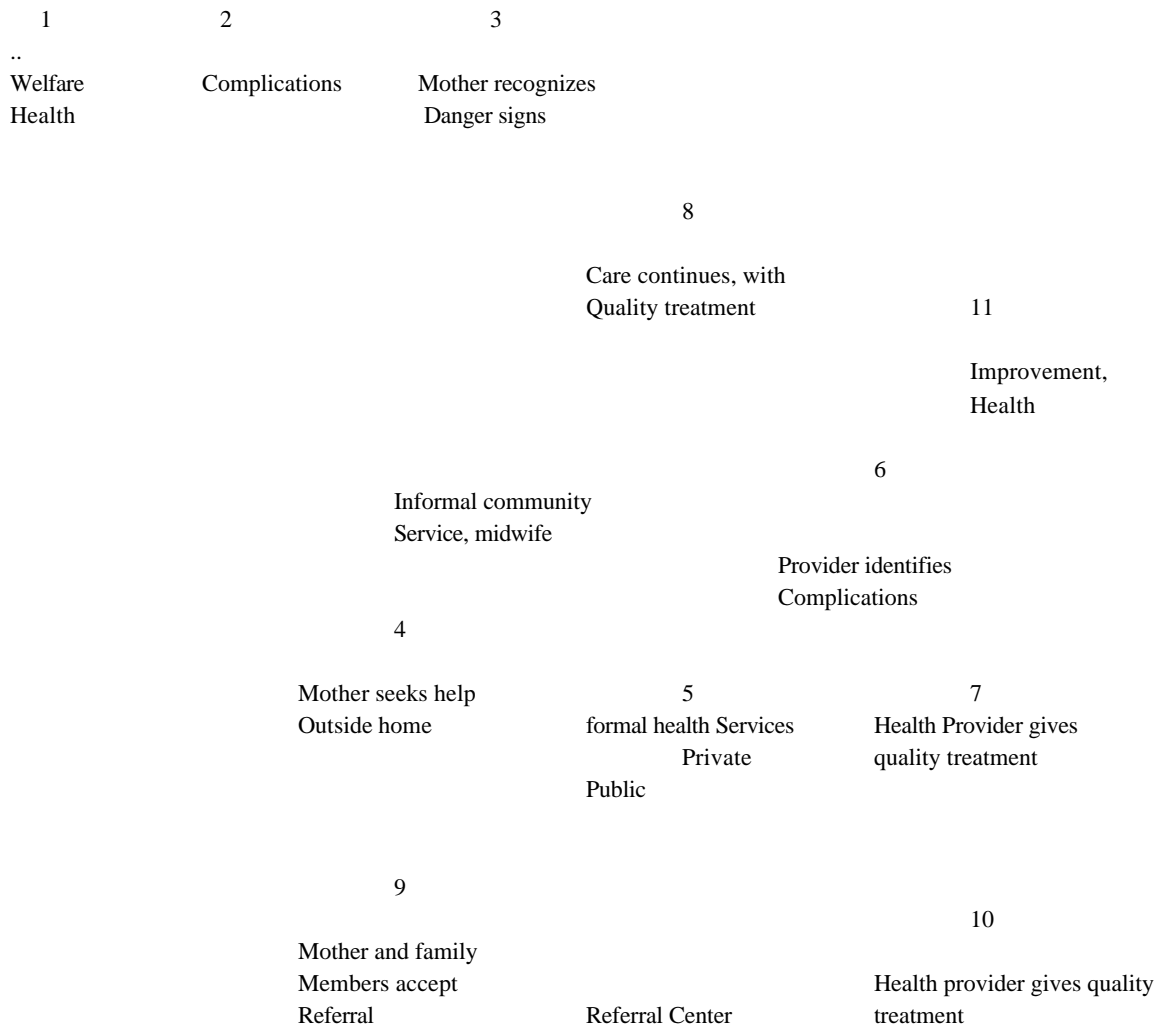
When some complication arises, the midwife is important for making decisions (referral), although family members also participate in it. Nevertheless, there is resistance to going to hospitals among those women who had never gone there before, aside from the difficulty of access to these services, such as distance and transportation, cost of the services and transportation, as well as socio-cultural aspects.<sup>13</sup>

