



MOTHERCARE

PROJECT

"ATTENTION FOR MOTHERS AND NEONATES"

SITUATION ANALYSIS

Areas of San Marcos, Totonicapán, Sololá,
Sacatepéquez, and Chimaltenango

Ministry of Public Health and Social Assistance

MotherCare

USAID

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TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	METHODOLOGY	2
	TECHNICAL RECOMMENDATIONS FOR MOTHERCARE PROJECT DEVELOPMENT	6
III.	DEPARTMENT OF SAN MARCOS	10
	A. SOCIO-DEMOGRAPHIC DESCRIPTION	10
	B. RESOURCES AND STRUCTURE OF THE HEALTH SYSTEM IN THE DEPARTMENT OF SAN MARCOS	12
	C. RECOMMENDATIONS	15
IV.	DEPARTMENT OF TOTONICAPAN	25
	A. SOCIO-DEMOGRAPHIC DESCRIPTION	25
	B. RESOURCES AND STRUCTURE OF THE HEALTH SYSTEM IN THE DEPARTMENT OF TOTONICAPAN	27
	C. RECOMMENDATIONS	29
V.	DEPARTMENT OF SOLOLA	36
	A. SOCIO-DEMOGRAPHIC DESCRIPTION	36
	B. RESOURCES AND STRUCTURE OF THE HEALTH SYSTEM IN THE DEPARTMENT OF SOLOLA	38
	C. RECOMMENDATIONS	40
VI.	DEPARTMENT OF CHIMALTENANGO	46
	A. SOCIO-DEMOGRAPHIC DESCRIPTION	46
	B. RESOURCES AND STRUCTURE OF THE HEALTH SYSTEM IN THE DEPARTMENT OF CHIMALTENANGO	48
	C. RECOMMENDATIONS	51
VII.	DEPARTMENT OF SACATEPEQUEZ	59
	A. SOCIO-DEMOGRAPHIC DESCRIPTION	59
	B. RESOURCES AND STRUCTURE OF THE HEALTH SYSTEM IN THE DEPARTMENT OF SACATEPEQUEZ	62
	C. RECOMMENDATIONS	64
VIII.	BIBLIOGRAPHY	69
IX.	ANNEXES	70

I. INTRODUCTION

Health Areas in San Marcos, Totonicapán, Sololá, Chimaltenango, and Sacatepéquez were evaluated in this research. The purpose was to get a general overview of the mother-child health in these areas prior to the Mothercare interventions in the training of traditional birth attendants, and the technical assistance project which will be carried out at the hospital level.

Before actual visits to these areas, an instrument was developed (based on WHO recommendations) to find out about hospital conditions in the previously-mentioned regions.

Also a survey was prepared for staff working in health services and NGO's active and working with birth attendants. This survey explored attitudes and availability to work with the project.

During the research, it was found that national hospitals have a limited budget for medicines, maintenance and support services. Technical capacity for the attention of mothers and children is limited by a lack of qualified medical resources. Also, there is a total lack of protocols for the management of obstetric patients and neonates.

Furthermore, high rates of maternal and child mortality were noticed at the municipal level. Therefore, interventions to be carried out should give priority to those municipios with the highest rates.

A deficiency in the processing of information was also observed at the local and central level. Many technical factors should be improved prior to the interventions so that monitoring can be effective and reflect objectively the project impact.

II. METHODOLOGY

Health Areas in San Marcos, Totonicapán, Sololá, Chimaltenango, and Sacatepéquez were evaluated in this research with the purpose to get a general overview of the areas prior to the Mothercare interventions. (See Map of the Republic of Guatemala).

The main objectives of this evaluation were:

1. Evaluate interest in the health areas to implement the model, and type of contribution they could make.
2. Carry out an inventory of five hospitals, identify location, and select area with proper facilities (select municipalities).
3. Interview health personnel regarding ability to solve obstetric and neonatal problems (number of deliveries, complications, references, etc.)
4. Collect each area records of prenatal control, delivery and admission.
5. Maps of health services.
6. Collect forms "F" with instruction sheet.

This evaluation covered three basic stages before preparation of report:

1. Literature review on geographic and socio-demographic data for the health areas.
2. Visits to the health areas previously mentioned and interviews with Chief of area and Chief nurses in the area and in the hospital.
3. Consolidation of information and preparation of final report.

In the hospitals evaluation, an instrument was developed to weigh and assess existence of basic elements recommended by WHO.

Another instrument was developed on attitudes regarding the project and time working with the Ministry. Also, questions on continuous education received

yearly in the mother-child area were included.

A third instrument was developed for NGO's involved in the training of birth attendants, which included questions on feasibility of future work with the project and main activities of these organizations in the areas. (See Chart No.

1)

CHART No. 1

COLLECTION OF INFORMATION
INE, DGSS, SEGEPLAN, INCAP

VISITS TO HEALTH AREAS

- a. Interview with Chief nurse in the Area
- b. Interview with Chief nurse in the Hospital
- c. Interview with Chief of area
- d. Evaluation of basic elements necessary at hospital level
- e. Review of books on statistics at the hospital and at the health areas.

CONSOLIDATION OF INFORMATION

FINAL REPORT

An effort to explain the most important socio-demographic variables was made so as to obtain a better overview of data collected.

The following annexes are included:

ANNEX 1

1. Instrument for hospital evaluation.
2. Interview with nurses.
3. Interview with NGO's.

ANNEX 2

1. Form "F" used by health areas to tabulate data, and instruction sheet.

ANNEX 3

1. Clinical records used in health centers and posts to collect information on mother-child attention. These are used officially by the Mother-Child Department.

TECHNICAL RECOMMENDATIONS FOR MOTHERCARE PROJECT DEVELOPMENT

1. It is very important that the Ministry of Public Health and Social Assistance improves the quality of statistic data provided. Presently, there are differences between key statistics published by INE and those published by the Ministry regarding record of births: those published by the Ministry tend to be lower.
2. A lack of a continuous systematization in the Data Processing Department of the Ministry of Public Health makes maternal mortality and child rates show an important under-record.

This could be improved in the intervention areas previously mentioned by establishing the "Active Surveillance Systems for Maternal and Child Mortality" which the PAHO/WHO is carrying out jointly with the Mother-Child Department through the "Centro de Investigación Epidemiológica en Salud Reproductiva y Familiar, Profesor "Dr. Roberto Caldyro Barcia". Presently this Center is working only in the departments of Guatemala and Huehuetenango.

Implementing similar Epidemiological Surveillance Systems would improve the statistics at the Ministry of Public Health and would help in the decision making, as these "Active Systems" allow the implementation of interventions in a timely manner. These would also control the maternal and infant mortality rates not only in the community but also at the hospital level, contemplating many socio-demographic and epidemiological factors of interest for the MotherCare Project.
3. Regarding intervention at hospitals, technical support for general physicians will be required in the area of gynecology-obstetrics surgery

proceedings, in order to strengthen what they have learned by practice. ~~Rotation of two months should be made in three levels hospitals with head physicians at national hospitals of gynec-obstetrics in Guatemala City~~ (Hospital Roosevelt, Hospital General San Juan de Dios).

4. Development of protocols for hospitals is feasible as directors agree with such protocols. However, it is required to determine the hospital resources necessary for this process.
5. Distance in kilometers from patients houses to the Capital of the Department does not seem to be a determinant variable in the child and maternal mortality. However, it may play an intermediate role among factors affecting the lack of utilization of services. This is evident in the summary tables at the end of each department evaluated.

Therefore, other variables will have to be developed to explain the reason for these high rates.

The problem might be the quality of attention provided by the birth attendant at the community level and the quality of attention provided at hospital level, additional to ethnic and cultural factors as well as school level of the population.

Another factor is the non-detection of high-risk cases in the previously mentioned levels of attention. To improve this detection, other strategies must be used to identify high and low obstetric risk cases. The establishment of "Active Epidemiological Surveillance Systems" previously mentioned would be of assistance.

6. On the other hand, measurement of morbidity is more complicated than measurement of mortality, as the present forms used by the Ministry of Public Health make it difficult to measure morbidity at the population

level.

Therefore, it will be required to make a joint revision of these forms with the staff in charge of the Data Processing Department at the Ministry of Health.

It might be easier to improve the record of morbidity at the hospital level, as it is simpler to make changes in the record forms for diagnosis in the out-patients and in-patients.

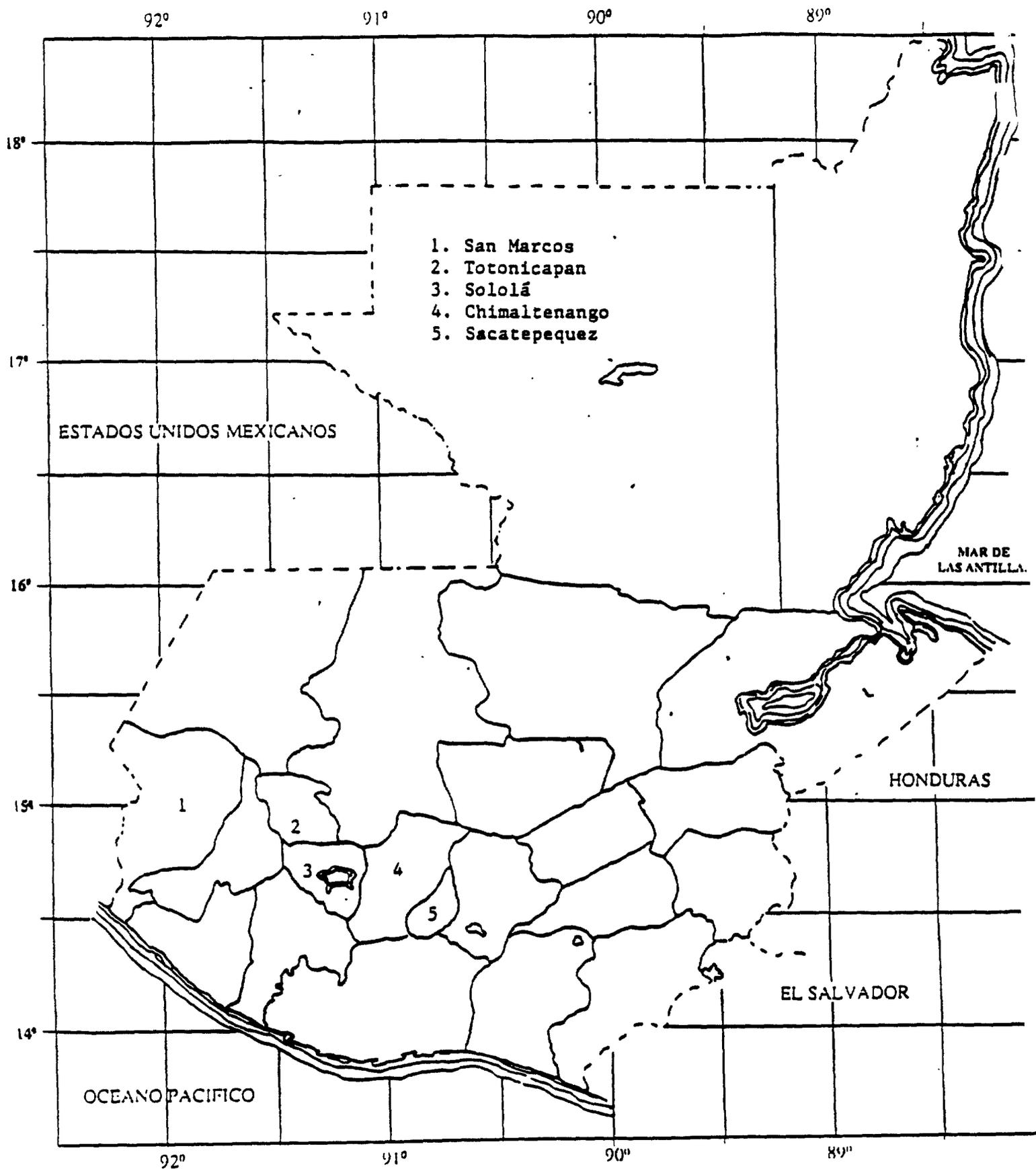
It is complicated, therefore, to try marking limits of reference origins, even harder actually, is to measure it, due to inadequate completion of forms, under-record, and lack of systematization of information.

Due to the above-mentioned factors, the information on places referring a larger amount of patients is not correct. Consequently, at the beginning we should consider the maternal and infant mortality in order to designate priority areas for intervention.

7. As there are no "type A" health centers in any of mentioned areas, location for community maternity must be proposed by the Heads of Health Areas and their working teams at the meeting which will be carried out in Antigua Guatemala. Therefore, plans for structuring and equipment of them will be made with the minimum required. Attention to population will be improved and the impact of the MotherCare Intervention will be strengthened through these actions.
8. Consider interaction between Christian Children's Fund and Hope Project to cooperate in the training of TBA's with the methodology proposed by MotherCare.
9. Previous to the intervention, consider anthropological issues such as culture and traditions in each area. Thus, the population will be

addressed in such a way that the methodology to be demonstrated to the community, will be concordant with culture and traditions and, therefore, be accepted by the population.

10. Promote breastfeeding within the model of attention proposed by MotherCare as an auxiliary factor to reduce infant mortality in the rural area.



Registro No. 222 Clasificación de Mapas Didácticos Esquemáticos puede circular
 Instituto Geográfico Nacional Ingeniero Alfredo Obiols Gómez

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III. DEPARTMENT OF SAN MARCOS

A. SOCIO-DEMOGRAPHIC DESCRIPTION

San Marcos is located in the western region of Guatemala, it is bounded in the North the Department of Huehuetenango; in the South by the Pacific Ocean and the Department of Huehuetenango; in the East with the Department of Quetzaltenango; and in the West with the Republic of Mexico. (1)

The City of San Marcos, the capital of the department, has an altitude of 2,398 meters above sea level, a latitude of 14°17'40", and a longitude of 91°47'44".

This department has an extension of 3,791 square kilometers. It has 29 municipal divisions as follows. See Map 1. (1)

- | | |
|--|--------------------------------------|
| 1. San Marcos | 16. Sipacapa (68 kms) |
| 2. Ayutla (85 kms) | 17. Tacaná (73 kms) |
| 3. Catarina (60 kms) | 18. Tajumulco (45 kms) |
| 4. Comitancillo (35 kms) | 19. Tejutla (32 kms) |
| 5. Concepción Tutuapa (53 kms) | 20. La Reforma (43 kms) |
| 6. El Quetzal (42 kms) | 21. Malacatán (54 kms) |
| 7. El Rodeo (35 kms) | 22. Nuevo Progreso (70 kms) |
| 8. El Tumbador (45 kms) | 23. Ocos (105 kms) |
| 9. Esquipulas Palo Gordo (6 kms) | 24. Pajapita (70 kms) |
| 10. Ixchiquán (58 kms) | 25. Rio Blanco (48 kms) |
| 11. San Miguel Ixtahuacán (47 kms) | 26. San Antonio Sacatepéquez (9 kms) |
| 12. San Pablo (44 kms) | 27. San Cristóbal Cucho (5 kms) |
| 13. San Pedro Sacatepéquez (1 km) | 28. San Jose Ejetenan (83 kms) |
| 14. San Rafael Pie de la Cuesta (27 kms) | 29. San Lorenzo (22 kms) |
| 15. Sibinal (78 kms) | |

* In parentheses, distance in kilometers from the municipal to the capital of the department

San Marcos has a projection of 766,950 inhabitants for 1994. From this population, 12.91% (98,985) live in the urban area and 87.09% (667,965) live in the rural area (2).