## **B. CONCLUSIONS**

1. The principal obstetric diagnoses of perinatal deaths in the four communities of the study were: abnormal position, third trimester hemorrhage, prolonged labor and pre-eclampsia.
2. The principal fetal diagnoses were asphyxia, prematurity and sepsis.
3. If an intervention were practiced that would only include early detection and adequate management of abnormal positions, the death of approximately 50% of the babies could be prevented in the perinatal period.
4. A high proportion of cases (about three-fourths) might have been avoided and prevented with an early diagnosis of the problem during pregnancy or delivery, aside from an adequate and quality management of the delivery.
5. Going to prenatal control is a common practice for women of this study, during their pregnancy. Prenatal control, however, did not prove to be useful in the detection and management of complications.
6. Being Mayan monolingual is not a limiting factor for the use of formal health services and prenatal control.

7. The midwife is the principal health provider sought by the rural Indigenous population of this study. She is the principal nexus with formal health services, which is why it is necessary that she be included in any intervention tending to decrease perinatal mortality.
8. The principal break-downs in the model Road to Survival identified in the study, and regarding which possible interventions should be identified, are shown graphically in the attached model, adapted to the process of seeking help during the perinatal period. These are:
  - a) The mothers included in this study, identified most of the problems arising during pregnancy, delivery and the newborn, but did not identify their seriousness, nor the need for seeking help.
  - b) Neither the midwife nor the formal health services of the community considered the seriousness of complications during pregnancy and delivery, nor the need for giving referrals to a health service that offered greater capability of resolving the problem.
  - c) The mothers and family members receive referrals, either by the midwife or a health provider regarding identified problems, but frequently do not comply with the referral. This is one of the causes of perinatal death at home or late referral to a hospital.

## Model of the Road to Survival for Perinatal Mortality and Principal Breakdowns



\*Problems during pregnancy, delivery and the newborn

9. Studies on perinatal mortality at the community level, through the use of verbal and social autopsies, are useful and important, since they make it possible to establish presumptive principal diagnoses of death and to identify the principal break-downs in the model of the road to survival.
10. The use of combined research methods (open histories, questionnaires and sheets for seeking help) are complementary and necessary in order to determine biological and social diagnoses of perinatal death. We consider that none of these, by itself, substitutes another, although this is something that should be validated in future studies. These last two conclusions identified possible areas of

intervention, for which it is necessary to delve deeper in them in future studies.

11. No conclusions were reached regarding maternal lactation, due to the fact that most of the newborns died during the first hours of life.
12. In analyzing open histories, the lack of knowledge about reproductive and sexual health, principally among primigesta women, is a limiting factor for detecting problems during pregnancy and delivery, and seeking help.
13. In analyzing the open histories, it can be seen that both the women as well as the midwives, accept the occurrence of a problem or complication as something over which they have no control and cannot intervene. Many of these situations are described as “God’s will”, “fate” and nothing can be done about them.

## **C. RECOMMENDATIONS**

### **1. Components of possible interventions**

- 1 The midwife is the principal health provider for pregnant Indigenous women. She is a human resource that is necessary at the rural level, due to the limited capability of the official health system of providing care during delivery. Therefore, it is important that their training continue, using adult and participative learning techniques, aside from focusing on risks. It is important to develop a system of supervision and evaluation for midwives, as well as support workshops.
- 2 Bringing together health services and midwives is fundamental, since only with teamwork among the different providers can quality care during pregnancy and delivery be ensured. This can be attained through periodic visits of midwives to the services and exchanging experiences with the health staff.
- 3 Due to not only their obstetric role, but also their social and cultural roles, midwives, at the time of caring at the birth, must be allowed to accompany the patient to the hospital (if a referral were necessary). This possibly will not only impinge on the knowledge of the midwife, but also on a greater acceptance of hospital services by the Indigenous patient.
- 4 Cultural sensitivity awareness and training in obstetric management protocols in the health services has had a positive effect on the number of patients hospitalized, and therefore, the reduction of perinatal mortality. Therefore this work should be continued in the health services.
- 5 Women identified the signs or symptoms during pregnancy, delivery and the newborn. However, most of them did not recognize their seriousness, and therefore did not seek help in a timely fashion, nor did they take appropriate actions. At an earlier date, through radio spot announcements,