Graphic No. 1 shows the population pyramid. We can observe in this graphic that the pyramid base is wide and the largest population is concentrated on the infant area, implicating that the prevalence of contraceptives and education in family planning is very low.

Migratory movements which could affect the amount of births do not influence seriously the birth rates. The National Institute of Statistics (INE) reports it is not more than 10%, as shown in Graphic 2. (3)

Accordingly to the Ministry of Public Health, the infant mortality rate for San Marcos was 33.96 x 1,000 born alive in 1991, and a mortality for illnesses during the perinatal period of ~~35.03 x 100,000 inhabitants~~ in 1990 (3).

The maternal mortality rate estimated by the Ministry of Public Health was of ~~19.5% x 10,000 born alive~~ for 1989, with an under record ~~7.5%~~. Following are causes reported: hemorrhage 38%, toxemia 24%, sepsis 22%, complications from abortion 6%, others 10%. (4)

These maternal deaths could be prevented in a 90%, depending on the cause of death and the place of residence.

Graphic 3 shows maternal deaths by municipal and the areas with the highest incidence of deaths.

We can notice that Tacaná, Malacatán, Concepción Tutuapa, Comitancillo, San Pedro Sacatepéquez, El Tumbador, Ayutla, San Marcos, and San Pablo have highest rates of births. (See Graphic 4) (3).

Considering ranges of age with highest fecundity, we can observe that the group from 18 to 24 years of age has the highest rate or number of births born

alive. This indicates an early start in procreation, implicating that possibly no contraceptive methods are being used, as well as a lack of education in women (3) (See Graphic 5).

We did not observe any significant variation regarding the amount of births throughout the year, but it tends to decrease in the month of July where a reduction is observed. (3) (See Graphic 6).

Considering the marital status of mothers, the number of births in 1990 was higher for married women, 36.89%; for women living with a man without being married, 34.63%; and for single women, 27.87% (See Graphic 7) (3).

Births by place of delivery were as follows: 93.42% (27,777 born alive) in the house; 6.03% (1,793 born alive) in the hospital; and 0.27% (80 born alive) in a Private Hospital, implicating a poor coverage for deliveries (3) (See Graphic 8).

In a joint evaluation of the staff in charge of deliveries, we find that in a 94.38% (27,919 born alive), it was performed by a person with no previous training; in a 4.48% (1,324 born alive), by medical staff; and in a 0.93% (276 born alive), by birth attendants. This reflects the quality of attention provided to the mother-child group in this area (3). (See Graphic 9).

We could also observe that low-birth weight has a prevalence of 14.69%, which is considered very high as reported by WHO for third-world countries (3). (See Graphic 10).

B. RESOURCES AND STRUCTURE OF THE HEALTH SYSTEM IN THE DEPARTMENT OF SAN MARCOS

As previously mentioned, San marcos has 29 municipal divisions, and the health system has been divided into 15 districts.

It has two hospitals, the National Hospital of San Marcos with a capacity of 166 beds and the Hospital of Malacatán; 19 Type "B" health centers; and 80 health posts, with a total of 101 buildings. (See Map 2 for more detail).

Table 1 shows information on services provided by municipio (hospital, health center or post). It also includes human resources: 48 physicians, 45 professional nurses, and 251 auxiliary nurses.

Birth attendants are distributed by health district, and Table 2 shows that most of them can be found in the districts of San Pedro Sacatepéquez, Comitancillo, Ixchiguán, San Pablo, San Jose El Rodeo.

Districts and municipios with the lowest percentage of birth attendants are San Jose Ojetan, El Tumbador, Nuevo Progreso, Tajumulco, El Quetzal, and Sibinal.

The National Hospital of San Marcos was evaluated subsequently: it has a capacity for 200 beds, but presently only 128 are available. 25 beds are assigned to the Gyneco-Obstetrics Department: 14 for post-partum; 3 for abortions and 5 for Gynecology. There are 20 cribs and 10 incubators available for newborns. There is no specific area for neonatology.

There is a lack of internal physicians; there are no registered birth attendants at the hospital; also, obstetricians and pediatricians are very scarce. More detailed information on human resources is included in Table 3.

As can be seen in Table 4, in 1994 a total of 1,602 deliveries and cesarean sections were reported. From this, 72.79% were simple eutotic deliveries and 27.21 cesarean sections. The amount of abortions reported for the same year was 402 and the amount of pre-natal controls was very low.

It is important to mention that the hospital lacks necessary protocols for the management of obstetric patients and neonates.

There are separate sections for deliveries, cesarean sections, abortions

and gynecologic problems requiring surgery.

Regarding evaluation of essential services at the hospital, Table 5 shows that there is a lack of instruments for evacuation of the uterus, with only a ~~66.66%~~ of those required. Availability of essential drugs was only 74.14% at this level. Reason mentioned was that the budget does not cover needs throughout the year.

We interviewed Carlos Rodriguez and Yabaida Gramajo who provided paperwork used at the hospital as well as some statistic data for production of hospital services.

Dr. Luis Orozco, acting Director, was also interviewed. He indicated that the hospital would be willing to receive technical assistance in the preparation of protocols for the management of obstetric patients and neonates, as this would also benefit them.

Mrs. Alba Diaz de Perez, Chief nurse, was also interviewed. She indicated she had been working for approximately 22 years with the health sector in the Ministry, and that she has not received any training in the mother-child area. On the other hand, they would be interested in participating and supporting directly the activities with birth attendants; her staff is also interested in the development of MotherCare activities at the hospital level.

The Health Area Head has three computers for epidemiology, a statistician and an epidemiologist (however, the latter is vacant).

Dr. Manuel Gutierrez Longo, Chief of the San Marcos Area, proposed the following areas for intervention: Tacaná, Tajumulco, San Jose Ojetenam, Ixchiguán, Concepción Tutuapa and possibly Comitancillo.

We also interviewed Mrs. Ninfa Betzabe Orozco Monzon, graduate nurse and Chief nurse in this health area, who has been working with the Ministry for 20

years. She indicated that training in the mother-child area is only occasional; she would also support the MotherCare activities.

C. RECOMMENDATIONS

1. The selection of areas for intervention should be made after an analysis of indicators and some issues about hospital response. However, maternal and infant mortality rates should be considered.

Table 6 summarizes municipios showing important indicators. Following are areas I recommend in a priority sequence:

- | | |
|-----------------------|----------------------|
| 1. Tacaná | 5. Ixtahuacán |
| 2. Tajumulco | 6. San Jose Ojetenan |
| 3. San Marcos | 7. Sibinal |
| 4. Concepción Tutuapa | |

2. It must be kept in mind that the preparation of protocols at the hospital level will create new needs not only in the management of patients but also in the training of technical personnel.
3. It is important to mention that support services at the hospital level are scarce due to the limited budget. An increase in the demand of services must be anticipated when birth attendants begin referring patients to the hospitals.
4. Activities must be coordinated properly with the Health Area Chief for the success of the project.
5. Also, activities must be coordinated with the Proyecto Salud para Todos, a Sweden project, to take advantage of their resources. They would be used in a joint effort to train birth attendants in the area of San

Marcos.

6. The referral and back referral system with birth attendants should be improved. Therefore, a proper control must be maintained of services provided by birth attendants as well as references they could make in coordination with the hospital.

TABLE 1
HUMAN RESOURCES BY DISTRICT
DEPARTMENT OF SAN MARCOS

DISTRICT	PHYSICIANS	PROFESSIONAL NURSES	AUXILIARY NURSES
1. San Marcos	2	1	14
2. San Pedro	2	2	14
3. Tejutla	1	1	12
4. Tacaná	1	1	9
5. Comitancillo	1	1	4
6. San Rafael Pie de La Cuesta	1	1	6
7. San Pablo	1	1	8
8. Malacatán	1	1	11
9. Tumbador	1	1	9
10. Tecún Uman	1	1	12
11. La Reforma	1	1	4
12. San Lorenzo	1	1	5
13. Concepción Tutuapa	1	1	6
14. San Jose Ojotenan	1	1	5
15. Sibal	1	1	5
16. San Miguel Ixtahuacán	1	1	3
17. Tajumulco	1	1	6
18. Sipacapa	1	1	4
19. El Quetzal	1	1	5
1. Hospital Nacional de San Marcos	19	17	76
2. Hospital Nacional de Malacantan	8	8	33
Total	48	45	251

TABLE 2

**ACTIVE BIRTH ATTENDANTS BY MUNICIPAL
DEPARTMENT OF SAN MARCOS**

MUNICIPAL	AMOUNT	PERCENTAGE
1. San Marcos	55	6.55
2. San Cristóbal Cucho		
3. San Pedro Sacatepéquez	121	14.40
4. San Antonio Sacatepéquez		
5. Tejutla	47	5.60
6. Tacaná	57	6.79
7. Ixchiquán		
8. Comitancillo	70	8.33
9. San Rafael Pie de la Cuesta	52	6.19
10. Esquipulas Palo Gordo		
11. San Pablo	60	7.14
12. San José El Rodeo		
13. Malacatán	67	7.97
14. Catarina		
15. El Tumbador	11	1.31
16. Nuevo Progreso		
17. Tecún Uman	51	6.07
18. Ocos		
19. Pajapita		
20. La Reforma	22	2.62
21. San Lorenzo	46	5.48
22. Rio Blanco		
23. Concepción Tutuapa	22	2.62
24. San José Ojetenán	9	1.07
25. Sibinal	22	2.62
26. San Miguel Ixtahuacán	55	6.55
27. Tajumulco	28	3.33
28. Sipacapa	31	3.69
29. Quetzal	14	1.67
Total	840	100.00

TABLE 3

AVAILABLE HUMAN RESOURCES
NATIONAL HOSPITAL OF SAN MARCOS

PERSONNEL	AMOUNT	PERCENTAGE
1. Gyneco-obstetricians	1	0.88
2. Pediatricians	3	2.66
3. Surgeons	3	2.66
4. Internal physicians	0	0.00
5. Anesthesiologists	1	0.88
6. General physicians	12	10.62
7. Chief nurses	17	15.04
8. Auxiliary nurses	76	67.26
9. Registered birth attendants	0	0.00
TOTAL	113	100.00

TABLE 4

PRODUCTION OF SERVICES
NATIONAL HOSPITAL OF SAN MARCOS
1994 (1)

TYPE OF PATIENT	AMOUNT	PERCENTAGE
1. Deliveries	1,228	72.79
2. Cesarean sections	459	27.21
TOTAL	1687	100.00
3. Periosteotomies	402	
4. Prenatal controls	480	

TABLE 5

EVALUATION OF ESSENTIAL ELEMENTS FOR OBSTETRIC ATTENTION
AT THE PRIMARY LEVEL OF REFERENCE
NATIONAL HOSPITAL OF SAN MARCOS
1994 (1)

PARAMETER EVALUATED	PERCENTAGE
Instruments for Laparotomy	100
Clothes and other	85.71
Instruments for deliveries	76.47
Instruments for evacuation of the uterus	66.66
Instruments for neonatal resuscitation	100
Equipment for anesthesia	91.67
Resources for laboratory	91.67
Blood bank	100
Essential drugs	74.14

TABLE 6

FINAL CONSOLIDATION FOR DECISION MAKING ON THE SELECTION OF MUNICIPALS
FOR A POSSIBLE INTERVENTION BY MOTHERCARE

MUNICIPAL	MATERNAL MORTALITY RATE 1989 x 100,000 BORN ALIVE ¹	INFANT MORTALITY RATE 1993 x 1,000 BORN ALIVE ²	BIRTHS 1993 ²	DISTANCE Kms. ³	AMOUNT OF HEALTH POSTS ⁴	AMOUNT OF BIRTH ATTENDANTS ²
1. Sibinal	647.95	29.57	541	78	2	22
2. Tejutla	632.24	33.53	1,014	32	6	47
3. San Marcos	576.13	42.86	1,423	---	6	28
4. Esquipulas Palo Gordo	431.04	32.38	247	6	1	25
5. Sn Ant. Sacatepéquez	426.44	54.96	473	9	4	61
6. Concepción Tutuapa	310.40	18.91	1,745	53	2	22
7. San Pablo	303.95	24.91	1,164	44	2	30
8. Pajapita	215.52	31.16	385	70	1	20
9. Ixtahuacán	207.25	58.22	1,271	47	2	55
10. Sn. Raf. Pie La Cuesta	183.49	30.23	463	27	2	27
11. La Reforma	176.68	27.41	693	43	1	22
12. Comitansillo	173.01	71.11	2,039	35	2	70
13. San Pedro Sacatepéquez	165.38	40.88	1,712	1	7	60
14. San José Ojetenan	152.67	27.74	757	83	1	9
15. Tajumulco	149.70	23.98	1,626	45	5	28
16. Ixchiguán	141.64	23.14	821	58	4	29
17. Malacatán	131.67	25.82	2,749	54	2	34

1 Estudio de Mortalidad Materna en Guatemala 1,989. MSPAS/DGSS/Materno Infantil, OPS/OMS/Mother-Care.

2 Jefatura de Area Departamento de San Marcos, Estadísticas 1993.

3 Instituto Geográfico de Guatemala.

4 Red de Establecimientos del Ministerio de Salud Publica y Asistencia Social, Unidad de Informatica 1994.

TABLE 6

FINAL CONSOLIDATION FOR DECISION MAKING ON THE SELECTION OF MUNICIPALS
FOR A POSSIBLE INTERVENTION BY MOTHERCARE

MUNICIPALS	MATERNAL MORTALITY RATE 1989 x 100,000 BORN ALIVE	INFANT MORTALITY RATE 1993 x 1,000 BORN ALIVE	BIRTHS 1993	DISTANCE Kms	AMOUNT OF HEALTH POST	AMOUNT OF BIRTH ATTENDANTS
18. Ayutla	118.90	23.48	596	85	5	33
19. Tacaná	111.82	4.18	2,864	73	4	28
20. El Tumbador	65.83	35.68	1,429	45	2	6
21. El Quetzal	58.54	48.48	660	42	1	14
22. Ocos	0	36.38	852	105	4	15
23. San Fco. El Rodeo	0	32.81	518	35	4	31
24. Nuevo Progreso	0	33.29	781	70	3	5
25. San Lorenzo	0	82.64	363	22	1	26
26. Rio Blanco	0	42.78	187	48	1	20
27. Sipacapa	0	40.40	495	68	1	31
28. San Cristóbal Cucho	0	35.59	618	5	3	27
29. Tecún Uman	0	40.09	848	60	2	15
TOTAL	195.27	33.68	29,334		80	840