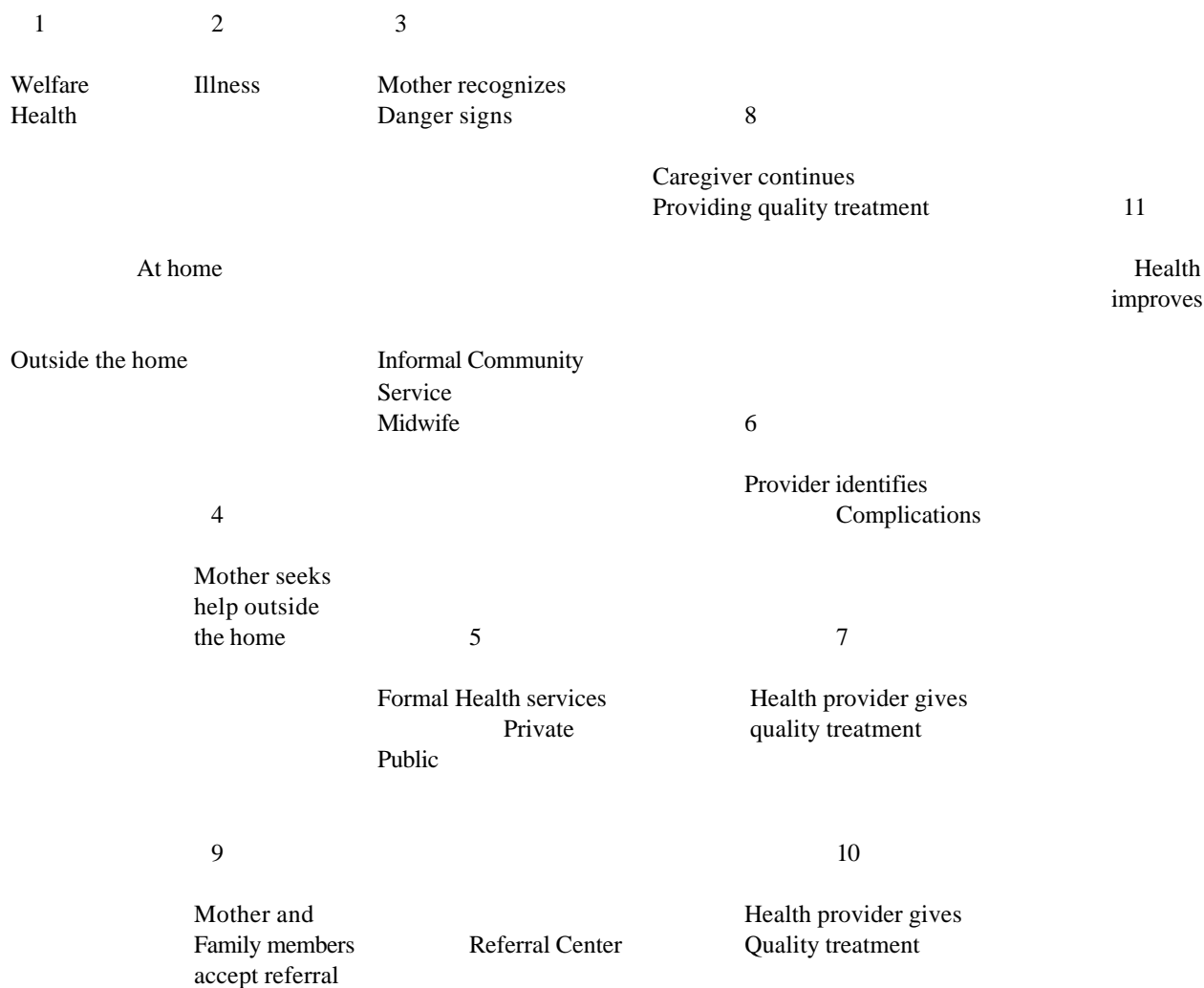
messages about danger signs during pregnancy had been broadcast, which apparently were remembered by a good number of mothers who heard them. Although the radio is a media that has been little explored up to now as a means of disseminating health messages, due to its potential coverage it should be considered for messages that deal with danger signs during delivery and the newborn as well.

- 6 The presence of the principal danger signs should be reinforced in women's groups.
- 7 Through women's groups, especially pregnant ones, supporting the development of emergency plans when a serious problem arises during pregnancy or delivery. For example, bring up the subject that if something happens, where would they go, how much it would cost, who might pay for the transportation.
- 8 Include the husband and other family members as much as possible, since they are important at the time a decision is taken regarding the site of the delivery or the acceptance or not of a referral. This study, as well as others, have demonstrated that frequently the mother cannot make her own decisions, but that she depends on her husband or her mother-in-law.
- 9 Find the best way of supporting community organization and mobilization to improve access and transfer to the hospital, in emergency situations, of the pregnant mother or during the delivery.
- 10 Prenatal control is a common practice of pregnant women in this study. Many of the problems and complications leading to the death of the baby could only be detected by these health providers, such as abnormal positions, twins, or other risk factors of the woman. It is important to reinforce the quality of care of the services or providers who provide prenatal care, concentrating on the principal causes of perinatal mortality. The midwife, who is a health provider accepted by the Ministry of Health for caring for pregnant women, must also be receive support as a nexus between the community and the health services.

## **2. Perinatal Mortality Studies**

- 1 The analysis of the process of seeking help was based on the model Road to Survival. The findings of the study and the fact that the model should be applied to pregnant women, to delivery and to the newborn up to the first 7 days of life, has led to the adaptation of the initial model, pointing out the following changes (see chart)

## Model of the Road to Survival for Perinatal Mortality



\*Problems during pregnancy,  
delivery and the newborn

- a) From this model, the box entitled “Caregiver gives quality treatment at home” (#4) was taken out, since it was considered that no complication arising during pregnancy, delivery or the newborn has a recommended quality treatment at home. It is recommended that for whatever problem that is identified, the mother should seek help outside the home.
- b) One of the problems identified in the study, was that the health provider the mother saw for complications during pregnancy, delivery or the newborn, did not recognize the problem. Without such recognition (for example, abnormal position, twins, etc.) the treatment and the



recommendations can not be of quality. In order to emphasize this step, a box was added, entitled “Provider identifies complications” (#6)

- 2 The diagnostic algorithms defined by the panel of experts should be validated and complemented in future studies of this kind, in order to make comparisons between regions and even between countries.
- 3 For studies concentrating on pregnancy, and especially on delivery as a specially critical moment for the survival of the baby, the second informant is an important source of information. He/she complements the information of the mother, which at times is fragmentary and incomplete. Aside from the open history, the second informant should be included in the questionnaire, with a list of complications during delivery, since many of the findings are only known to the person who was present during delivery.
- 4 In order to complement the data analysis, when such a study is initiated, it should be decided whether or not to include the quality criteria of prenatal and delivery care. As a parameter of comparison, the national standards and international recommendations could be used for comparative purposes with other countries.
5. From the open histories alone, in this study, only a low percentage of problems or complications during pregnancy, delivery and the newborn were mentioned spontaneously, which is why a list of signs and symptoms should be included in the questionnaires. Nevertheless, by means of the open history it is possible to obtain other type of information: a description of the process illness-death from the point of view of the interviewee, which is useful in order to understand the data obtained in the questionnaire, in many cases. Therefore, in the future, aside from the questionnaire, the study should also include an open history and a table of the search for help.
6. An ethnographic study prior to the design of the questionnaire is important, since it allows the adaptation in the questionnaire of questions and even the contents, to the characteristics of the population under study. It assures that the questions and especially the signs and symptoms which are important in order to determine the diagnosis, are understood by the interviewee. Also, it can be used as a tool during the training of the surveyors and will aid in obtaining open histories. Therefore, it is recommended that an ethnographic study be made before the instruments are designed.
7. Although the “Social Autopsy” sheet gathers much of the information contained in the Road to Survival, some loss of information was observed, especially in regard to seeking help and certain actions taken at home, when comparing it to the open history of the mothers. In future studies, this form should be revised, and other choices for collecting information should be weighed, such as taking actions, instead of symptoms.

8. In the training, the application of the questionnaires is fundamental. Due to the fact that the identification of the cases of death and the travel to the interview is complicated, the number of interviews during the training is limited. Thus, consideration should be given to include more “supervised” practices, such as, for instance, visits to hospitals or other health services.