**DEPARTMENT OF SAN MARCOS
SERVICES BY MUNICIPALS**

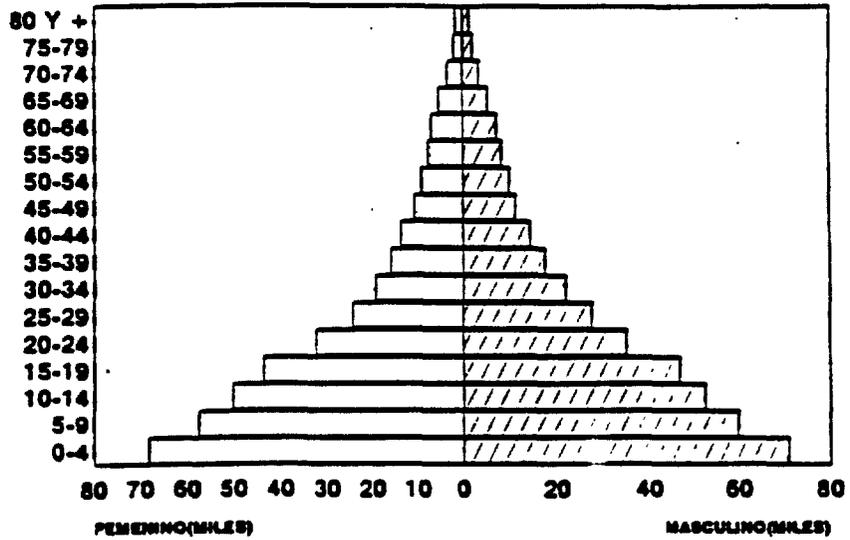
MUNICIPALS	HOSPITALS	HEALTH CENTER	HEALTH POST
1. San Marcos	1. San Marcos	1. San Marcos	1. Serchil 2. San Sebastian 3. Barranca de Galvez 4. Canton La Montaña 5. Bojónal 6. San José Las Islas
2. San Pedro Sacatepéquez		1. San Pedro Sacatepéquez	1. Provincia Chiquita 2. Corral Grande 3. Sacuchun Dolores 4. San Pedro Petz 5. El Cedro 6. Santa Teresa 7. El Chim
3. San Antonio Sacatepéquez			1. San Antonio Sacatepéquez 2. Santo Domingo
4. Comitancillo		1. Comitancillo	1. Tuimuj 2. Tuilelen 3. Ant. Tutuapa 4. Sochel
5. San Miguel Ixtahuacán			1. San Miguel Ixtahuacán 2. El Triunfo 3. Bella Vista Sicabe
6. Concepción Tutuapa		1. Concepción Tutuapa	1. Tuismo 2. Tuichuna
7. Tacaná		1. Tacaná	1. Toaca 2. Chequin Grande (Canton La Nube) 3. Chactela 4. La Esperanza 5. Tuicoche
8. Sibinal		1. Sibinal	1. Chocab 2. Checamba
9. Tajumulco		1. Tajumulco	1. Pueblo Nuevo 2. Chanchicupe 3. Bullaj 4. Toninchun 5. Nueva Florida
10. Tejutla		1. Tejutla	1. Los Cerezos 2. Nueva Fraternidad 3. Ixmúlca 4. Cuya 5. Quipambe 6. La Independencia
11. San Rafael Pie de la Cuesta		1. San Rafael Pie de la Cuesta	1. Chayen 2. Palo Gordo

MUNICIPAL	HOSPITALS	HEALTH CENTER	HEALTH POST
12. Nuevo Progreso			1. Nuevo Progreso 2. San José Ixtal 3. Buena Vista
13. El Tumbador		1. El Tumbador	1. San Jerónimo 2. La Democracia
14. El Rodeo			1. San José El Rodeo 2. San Francisco El Rodeo
15. Malacatán	1. Malacatán	1. Malacatán	1. El Carmen Frontera 2. La Unión
16. Catarina			1. Catarina 2. El Sitio 3. San Gregorio 4. Sisiltepeque
17. Tecún Uman		1. Tecún Uman	1. La Montaña 2. Sanjon San Lorenzo
18. Ocos			1. Ocos 2. Chiquirines 3. La Blanca 4. Cerritos
19. San Pablo		1. San Pablo	1. El Porvenir 2. C. Agraria
20. El Quetzal		1. El Quetzal	1. Ranchón Bojón
21. La Reforma		1. La Reforma	1. Santa Clara
22. Pajapita			1. Pajapita
23. Ixchiguán			1. Ixchiguán 2. Calapte 3. San Antonio 4. Buena Vista Choapequez
24. San José Ojetenam		1. San Jose Ojetenam	1. Pavolaj 2. Choanla 3. San Fernando
25. San Cristóbal Cucho			1. San Cristóbal Cucho 2. Barranca Grande 3. Las Majadas
26. Sipacapa		1. Sipacapa	1. Ecupijá
27. Esquipulas Palo Gordo			1. Esquipulas Palo Gordo
28. Río Blanco			1. Río Blanco
29. San Lorenzo		1. San Lorenzo	1. Santa Rosa

GRAPHIC 1

POPULATION PYRAMID OF DEPARTMENT OF SAN MARCOS By age and sex groups Projections 1994

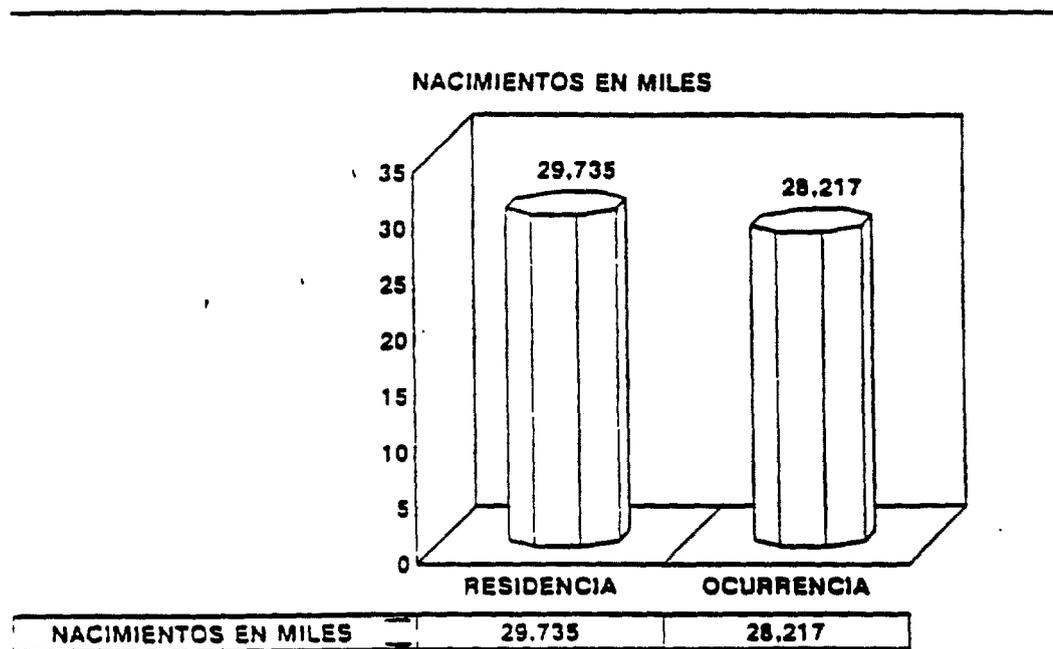
GRUPOS DE EDAD



PROYECCIONES 1980-2000 SEGEPLAN

GRAPHIC 2

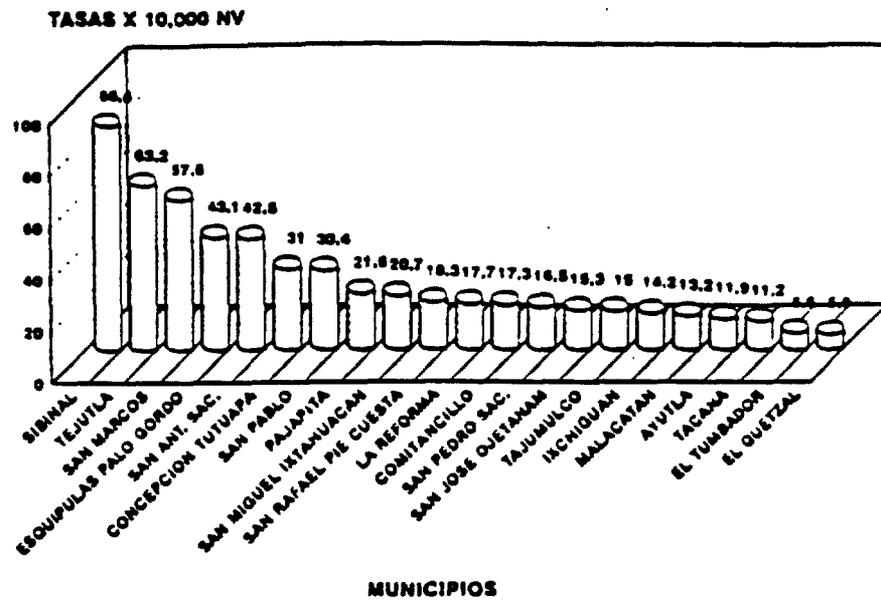
**BIRTHS BY WHERE THE DELIVERIES TOOK PLACE AND MOTHER'S DOMICILE
DEPARTMENT OF SAN MARCOS 1990**



Estadísticas Vitales INE, 1990

GRAPHIC 3

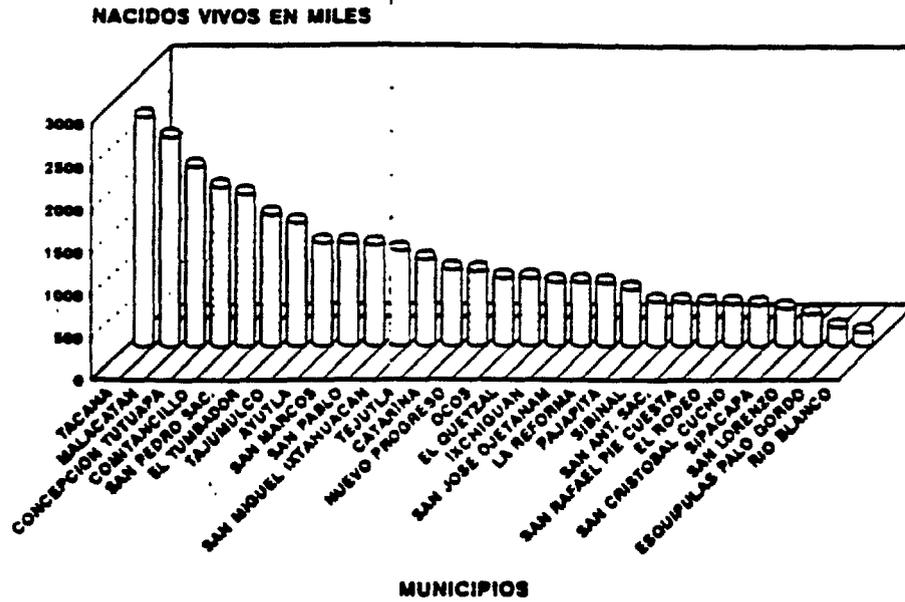
NUMBER OF MOTHER DEATHS IN 1989, BY MUNICIPAL DEPARTMENT OF SAN MARCOS



MSPAS 1989

GRAPHIC 4

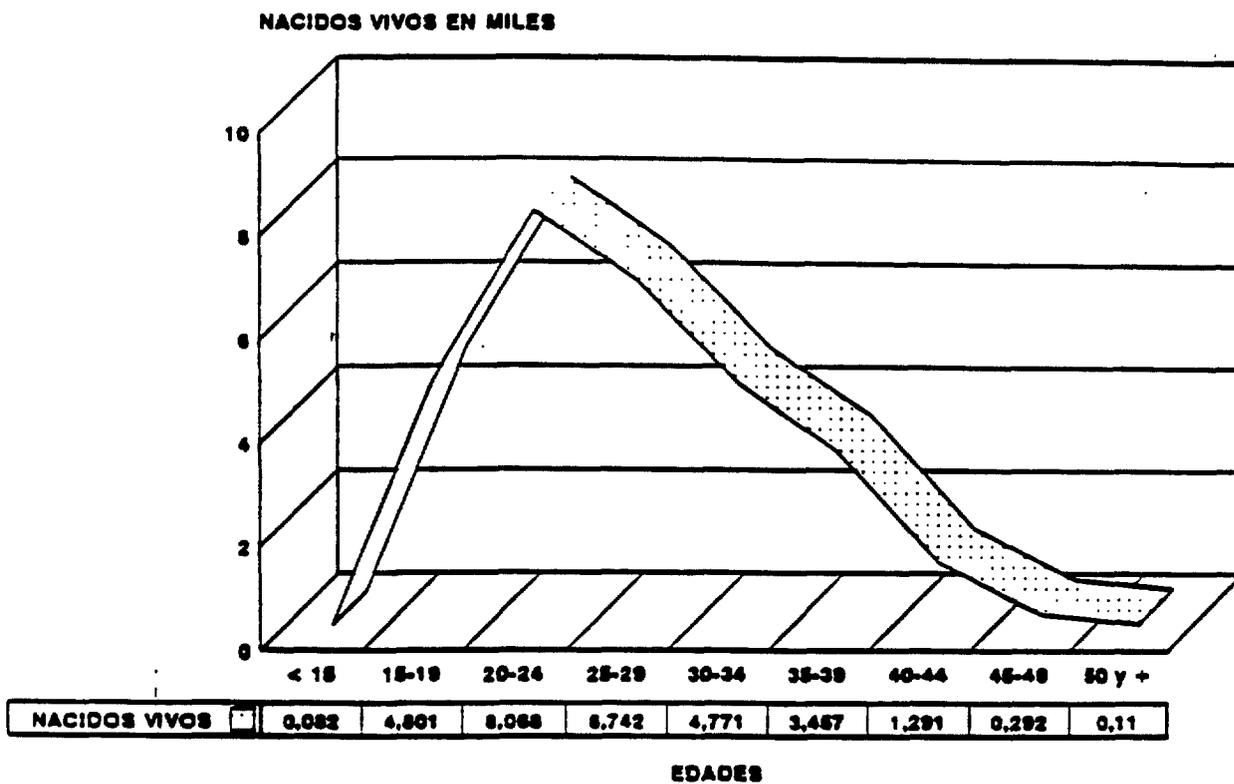
**NUMBER OF BIRTHS IN 1990,
BY MOTHER'S MUNICIPAL OF RESIDENCE
DEPARTMENT OF SAN MARCOS**



ESTADISTICAS VITALES INE. 1989-1990

GRAPHIC 5

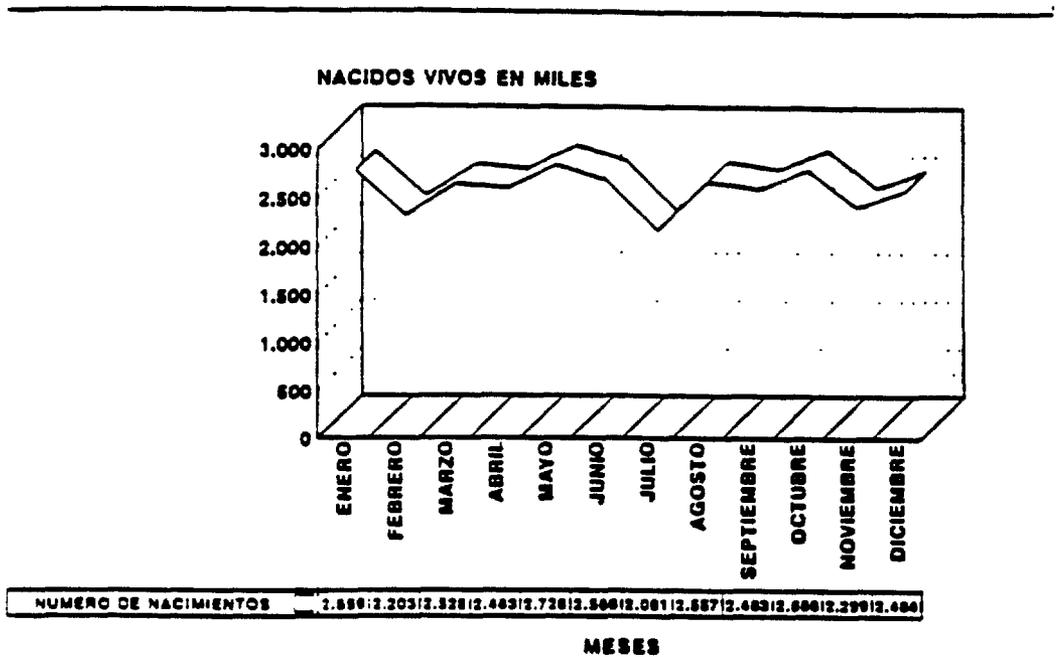
**NUMBER OF BIRTHS IN 1990, BY MOTHER'S AGE
DEPARTMENT OF SAN MARCOS**



ESTADISTICAS VITALES INE, 1988-1990

GRAPHIC 6

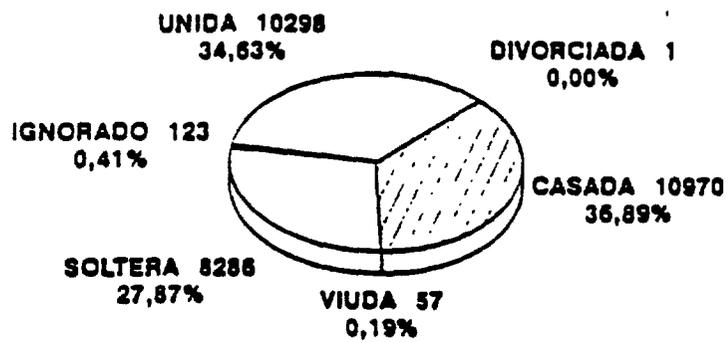
**BORN ALIVE IN 1990
DEPARTMENT OF SAN MARCOS
VARIATION THROUGH MONTHS OF THE YEAR**



ESTADISTICAS VITALES INE. 1986-1990

GRAPHIC 7

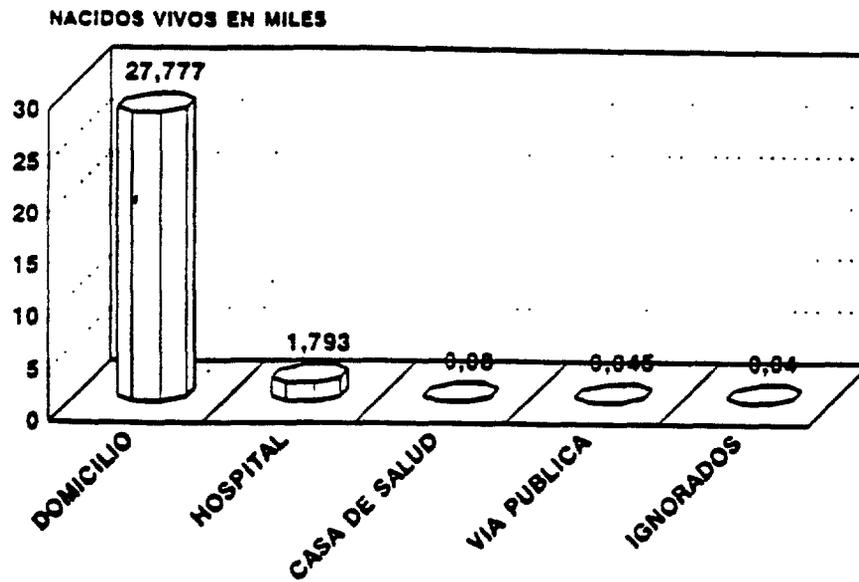
**NUMBER OF BIRTHS IN 1990, BY MOTHER CIVIL STATUS
DEPARTMENT OF SAN MARCOS**



ESTADÍSTICAS VITALES INE, 1986-1990

GRAPHIC 8

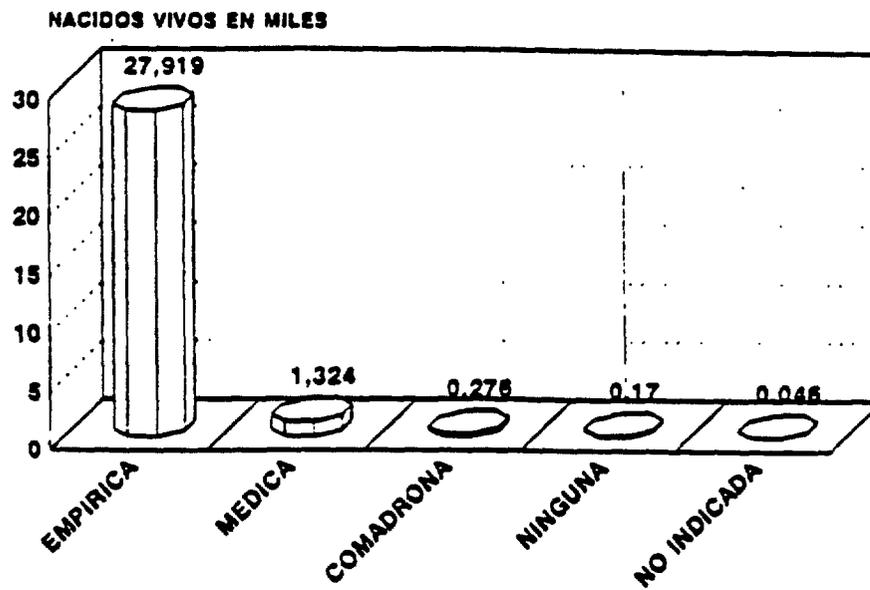
**NUMBER OF BIRTHS IN 1990,
BY WHERE THE DELIVERIES TOOK PLACE
DEPARTMENT OF SAN MARCOS**



ESTADISTICAS VITALES INE, 1988-1998

GRAPHIC 9

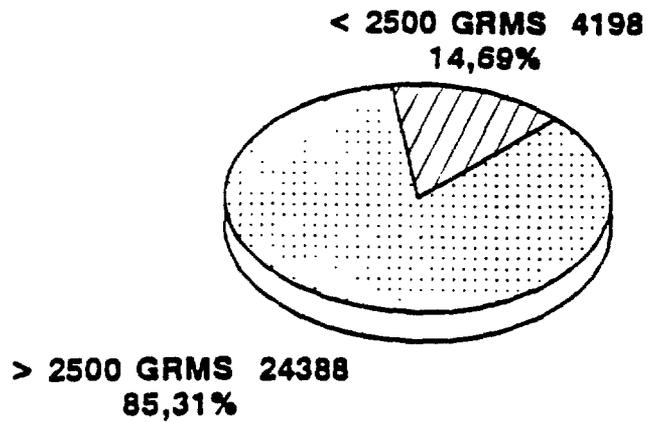
**NUMBER OF BIRTHS IN 1990, BY MOTHER'S RESIDENCE
DEPARTMENT OF SAN MARCOS**



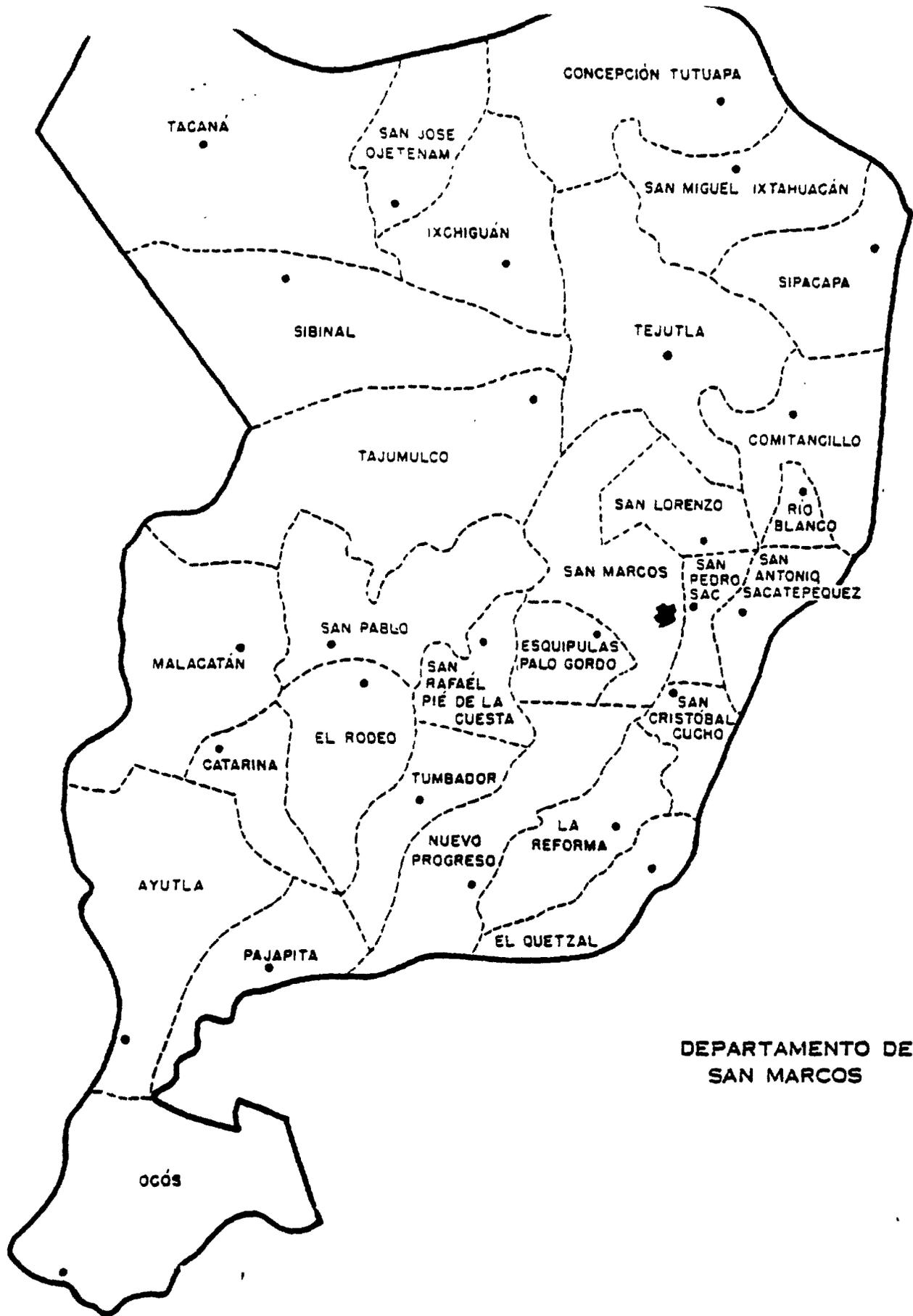
ESTADISTICAS VITALES INE. 1986-1990

GRAPHIC 10

**NUMBER OF BIRTHS IN 1990, BY BORN WEIGHT
AND MOTHER'S RESIDENCE
DEPARTMENT OF SAN MARCOS**



ESTADISTICAS VITALES INE, 1986-1990



**DEPARTAMENTO DE
SAN MARCOS**

133-0036



MUNICIPIOS

1. San Marcos
2. San Pedro Sacatepéquez
3. San Antonio Sacatepéquez
4. Comitancillo
5. San Miguel Ixtahuacán
6. Concepción Tutuapa
7. Tacaná
8. Sibinal
9. Tajumulco
10. Tejucla
11. San Rafael Pie de la Cuesta
12. Nuevo Progreso
13. El Tumbador
14. El Rodeo
15. Malacatán
16. Catarina
17. Ayutla
18. Ocos
19. San Pablo
20. El Quetzal
21. La Reforma
22. Pajapita
23. Ixchiquán
24. San José Ojetenán
25. San Cristóbal Cucho
26. Sipacapa
27. Esquipulas Palo Gorco
28. Rfo Blanco
29. San Lorenzo

HOSPITALES □

1. San Marcos
2. Malacatán

CENTROS DE SAL. ▲

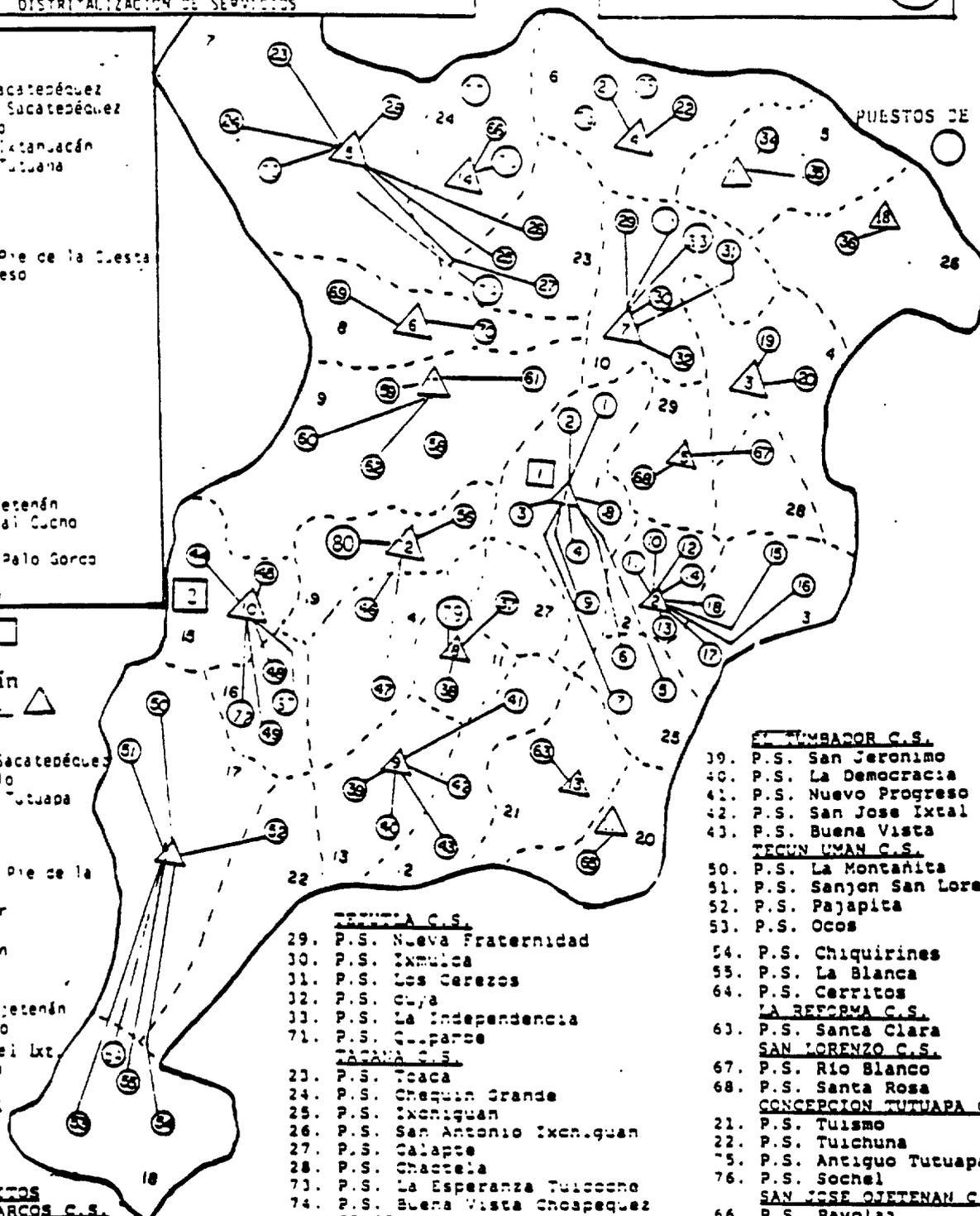
1. San Marcos
2. San Pedro Sacatepéquez
3. Comitancillo
4. Concepción Tutuapa
5. Tacaná
6. Sibinal
7. Tejucla
8. San Rafael Pie de la Cuesta
9. El Tumbador
10. Malacatán
11. Tecún Uirán
12. San Pablo
13. La Reforma
14. San José Ojetenán
15. San Lorenzo
16. San Miguel Ixt.
17. Tajumulco
18. Sipacapa
19. El Quetzal