## **BIBLIOGRAPHY**

Translator’s Note: This part contains 68 authors cited and does not need translation

## APPENDIX 1

### ALGORITHMS OF THE PRINCIPAL CAUSES OF PERINATAL MORTALITY

#### 1. Diagnosis of the Newborn

- a) Low birth rate at full term; He/She was very small + (length of pregnancy of 8 or more months)
- b) Premature (was born before term) + (length of pregnancy of less than 8 months)
- c) Sepsis: (did not suckle or suckled well, but stopped suckling) + (stopped moving, dejected) + was cold, got cold)
- d) Asphyxia: (did not breathe) + (was born blue/turned blue or was pale / bad color or suckled well, but stopped suckling, or was crying loudly, but stopped crying)
- e) Congenital malformation: had a physical handicap or deformity
- f) Neonatal Tetanus: (was suckling well, but stopped suckling) + (stopped moving, dejected or fits) + age of newborn of 5 days or more)

#### 2. Diagnosis of the Pregnancy

- a) Pre-eclampsia: (high blood pressure or swelling of hands and face)
- b) Eclampsia: (high blood pressure) + (swelling of hands and face) + (fits)
- c) Third Trimester Hemorrhage: vaginal bleeding or hemorrhage
- d) Corioamnionitis: (the water breaks, water comes before term) + high temperature, fever, chills
- e) Premature labor pain: Labor pain before term
- f) Twins: multiple pregnancy

#### 3. Diagnosis of the Delivery and Labor:

- a) Prolonged labor: (Delivery longer than normal (more than 12 hours) + (pushed for more than 2 hours)

- b) Pre-Eclampsia: High blood pressure
- c) Eclampsia: (Fits) + (high blood pressure)
- d) Hemorrhage: (Heavy bleeding or hemorrhage) or (placenta came out before the baby)
- e) Corioamnionitis: (Water broke, water comes out before term) + (high temperature, fever or chills)
- f) Problem with the umbilical cord: (The cord was expelled before the baby or the placenta was expelled before the baby)
- g) Abnormal presentation: (abnormal position (first the hand, foot, sitting, sideways))
- h) Distosia of the delivery: the delivery was longer than normal (more than 12 hours) or she pushed for a long time (more than 2 hours)

## APPENDIX 2

### QUALITATIVE INVESTIGATION ON PERINATAL MORTALITY

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#### BACKGROUND

In Guatemala, infant mortality rate is approximately 73 per 1000 births. Almost one third of these deaths occur during the first 28 days of life (Shieber et al. 1994). The neonatal mortality rate is 29 deaths per 1000 live births.

It is assumed that more than half the neonatal deaths occur during the first week of life.

The MotherCare/Guatemala Project's mission is to contribute to the reduction of maternal and perinatal morbidity and mortality in Guatemala. To this end, it has identified and established as a goal, an increase of the number of women who will use health services when they have obstetric and perinatal complications.

In October 1997 a qualitative investigation on perinatal death was carried out, prior to a quantitative study on community perinatal mortality. The purpose of this qualitative investigation was to document the knowledge, attitudes and practices of women, midwives and health promoters, with regard to perinatal mortality and, specifically, regarding the death of a baby during pregnancy (obit) intra-partum and during the first 7 days of life of a baby. Also, one of the objectives was to identify the terminology used by the people, when referring to perinatal death and its possible causes.

#### METHODOLOGY

The qualitative study was carried out in four municipalities of Guatemala where the MotherCare project had been operating during the last few years. The four municipalities were: Nahualá (Sololá), Momostenango (Tonicapán), San Carlos Sija (Quetzaltenango) and Comitancillo (San Marcos). Within each of the municipalities, one rural community (*aldea*) was chosen.

#### Sample Selection

In each of the four rural communities, a group of young mothers (18 to 29 years old), older mothers (30 to 39 years old), a group of midwives and a group of health promoters or community workers were invited to participate.

#### Methodology

The methodology used was qualitative and the study specifically used the technique of focal discussion groups.

## **Tools**

One single guide for the focal group was prepared, which was used for all groups. The guide included three main subjects and suggested questions under each subject. The guideline subjects were: 1) pregnancy and the death of a baby during pregnancy, 2) a baby who died at birth or the death of a baby during delivery, 3) care of the newborn and perinatal death.

## **Staff**

The data collection was carried out by 8 field workers (2 per community) who were bilingual in Spanish and the Mayan language of the communities (K'iche' and Mam). The field workers operated in teams of two, one as moderator and the other as reporter of the focal group. The principal investigator acted as trainer and supervisor. These same field workers made the transcription of the data that were tape recorded.