DISTRITOS

- SAN MARCOS C.S.**
1. P.S. Serchil
 2. P.S. Barranca de Gálvez
 3. P.S. San Sebastian
 4. P.S. Canton La Montaña
 5. P.S. San Cristobal Cucho
 6. P.S. Barranca Grande
 7. P.S. Las Majadas
 8. P.S. El Mojonal
 9. P.S. San Jose Las Islas
- SAN PEDRO SAC. C.S.**
10. P.S. Provincia Chiquita
 11. P.S. Corral Grande
 12. P.S. Sacuchun Dolores
 13. P.S. San Pedro Petz
 14. P.S. El Cedro
 15. P.S. San Antonio Sac.
 16. P.S. Sto. Domingo Sac.
 17. P.S. Santa Teresa
 18. P.S. El Chim

- TEJUCA C.S.**
29. P.S. Nueva Fraternidad
 30. P.S. Ixmiquica
 31. P.S. Los Cerezos
 32. P.S. Cuya
 33. P.S. La Independencia
 34. P.S. Guaparde
- TACANÁ C.S.**
23. P.S. Teaca
 24. P.S. Chequin Grande
 25. P.S. Ixchiquan
 26. P.S. San Antonio Ixchiquan
 27. P.S. Galapote
 28. P.S. Chactela
 29. P.S. La Esperanza Tutuccho
 30. P.S. Buena Vista Choapequez
- SAN RAFAEL PIE DE LA CUESTA C.S.**
17. P.S. Esquipulas
 19. P.S. Palo Gorco
 20. P.S. Crayen
- SAN PABLO C.S.**
56. P.S. Chagraria
 57. El Portenir
 58. San Jose El Rodeo
 59. San Francisco El Rodeo
- MALACATÁN C.S.**
44. P.S. El Carrer Frontera
 45. P.S. La Union
 46. P.S. Catarina
 47. P.S. El S.ocio
 48. P.S. S. S. tepeque
 49. P.S. S. S. tepeque
 50. P.S. S. S. tepeque

- EL TUMBADOR C.S.**
39. P.S. San Jeronimo
 40. P.S. La Democracia
 41. P.S. Nuevo Progreso
 42. P.S. San Jose Ixtal
 43. P.S. Buena Vista
- TECUN UIRAN C.S.**
50. P.S. La Montañita
 51. P.S. Sanjon San Lorenzo
 52. P.S. Pajapita
 53. P.S. Ocos
- LA REFORMA C.S.**
63. P.S. Santa Clara
 64. P.S. Rio Blanco
 65. P.S. Santa Rosa
- CONCEPCION TUTUAPA C.S.**
21. P.S. Tuismo
 22. P.S. Tuichuna
 23. P.S. Antiguo Tutuapa
 24. P.S. Sochel
- SAN JOSE OJETENAN C.S.**
46. P.S. Pavolaj
 47. P.S. Cheanla
 48. P.S. San Fernando
- SIBINAL C.S.**
59. P.S. Chocob
 60. P.S. Checamba
- SAN MIGUEL IXTAHUACAN C.S.**
35. P.S. El Triunfo
 36. P.S. Sicabe Bella Vista
- TAJUMULCO C.S.**
58. P.S. Pueblo Nuevo
 59. P.S. Chanchicupe
 60. P.S. Toninchun
 61. P.S. Bullaj (Tutana)
 62. P.S. San Jose La Paz
- SIPACAPA C.S.**
36. P.S. Escupija
- EL QUETZAL C.S.**
35. Rancho Bojon



IV. DEPARTMENT OF TOTONICAPAN

A. SOCIO-DEMOGRAPHIC DESCRIPTION

Totonicapán is located in the western region of Guatemala, limiting to the North with the Department of Huehuetenango; to the South with the department of Sololá; to the East with the Department of Quiché; and to the West with the department of Quetzaltenango. (1)

The City of Totonicapán, cabecera departamental, has an altitude of 2,495 meters above sea level, a latitude of 14°54'39", and a longitude of 91°31'28".

This department has an extension of 1,061 square kilometers. It has 8 municipal divisions (municipios) as follows. See Map 1. (1)

1. Totonicapán
2. Momostenango (33 kms)
3. San Andres Xecul (18 kms)
4. San Bartolo (51 kms)
5. San Cristóbal Totonicapán (14 kms)
6. San Francisco El Alto (18 kms)
7. Santa Lucía La Reforma (62 kms)
8. Santa María Chiquimula (49 kms)

In parentheses, distance in kilometers to the cabecera departamental.

Distance from the City of Totonicapán, cabecera departamental, to the City of Guatemala is 203 kms, by paved road.

Totonicapán has a projection of 324,225 inhabitants for 1994. From this population, 15.13% live in the urban area and 84.87 live in the rural area (2).

Its population pyramid, as in previously mentioned departments, has a wide base and the largest population is concentrated on the infant area. (See Graphic 1).

Migratory movements do not influence seriously the birth rates. Making a comparison of births by place of occurrence and the mother's residence, no major changes are noticed for 1990, as shown in Graphic 2. (3)

According to the Ministry of Public Health, the infant mortality rate was 67.09 x 1,000 born alive, and a mortality for illnesses during the perinatal period of 93.40 x 100,000 inhabitants in 1990. This department has the highest perinatal mortality rate in the country (3).

The maternal mortality rate estimated by the Ministry of Public Health was of 28.9% x 10,000 born alive for 1989, with an under record of 72%. Following are causes reported: hemorrhage 66%, toxemia 7%, sepsis 10%, complications from abortion 7%, others 10%. (4)

Graphic 3 shows maternal deaths by municipio, and the areas with the highest incidence of deaths are: San Andres Xecul, Santa Lucía La Reforma, Totonicapán, Santa María Chiquimula, and San Cristóbal Totonicapán.

A higher percentage of births occurred in Totonicapán, Momostenango, San Francisco El Alto, Santa María Chiquimula, and San Cristóbal Totonicapán. See Graphic 4. (3)

Fecundity rates were higher in the group from 15 to 24 years of age, as described in previous departments. (See Graphic 5). (3)

Variations on the amount of births were recorded during the month of August, 1990. However, in general they were constant throughout the year. (See Graphic 6.)

Births by place of delivery were as follows: 97.11% in the

house; 2.52% in the hospital.

Regarding the staff in charge of deliveries, we find that in a 96.41%, it was performed by a person with no previous training; and only in a 2.94% by medical staff. (See Graphics 7 and 8.) (3)

The marital status of mothers was as follows: married women, 63.11%; single women 31.43%; and women living with a man without being married, 5.16%. (See Graphic 9.) (3).

We could also observe that low-birth weight has a prevalence of 11.72%, which is considered high. (See Graphic 10.) (3)

B. RESOURCES AND STRUCTURE OF THE HEALTH SYSTEM IN THE DEPARTMENT OF TOTONICAPAN

As previously mentioned, Totonicapán has 8 municipal divisions, and the health system has been divided into 9 districts.

It has one hospital, the National Hospital Dr. Jose Felipe Flores. There are no Type "A" health centers, but there are 9 Type "B" health centers, and 22 health posts (See Map 2 for more detail).

Table 1 shows human resources in the Totonicapán area: 16 physicians, 21 professional nurses, and 128 auxiliary nurses.

Birth attendants are concentrated in the city of Totonicapán, 26.55% (171), followed by Momostenango with 26.55% (145), as shown in Table 2.

It is important to mention that there are 20 trained traditional birth attendants, financed by the Hope Project, in the districts of Momostenango, Santa María Chiquimula, San Lucía La Reforma and

Totonicapán. They are supporting and supervising 250 birth attendants in the previously-mentioned districts.

The National Hospital of Totonicapán has a capacity for 107 beds; 18 beds are assigned to the Gyneco-Obstetrics Department.

The Pediatrics Department has 18 cribs, 8 beds and incubators for premature babies. However no qualified personnel is available for this department nor for the Gynecology department. As can be seen in Table 3, no specialists are available in this area.

There is a shortage of anesthesiologists. Four technicians cover this service and some times surgeons have to perform anesthetics.

In 1994, a total of 1,228 deliveries were performed. From this, 82.90% were simple eutocic deliveries and 17.10 cesarean sections. Totonicapán has the smallest percentage of surgical deliveries.

490 Periosteotomies and 288 prenatal controls were performed in 1994. (See Table 4)

Regarding availability of essential elements for obstetric attention, it was noticed that essential drugs are very scarce with only a 44.48% of those recommended by WHO. There was also a lack of equipment for evacuation of the uterus, with an availability of only a 66.67%, as shown in Table 5.

Reason mentioned was that the quarterly budget is limited. Therefore, attention for obstetric patients and neonates is very deficient.

We interviewed Dr. Fredy Gonzalez, acting director, as Dr. German Schell, Director, was on vacation. He indicated that there are no protocols for the management of obstetric patients and neonates and

that they would be willing to receive technical support.

We also talked with Mr. Edgar Menchu who provided statistical data on the hospital. He was a great help in the field work.

The Chief nurse was on vacation. However, we talked with Mrs. María Antonieta Ayala, graduate nurse, who has been working for 13 years with the Ministry of Public Health. She indicated she would be willing to work with the MotherCare Project as it would be positive for the hospital. She also said that she has not received any training from the Ministry in the mother-child area.

We also interviewed Dr. Jaime Rolando Rios Herrera, who showed concern regarding the high infant mortality rates and the lack of financial resources to train birth attendants.

C. RECOMMENDATIONS

1. As can be noticed in the statistical data shown in Table 6, this department requires of a systematic intervention in all areas. The high rates of infant and maternal mortality are alarming.
 2. The possibility to work jointly with Hope should be considered. This project is also working with birth attendants and their human resources could be coordinated with those of MotherCare.
 3. The preparation of management protocols is feasible, as the hospital does not have any at the present time.
 4. It would be very important to strengthen the hospital capacity with trained personnel in the mother-child area (pediatricians, obstetricians). Presently they lack this resource.
- Also, a trained anesthesiologist should be stationed at the

hospital (or available on call) to cover high-risk cases.

TABLE 1

HUMAN RESOURCES
AREA OF TOTONICAPAN

HUMAN RESOURCES	AMOUNT	PERCENTAGE
1. Physicians	16	9.70
2. Professional nurses	21	12.72
3. Auxiliary nurses	128	77.58
TOTAL	165	100.00

TABLE 2

ACTIVE BIRTH ATTENDANTS BY MUNICIPAL
DEPARTMENT OF TOTONICAPAN

MUNICIPAL	AMOUNT	PERCENTAGE
1. Momostenango	171	26.56
2. San Andres Xecul	73	11.34
3. San Fco. El Alto	52	8.07
4. San Bartolo	22	3.42
5. Sta. Lucía	36	5.59
6. Sta. María	45	6.99
7. Totonicapán	182	28.25
8. San Cristóbal	63	9.78
TOTAL	644	100.00

TABLE 3

AVAILABLE HUMAN RESOURCES
NATIONAL HOSPITAL OF TOTONICAPAN

PERSONNEL	AMOUNT	PERCENTAGE
1. Gyneco-obstetricians	0	0.0
2. Pediatricians	0	0.0
3. Surgeons	1	1.15
4. Internal physicians	0	0.0
5. Anesthesiologists	0	0.0
6. General physicians	10	11.49
7. Chief nurses	13	14.94
8. Auxiliary nurses	63	72.41
9. Registered nurses	0	0.0
TOTAL	87	100.00

TABLE 4

PRODUCTION OF SERVICES
NATIONAL HOSPITAL OF TOTONICAPAN
1994

TYPE OF PATIENT	AMOUNT	PERCENTAGE
1. Deliveries	1,018	82.90
2. Cesarean sections	210	17.10
TOTAL	1,228	100.00
3. Periosteotomies	490	
4. Prenatal controls	288	

44

TABLE 5

EVALUATION OF ESSENTIAL ELEMENTS FOR OBSTETRIC ATTENTION
 AT THE PRIMARY LEVEL OF REFERENCE
 NATIONAL HOSPITAL OF TOTONICAPAN
 1994

PARAMETER EVALUATED	PERCENTAGE
Instruments for Laparotomy	100
Clothes and other	85.71
Instruments for deliveries	88.24
Instruments for evacuation of the uterus	66.67
Instruments for neonatal resuscitation	83.33
Equipment for anesthesia	83.33
Resources for laboratory	100
Blood bank	83.33
Essential drugs	

45

TABLE 6

FINAL CONSOLIDATION FOR DECISION MAKING ON THE SELECTION OF MUNICIPALS
FOR A POSSIBLE INTERVENTION BY MOTHERCARE

MUNICIPAL	MATERNAL MORTALITY RATE 1989 X 100,000 BORN ALIVE ¹	INFANT MORTALITY RATE 1993 X 1,000 BORN ALIVE ²	BIRTHS 1993 ²	DISTANCE Kms ³	AMOUNT OF HEALTH POSTS ⁴	AMOUNT OF BIRTH ATTENDANTS ²
1. San Andres Xecul	564.97	66.19	831	18	1	73
2. Santa Lucia La Reforma	523.56	27.52	545	62	2	36
3. Totonicapán	347.22	55.52	3,422	---	4	182
4. Santa Maria Chiquimula	323.83	82.99	1,285	49	3	45
5. Sn Crist. Totonicapán	285.99	64.57	1,146	14	3	63
6. San Bartolo Aguas Cal.	257.73	54.05	407	51	1	22
7. Momostenango	206.61	58.79	3,079	33	5	171
8. San Fco. El Alto	137.08	80.03	1,562	18	1	52
TOTAL	288.56	61.74	12,277		22	644

1 Estudio de Mortalidad Materna en Guatemala 1,989. MSPAS/DGSS/Materno Infantil, OPS/OMS/Mother-Care.

2 Jefatura de Area Departamento de Totonicapán, Estadísticas 1993.

3 Instituto Geográfico de Guatemala.

4 Red de Establecimientos del Ministerio de Salud Publica y Asistencia Social, Unidad de Informatica 1994.

DEPARTMENT OF TOTONICAPAN
SERVICES BY MUNICIPAL

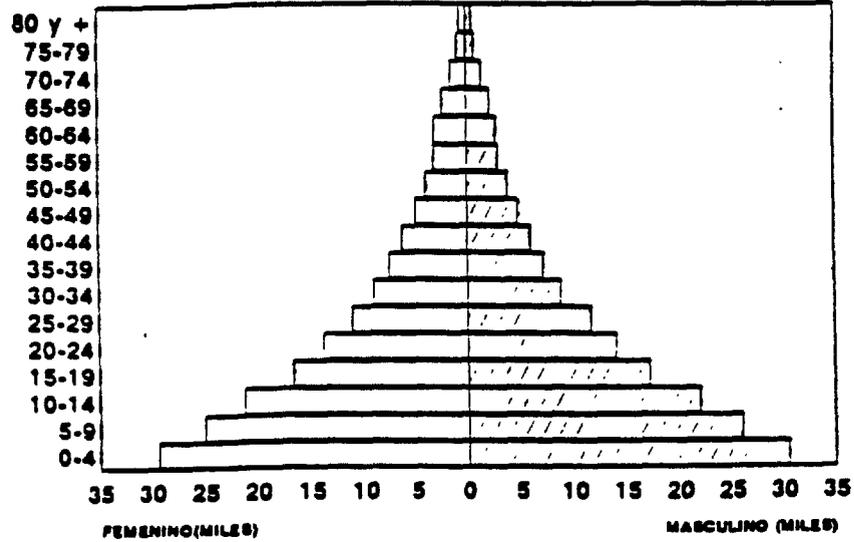
MUNICIPAL	HOSPITALS	HEALTH CENTER	HEALTH POST
1. Totonicapán	Hosp. Nac. Totonicapán	Totonicapán	1. Barreneché 2. Mactzul 3. Chipuac 4. Panquix
2. San Cristóbal Totonicapán		San Cristóbal Totonicapán	1. San Ramón 2. Patachaj 3. Nueva Candelaria
3. San Francisco El Alto		San Francisco El Alto	1. Chivarreto 2. Rancho Teja 3. San Antonio Sija
4. San Adrés Xecul		San Adres Xécul	1. Palomora
5. Momostenango		Momostenango San Vicente Buenabaj	1. Pueblo Viejo Tunayac 2. Pologuá 3. Xequemeyá 4. Tzampoj 5. Chinimabe
6. Santa María Chiquimula		Santa María Chiquimula	1. Chuicacá 2. Xecachenalaj 3. El Rancho
7. Santa Lucía La Reforma		Santa Lucía La Reforma	1. Pamaría 2. Sacasiquan
8. San Bartolo		San Bartolo	1. Tierra Blanca