## **Schedule**

The study lasted six weeks, between October and November, 1997. During the first week, a discussion guide was prepared. The training of the field workers took one week. Data collection took one and a half weeks. Since all the discussions were taped on cassettes, these were listened to, translated and transcribed in Spanish by the field workers, during the week and a half. The transcription of the data were typed on Word during the following two weeks.

## **Data Analysis**

The field workers taped all their interviews and meetings of focal groups. The cassettes were listened to, translated and transcribed at the office after the field work was concluded. The transcription of the focal groups was verbatim. All the transcriptions were read in full, and, since the main purpose of the investigation was to obtain information for the preparation of the instrument of the quantitative study, the terms used by people when referring to the death of a baby during pregnancy, delivery and the first 7 days of life were extracted. A complete analysis of this data is still pending.

## **PRELIMINARY RESULTS**

Below is the terminology used by the participants of the focal groups when referring to the death of a baby during pregnancy, delivery and during the first 7 days of birth. This terminology is also available in K'iche' and Mam.

### **Complications occurring during pregnancy**

Does not eat, lack of appetite  
Dizziness, nausea, vomiting  
Lethargy, sleepiness and weakness (suggests anaemia, but did not mention anaemia)  
Anaemia  
Vaginal bleeding or hemorrhage  
White flow  
Urinal disease  
Water breaks, water expelled  
Too much liquid (amniotic fluid) “water ball”  
Swelling of face and hands  
Headache  
Stomach ache, from pregnancy  
Back ache, waist pain  
Cramps in hands or feet  
Heart pain  
The heart seems to jump out, palpitations, fear, scared  
“Pressure” or high blood pressure  
Temperature, fever, chills  
Fits  
Falls, blows, or effort  
Baby stopped moving  
Twin pregnancy  
Cannot sleep  
Diabetes  
Genital ulcers, blotches, weals  
Prior Caesarean section

### **Complications occurring during labor and/or delivery**

The delivery was longer than normal  
Pushed for a long time  
Lack of strength, fainting, weakness  
Heavy vaginal bleeding or hemorrhage  
The water was brown, green  
The water broke more than one day before the delivery  
Swelling of face and hands  
Headache

Tightness of the mother  
Baby is very big  
Cramps in hands and feet  
Heart pain  
The heart seems to jump out, palpitations, fear, scared  
“Pressure” or high blood pressure  
Very cold, trembling  
Temperature, fever, chills  
Fits  
The baby stopped moving  
Twin pregnancy  
Umbilical cord was rolled up  
Dry birth, scant liquid  
Dead baby  
Poor presentation or position (first came the hand, feet, sitting, sideways)  
The baby was preceded by the cord  
The baby was preceded by the placenta  
Dead baby  
Placenta expelled, isn't born  
Tired uterus  
Caesarean

### **Complications of the newborn**

[Evil] “Eye”  
“Re tuj” (*temascal illness*)  
Scare  
Pushing  
The baby was born before its time  
The baby was very small  
The baby was very big  
The baby had physical deformity, handicap  
The baby had a hernia  
Splotches or marks of blows to head or body  
Did not suckle  
Was not strong enough to suckle  
Suckled well, but stopped suckling  
Did not cry loudly  
Cried loudly, but stopped crying  
Sniveling, cried a lot  
Had colic or bad stomach ache



Had cramps  
Got rigid  
Did not respond, dispirited, did not move  
Temperature or fever  
Was cold or got cold  
His fontanelle was convex  
His fontanelle was sunken  
Was born blue or turned blue  
Vomited everything, throwing up  
The navel was red, with matter or pus  
Was pale, bad color  
Red or hot spots on skin  
Did not breathe or strangled  
Had difficulty breathing  
Was born tired  
Breathing very rapidly  
Stopped-up nose, runny nose, grippe  
Congested throat  
Had cough or whooping cough  
His ribs were sunken  
Did not urinate  
Did not have bowel movement  
Loose bowel movement or liquid movements  
Loose bowel movement or bloody movements  
Rash or pimples in the mouth  
Pimples on skin  
Swallowed liquid or hemorrhage, suffocated  
Hoarse, with phlegm  
Sunken eyes  
“Eclipsed” baby