GRAPHIC 1

POPULATION PYRAMID OF DEPARTMENT OF TOTONICAPAN By age and sex groups Projections 1994

PIRAMIDE POBLACIONAL DEL DEPARTAMENTO DE TOTONICAPAN POR GRUPOS ETAREOS Y SEXO PROYECCIONES 1994

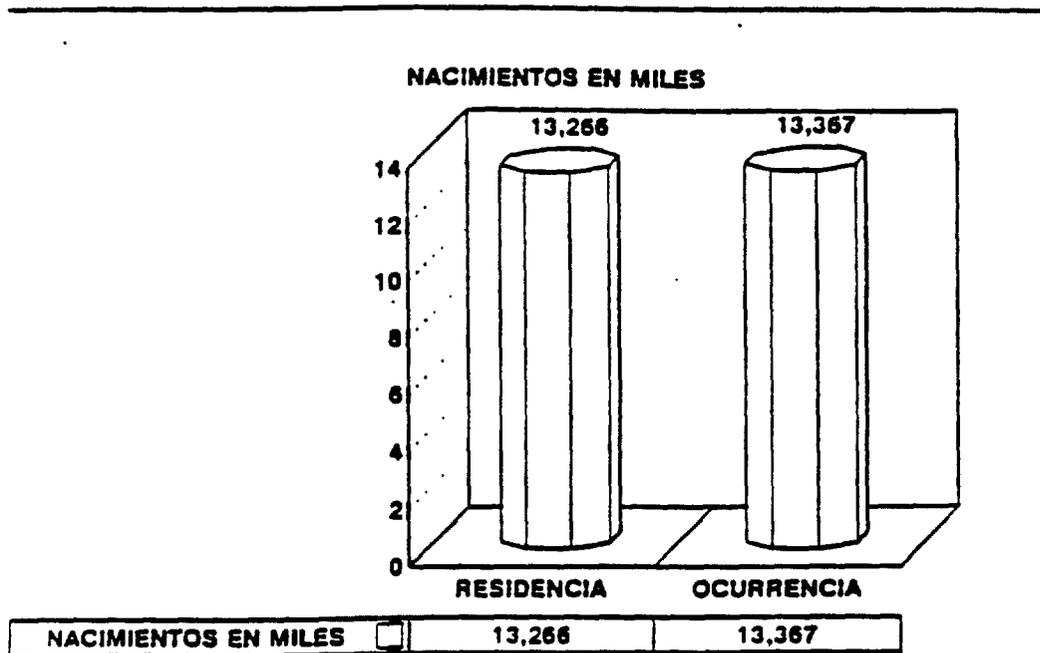
GRUPOS DE EDAD



PROYECCIONES 1980-2000 SEGEPLAN

GRAPHIC 2

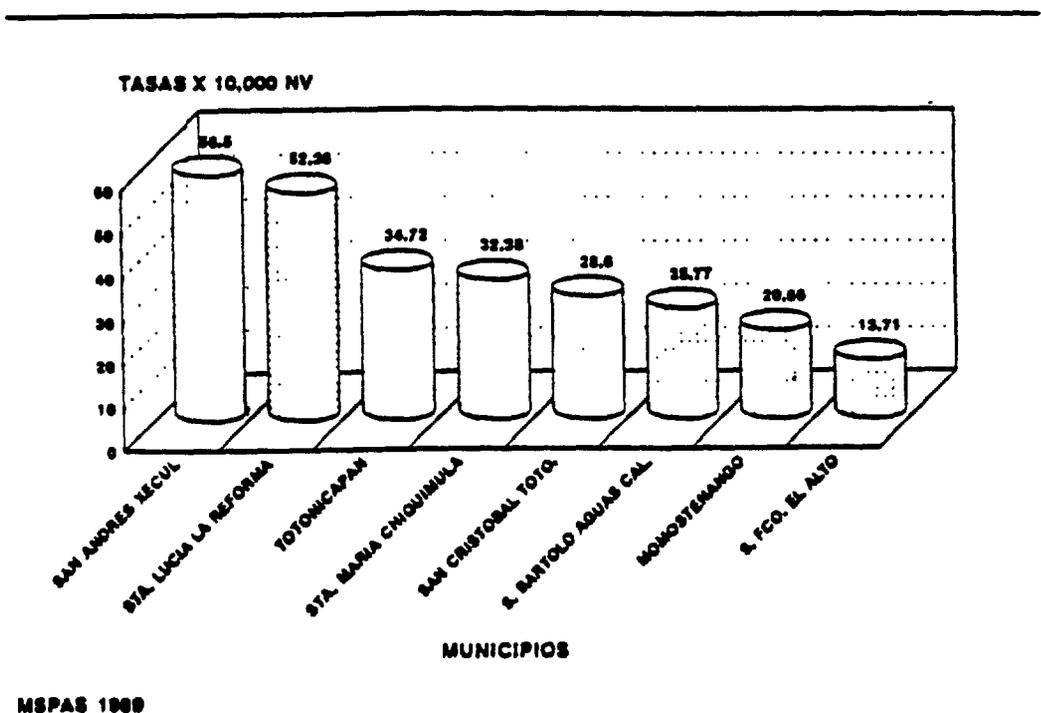
**BIRTHS BY WHERE THE DELIVERIES TOOK PLACE AND MOTHER'S RESIDENCE
DEPARTMENT OF TOTONICAPAN, 1990**



Estadísticas Vitales INE, 1990

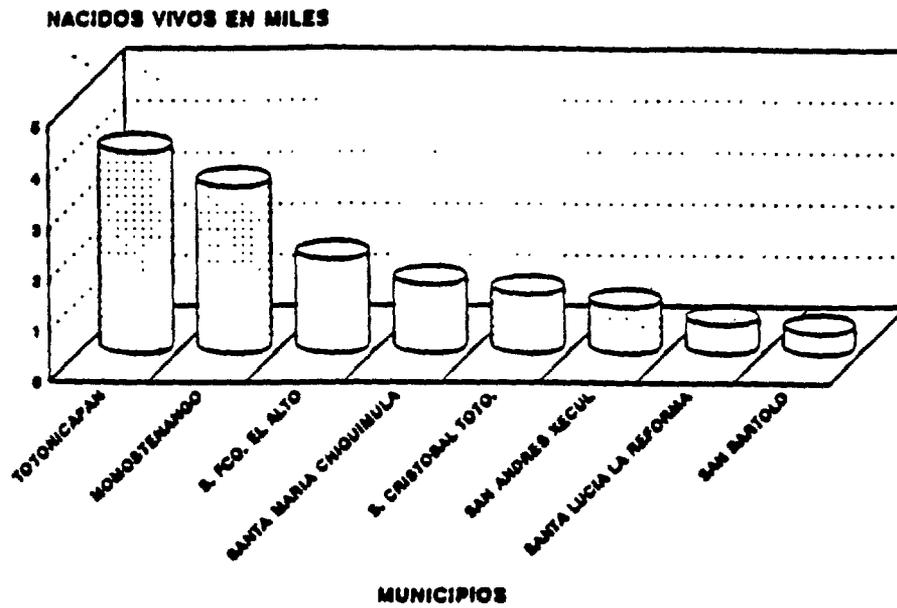
GRAPHIC 3

NUMBER OF MOTHER DEATHS IN 1989, BY MUNICIPAL DEPARTMENT OF TOTONICAPAN



GRAPHIC 4

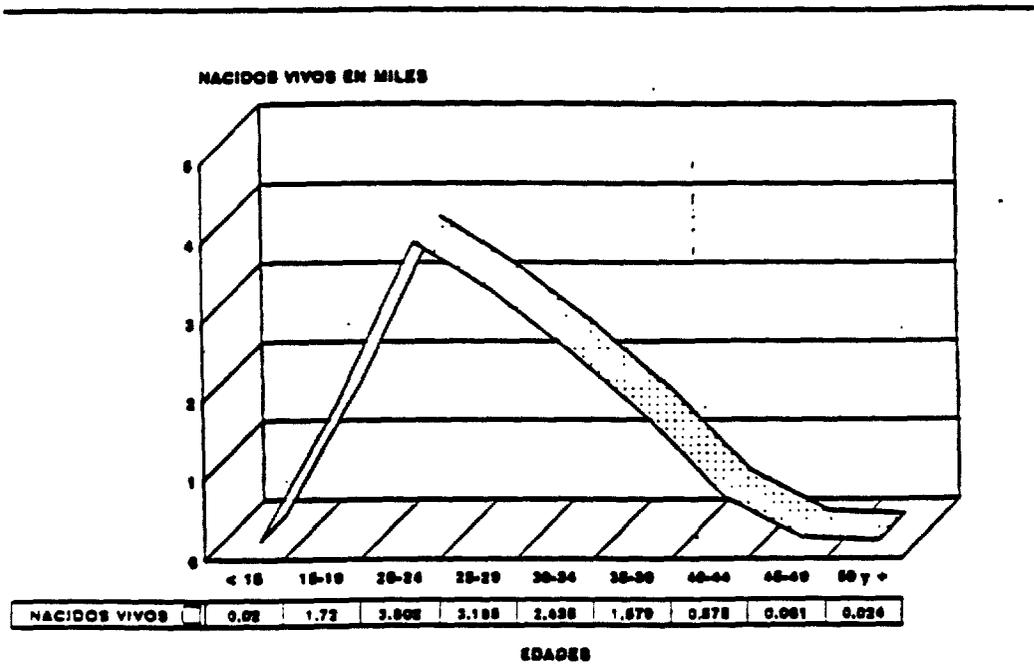
**NUMBER OF BIRTHS IN 1990,
BY MOTHER'S MUNICIPAL OF RESIDENCE
DEPARTMENT OF TOTONICAPAN**



ESTADISTICAS VITALES INE, 1968-1990

GRAPHIC 5

**NUMBER OF BIRTHS IN 1990, BY MOTHER'S AGE
DEPARTMENT OF TOTONICAPAN**

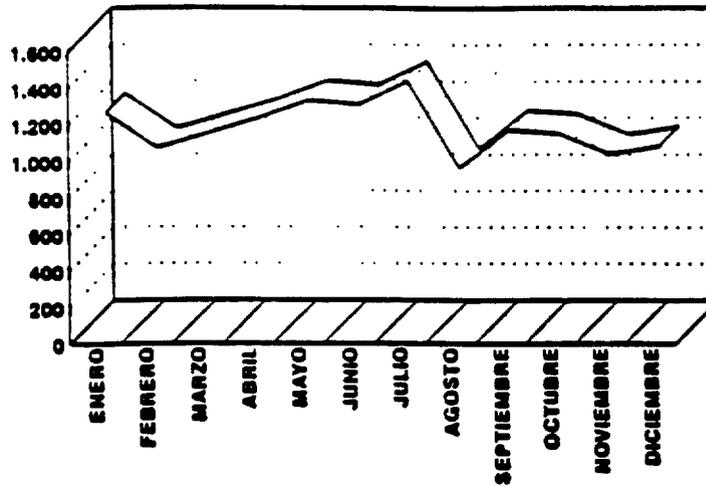


ESTADISTICAS VITALES INE, 1990-1990

GRAPHIC 6

**BORN ALIVE IN 1990
DEPARTMENT OF TOTONICAPAN
VARIATION THROUGH MONTHS OF THE YEAR**

NACIDOS VIVOS EN MILES



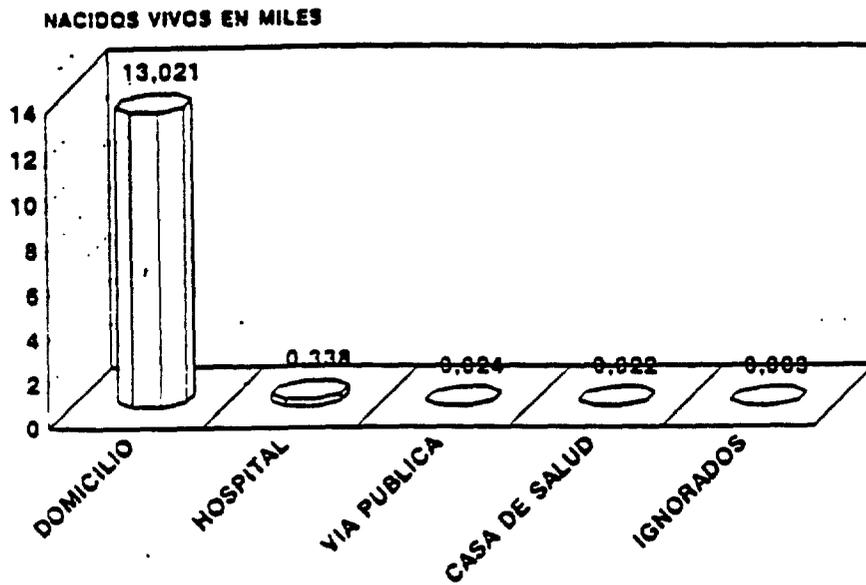
MESES	NUMERO DE NACIMIENTOS
ENERO	1.200
FEBRERO	1.069
MARZO	1.200
ABRIL	1.170
MAYO	1.270
JUNIO	1.247
JULIO	1.378
AGOSTO	901
SEPTIEMBRE	1.108
OCTUBRE	1.246
NOVIEMBRE	979
DICIEMBRE	1.022

MESES.

ESTADISTICAS VITALES INE, 1986-1990

GRAPHIC 7

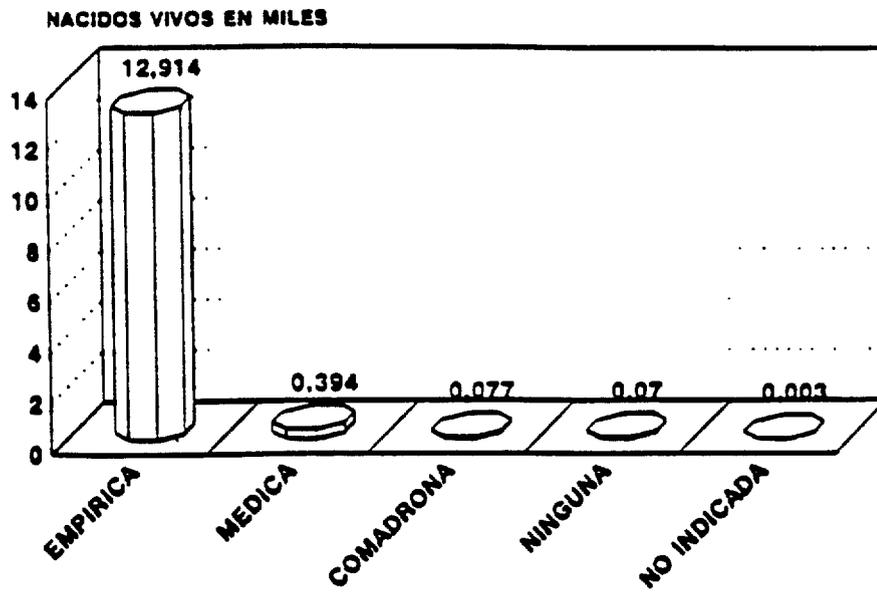
**NUMBER OF BIRTHS IN 1990,
BY WHERE THE DELIVERIES TOOK PLACE
DEPARTMENT OF TOTONICAPAN**



ESTADISTICAS VITALES INE, 1990-1990

GRAPHIC 8

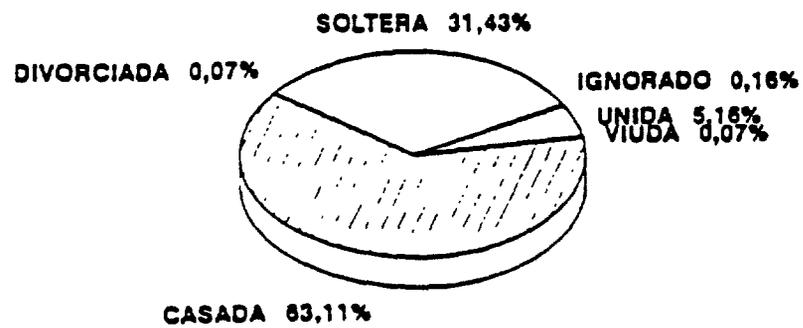
**NUMBER OF BIRTHS IN 1990, BY MOTHER RESIDENCE
DEPARTMENT OF TOTONICAPAN**



ESTADISTICAS VITALES INE. 1986-1990

GRAPHIC 9

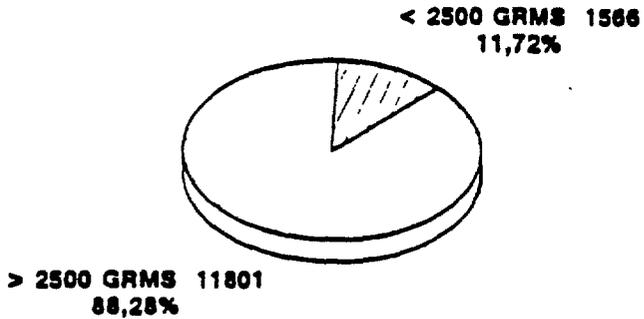
**NUMBER OF BIRTHS IN 1990, BY MOTHER CIVIL STATUS
DEPARTMENT OF TOTONICAPAN**



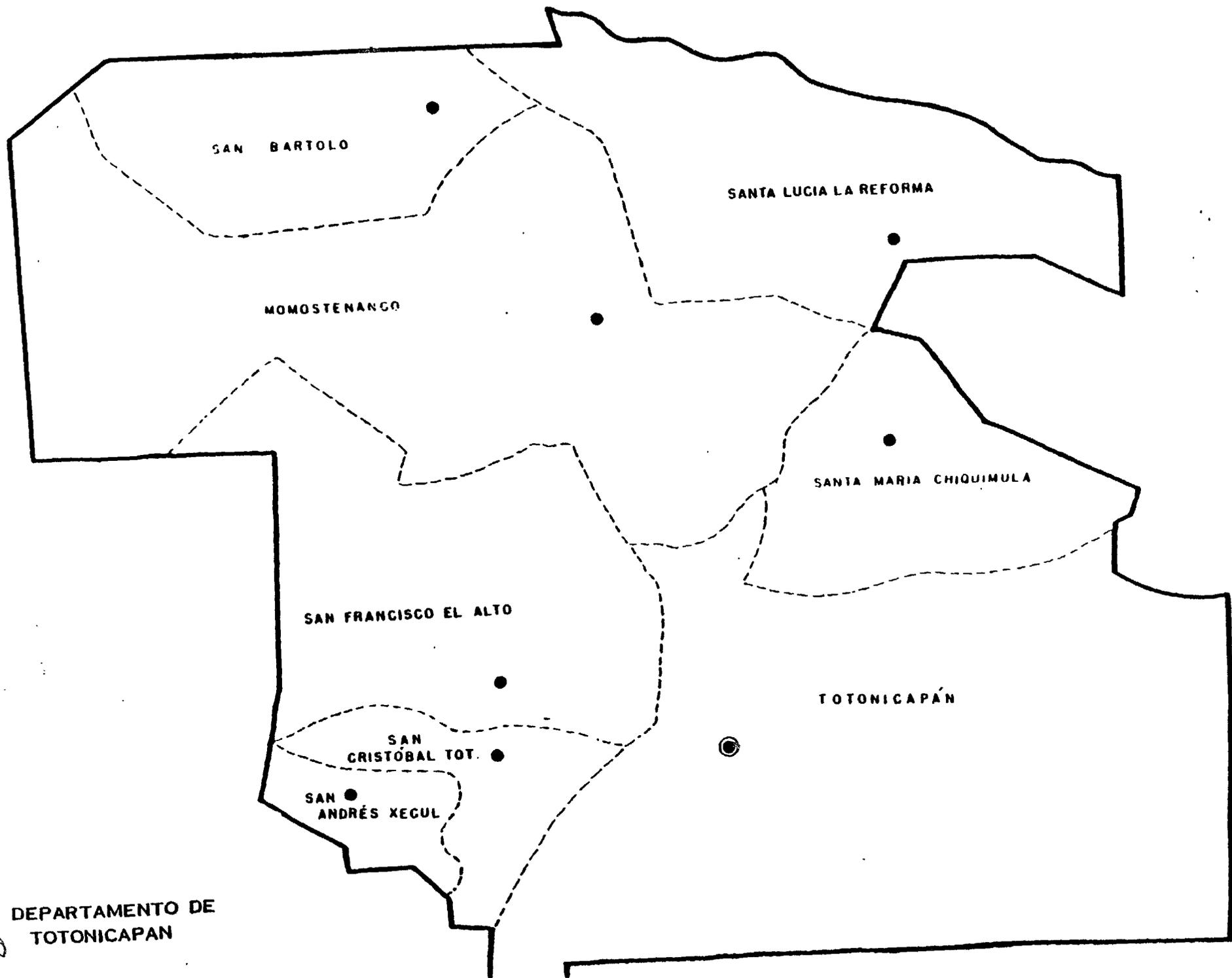
ESTADISTICAS VITALES INE. 1990-1990

GRAPHIC 10

**NUMBER OF BIRTHS IN 1990, BY BORN WEIGHT
AND MOTHER'S RESIDENCE
DEPARTMENT OF TOTONICAPAN**



ESTADISTICAS VITALES INE, 1986-1990



SAN BARTOLO

SANTA LUCIA LA REFORMA

MOMOSTENANGO

SANTA MARIA CHIQUIMULA

SAN FRANCISCO EL ALTO

TOTONICAPÁN

SAN CRISTÓBAL TOT.

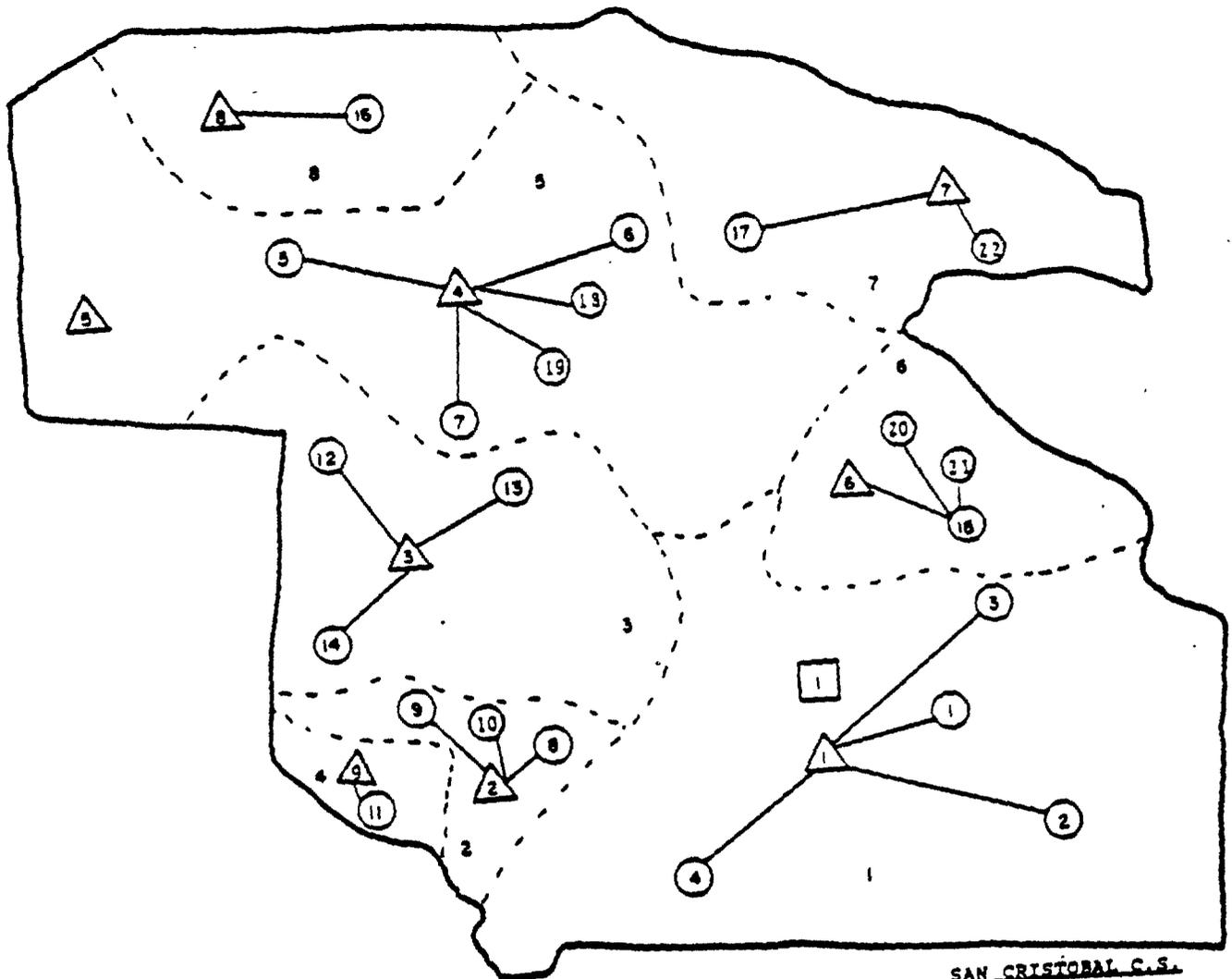
SAN ANDRÉS XECUL

DEPARTAMENTO DE
TOTONICAPAN

SR

^

TOTONICAPAN (8)



- MUNICIPIOS**
1. Totonicapan
 2. San Cristóbal Totonicapan
 3. San Francisco El Alto
 4. San Andrés Xecul
 5. Momostenango
 6. Santa María Chiquimula
 7. Santa Lucía La Reforma
 8. San Bartolo

HOSPITALES □

1. Totonicapan

CENTROS DE SALUD △

1. Totonicapan
2. San Cristóbal Totonicapan
3. San Francisco El Alto
4. Momostenango
5. San Vicente Buenabaj
6. Santa María Chiquimula
7. Santa Lucía La Reforma
8. San Bartolo
9. San Andrés Xecul

PUESTOS DE SALUD ○

DISTRITOS

- TOTONICAPAN C.S.**
1. P.S. Barraneche
 2. P.S. Maczul
 3. P.S. Chipuac
 4. P.S. Panquix

- SAN CRISTÓBAL C.S.**
8. P.S. San Ramón
 9. P.S. Patachaj
 10. P.S. Nueva Candelaria
- SAN ANDRÉS XECUL C.S.**
11. P.S. Palomora
- SAN FRANCISCO EL ALTO C.S.**
12. P.S. Chivarreto
 13. P.S. Rancho de Teja
 14. P.S. San Antonio Sija
- MOMOSTENANGO**
5. P.S. Pueblo Viejo Tunayac
 6. P.S. Poloqua
 7. P.S. Xequemeyá
 18. P.S. Tzanjon
 19. P.S. Chinimabe
- SAN VICENTE BUENABAJ C.S.**
- SANTA MARÍA CHIQUIMULA C.S.**
15. P.S. Chucaca
 20. P.S. Xecachenaj
 21. P.S. El Rancho
- SAN BARTOLO C.S.**
16. P.S. Tierra Blanca
- SANTA LUCÍA LA REFORMA C.S.**
17. P.S. Pameria
 22. P.S. Sacasiquan

V. DEPARTMENT OF SOLOLA

A. SOCIO-DEMOGRAPHIC DESCRIPTION

Sololá is located in the western region of Guatemala, limiting to the North with the Departments of Totonicapán and Quiché; to the South with the Department of Suchitepequez; to the East with the Department of Chimaltenango; and to the West with the Departments of Quetzaltenango and Suchitepequez. (1)

The City of Sololá, cabecera departamental, has an altitude of 2,114 meters above sea level, a latitude of 14°46'26", and a longitude of 91°11'15".

This department has an extension of 1,061 square kilometers. Distance from the City of Sololá, cabecera departamental, to the City of Guatemala is 126 kms, by paved road. (1)

It has 19 municipal divisions (municipios) as follows. See Map

1. (1)

- | | |
|-----------------------------------|--|
| 1. Sololá | 12. San Pablo La Laguna (25 kms) |
| 2. Concepción (8 kms) | 13. San Pedro La Laguna (85 kms) |
| 3. Nahualá (29 kms) | 14. Santa Catarina Ixtahuacán (41 kms) |
| 4. Panajachel (9 kms) | 15. Santa Catarina Palopó (13 kms) |
| 5. Santiago Atitlán (62 kms) | 16. Santa Clara La Laguna (18 kms) |
| 6. San Andrés Semetabaj (17 kms) | 17. Santa Cruz La Laguna (7 kms) |
| 7. San Antonio Palopó (27 kms) | 18. Santa María Visitación (25 kms) |
| 8. San José Chacayá (6 kms) | 19. Santa Lucía Utatlán (13 kms) |
| 9. San Juan La Laguna (26 kms) | |
| 10. San Lucas Tolimán (42 kms) | |
| 11. San Marcos La Laguna (23 kms) | |

* In parentheses, distance in kilometers to the cabecera departamental.

Sololá has a projection of 265,902 inhabitants for 1994. From this population, 36.84% (97,967) live in the urban area and 63.16% (167,935) live in the rural area (2).

Graphic No. 1 shows the population pyramid. We can observe that the pyramid base is wide and the largest population is concentrated on the infant area, similar to the department of San Marcos.

Migratory movements do not affect the amount of births as in previous departments. This is a very stable population, as shown in Graphic 2. (3)

According to the Ministry of Public Health, the infant mortality rate for Sololá was 55 x 1,000 born alive in 1991, and a mortality for illnesses during the perinatal period of 84.81 x 100,000 inhabitants in 1990 (3). This department has a very high perinatal mortality rate, ranking in the third place for the country (3).

The maternal mortality rate estimated by the Ministry of Public Health was of 44.6% x 10,000 born alive for 1989, with an under record of 53%. Following are causes reported: hemorrhage 48%, toxemia 9%, sepsis 24%, complications from abortion 10%, others 9%. As mentioned previously, these maternal deaths could be prevented in most of the cases. (4)

Graphic 3 shows maternal deaths by municipio and the areas with the highest incidence of deaths.

We can notice that Sololá, Hahuala, Santa Catarina Ixtahuacán, Santiago Atitlan, San Lucas Tolimán and Santa Lucía have higher rates of births.

Considering ranges of age with higher fecundity, we can observe

that the group from 15 to 24 years of age has a higher rate or amount of births, with a marked increase from the age of 15. (See Graphic 3.) (3)

We did not observe any significant variation regarding the amount of births per month. It keeps constant throughout the year. (See Graphic 4.)

Births by place of delivery were as follows: 94.87% in the house; 4.25% in the hospital. Deliveries are performed by people with no previous training in a 98.51%. (See Graphic 5 and 6.) (3)

The marital status of mothers was as follows: married women, 53.91%; single women 17.96%; and women living with a man without being married, 27.83%. (See Graphic 7.) (3)

We could also observe that low-birth weight has a prevalence of 11.5% for this department, as shown by vital statistics. (See Graphic 8.) (3)

B. RESOURCES AND STRUCTURE OF THE HEALTH SYSTEM IN THE DEPARTMENT OF SOLOLA

Sololá has 19 municipal divisions, and the health system has been divided into 7 districts.

It has one hospital, the National Hospital of Sololá, with a capacity for 100 beds; there are no type "A" health centers; and there are 8 Type "B" health centers, and 31 health posts. (See Map 2 for more detail).

Table 1 shows human resources in the National Hospital of Sololá, which has been working since 1970. Qualified human resources

available for the mother-child group is limited.

This hospital has 103 beds and there are no facilities for newborns. 24 beds are assigned for the pediatrics department and 21 beds for post-partum, post-cesarean and post-abortion.

In 1994, eight maternal deaths occurred in this hospital and there was a rate of 847.46 x 100,000 born alive. As indicated by Dr. Rene Velasquez, acting director of the hospital (Dr. Cesar H. Caballeros, director, was on vacation), this rate is too high for a hospital. Mortality occurs due to the late reference made by birth attendants as well as their lack of knowledge.

We interviewed Mr. Nicolas Say and Emilio Zelada, in charge of medical records. They provided statistical information on amount of deaths, deliveries, legrados and cesarean sections for 1994.

Information is recorded in an irregular way and usually it is not available. We had to tabulate some statistics based on the record sheets used by the Ministry of Public Health.

We found that the amount of cesarean sections performed is very high (41%). The acting director indicated this is due to the late references and the urgency to resolve these cases. (See Table 2.)

This hospital has the smallest amount of births in comparison with other hospitals evaluated.

Regarding evaluation of essential elements recommended by WHO for such an institution, this hospital is in good condition. However, availability of essential drugs was only 70.69%. (See Table 3.)

We interviewed Mrs. Silvia Marina Rodriguez, Chief Nurse at the hospital, who has been working with the Ministry for 23 years. She

said that she has not received any training from the Ministry in the mother-child area; that the MotherCare intervention would be very interesting; and that she would be willing to work in the training of birth attendants.

The Chief Nurse from the Head Area was on vacation.

We also talked with the Area Chief, Dr. Jose Nestor Carrillo Cordon, who provided the epidemiological information required. Unfortunately the exact amount of traditional birth attendants was not available, but he indicated there are more than 600 birth attendants in the Department of Sololá.

Dr. Carrillo showed a great deal of interest in the MotherCare methodology and would be willing to participate with the project. He thinks it would help to reduce maternal and child mortality in this department.

We also interviewed Mr. Juan Marcelo Tutz, acting director of K'amolBey (a non-government organization). He indicated this organization would also train birth attendants in 1995, and that he would like to work jointly with MotherCare to take advantage of the training materials available for traditional birth attendants.

This organization is financed by Christian Children and its main objectives are: health, education, programs to improve psycho-motor development.

C. RECOMMENDATIONS

1. This hospital needs a technical intervention to improve the quality of attention. The preparation of management protocols is feasible.

2. Table 4 summarizes those municipios which should receive priority in the training of birth attendants due to its high rates of maternal and infant mortality. They are in priority rank:
 1. Concepción
 2. Santa Clara La Laguna
 3. Nahualá
 4. Santa Cruz La Laguna
 5. Santa Catarina
 6. Sololá
3. A possible interaction with Christian Children should be considered. This organization finances a project, K'amol-Bey, which is planning to train birth attendants in 1995 in the areas of Tierra Linda, Doña Blanca, San Isidro, and Monte Mercedes. Dr. Lucy Garcia Tobias is in charge of this activity.

TABLE 1

AVAILABLE HUMAN RESOURCES
NATIONAL HOSPITAL OF SOLOLA

PERSONNEL	AMOUNT	PERCENTAGE
1. Gyneco-obstetricians	0	0.0
2. Pediatricians	0	0.0
3. Surgeons	1	2.0
4. Internal physicians	0	0.0
5. Anesthesiologists	0	0.0
6. General physicians	10	20
7. Chief nurses	7	14
8. Auxiliary nurses	32	64
9. Registered birth attendants	0	0.0
TOTAL	50	100.0

TABLE 2

PRODUCTION OF SERVICES
1994

TYPE OF PATIENT	AMOUNT	PERCENTAGE
1. Deliveries	557	59.0
2. Cesarean sections	387	41.0
TOTAL	944	100.00
3. Legrados	110	
4. Prenatal controls	552	

TABLE 3
EVALUATION OF ESSENTIAL ELEMENTS FOR OBSTETRIC ATTENTION
AT THE PRIMARY LEVEL OF REFERENCE
1994

PARAMETER EVALUATED	PERCENTAGE
Instruments for laparotomy	100
Clothes and other	100
Instruments for deliveries	100
Instruments for evacuation of the uterus	100
Instruments for neonatal resuscitation	75.0
Equipment for anesthesia	91.67
Resources for laboratory	100
Blood bank	100
Essential drugs	70.69

**FINAL CONSOLIDATION FOR DECISION MAKING ON THE SELECTION OF MUNICIPALS
FOR A POSSIBLE INTERVENTION BY MOTHERCARE**

MUNICIPAL	MATERNAL MORTALITY RATE 1989 X 100,000 BORN ALIVE ¹	INFANT MORTALITY RATE 1993 X 1,000 BORN ALIVE ²	BIRTHS 1993 ²	DISTANC E Kms ³	AMOUNT OF HEALTH POSTS ⁴
1. Concepción	1,587.30	40.54	148	8	5
2. Santa Clara La Laguna	1,333.33	102.15	186	18	1
3. Nahualá	761.61	121.64	1,562	29	3
4. Santa Cruz La Laguna	625.00	57.97	138	7	2
5. Santa Catarina Ixt.	580.27	68.29	864	41	6
6. Sololá	546.99	109.63	2,326	-----	5
7. San Juan La Laguna	480.77	121.85	238	26	1
8. San Antonio Palopo	362.32	30.98	355	27	0
9. Santa Lucia Utatlan	335.57	25.68	584	13	1
10. Santiago Atitlan	248.14	42.36	1,015	62	0
11. San José Chacayá	0	86.21	58	6	1
12. San Andres Semetabaj	0	31.96	219	17	3
13. Panajachel	0	44.71	146	9	0
14. Santa Catarina Palopo	0	74.47	106	13	1
15. San Lucas Tolimán	0	49.41	688	42	0
16. San Pablo La Laguna	0	67.41	178	25	0
17. San Marcos La Laguna	0	90.9	44	23	1
18. San Pedro La Laguna	0	87.87	239	85	1
19. Santa María Visitación	0	62.21	46	25	1
TOTAL	446.32	80.96	9,140		26

- 1 Estudio de Mortalidad Materna en Guatemala 1,989. MSPAS/DGSS/Materno Infantil, OPS/OMS/Mother-Care.
- 2 Estudio de Mortalidad Materna en Guatemala 1,989. MSPAS/DGSS/Materno Infantil, OPS/OMS/Mother-Care.
- 3 Estudio de Mortalidad Materna en Guatemala 1,989. MSPAS/DGSS/Materno Infantil, OPS/OMS/Mother-Care.
- 4 Red de Establecimientos del Ministerio de Salud Publica y Asistencia Social, Unidad de Informatica 1994.

DEPARTMENT OF SOLOLA
SERVICES BY MUNICIPAL

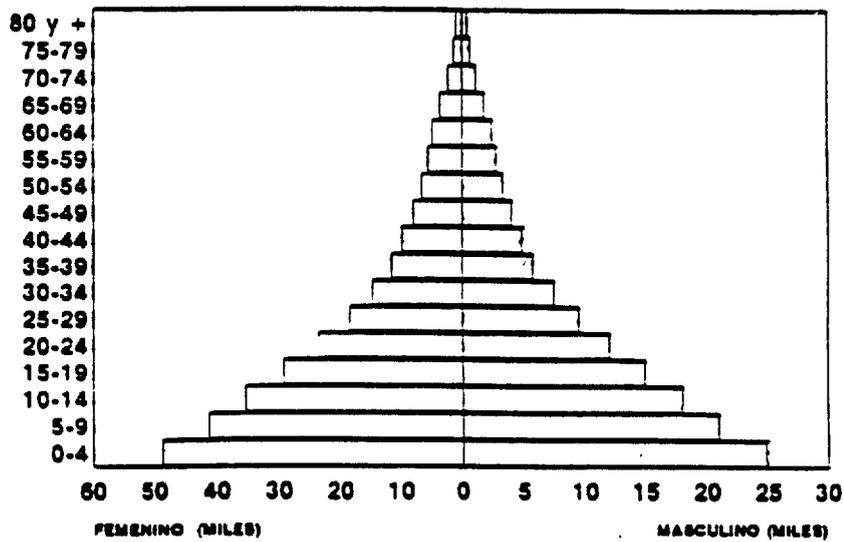
MUNICIPAL	HOSPITALS	HEALTH CENTER	HEALTH POST
1. Sololá	1. Sololá	1. Sololá	1. Pixabaj 2. Argueta 3. El Tablón 4. Los Cipresales 5. Los Encuentros
2. San Jose Chacaya			1. San José Chacaya
3. Santa María Visitación			1. Santa Maria Visitación
4. Santa Lucía Utatlan		1. Santa Lucía Utatlan	1. Pamesabal
5. Nahualá		1. Nahualá	1. Xejuyup 2. Pachipac 3. Palacal
6. Santa Catarina Ixtahuacán			1. Santa Catarina Ixtahuacán 2. Guineales 3. La Ceiba 4. Tzampoj 5. Chirijox 6. Camache
7. Santa Clara La Laguna			1. Santa Clara La Laguna
8. Concepción			1. Concepción 2. Patzutzún
9. San Andres Semetabaj			1. San Andres Semetabaj 2. Godínez 3. Las Canoas
10. Panajachel		1. Panajachel	
11. Santa Catarina Palopo			1. Santa Catarina Palopo
12. San Antonio Palopo			1. San Antonio Palopo 2. Agua Escondida
13. San Lucas Tolimán		1. San Lucas Tolimán	
14. Santa Cruz La Laguna			1. Santa Cruz La Laguna 2. Tzununa
15. San Pablo La Laguna		1. San Pablo La Laguna	
16. San Marcos La Laguna			1. San Marcos La Laguna
17. San Juan La Laguna			1. San Juan La Laguna
18. San Pedro La Laguna		1. San Pedro La Laguna	
19. Santiago Atitlan		1. Santiago Atitlan	1. Cerro de Oro

GRAPHIC 1

POPULATION PYRAMID OF DEPARTMENT OF SOLOLA BY AGE AND SEX GROUPS

Projections 1994

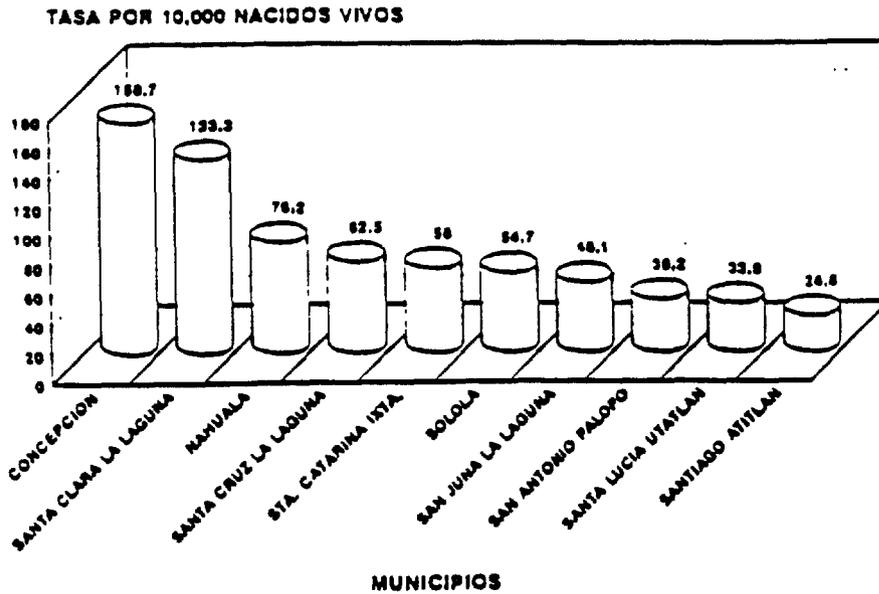
GRUPOS DE EDAD



PROYECCIONES 1980-2000 SEGEPLAN

GRAPHIC 2

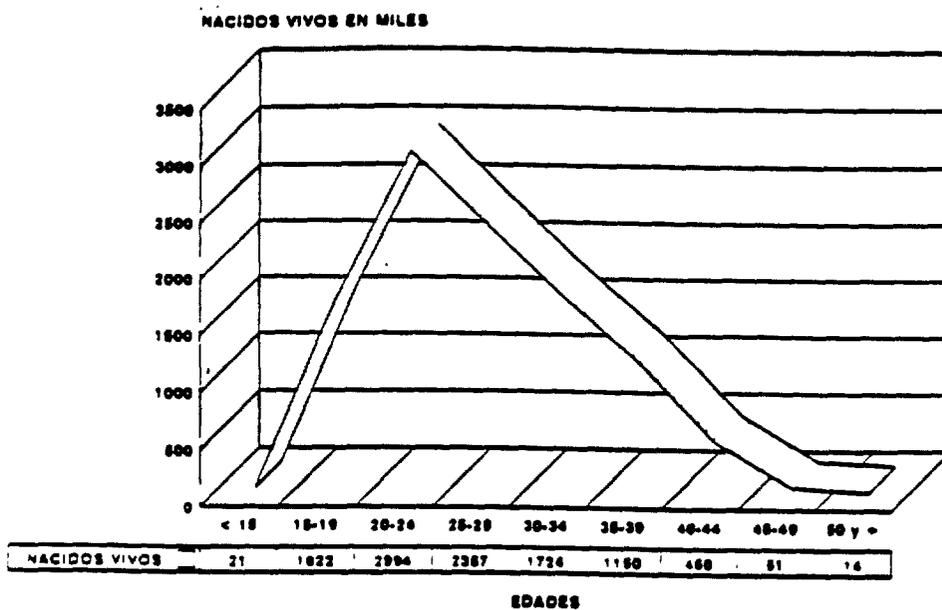
NUMBER OF MOTHER DEATHS IN 1990, BY MUNICIPAL DEPARTMENT OF SOLOLA



ESTADISTICAS VITALES INE. 1986-1990

GRAPHIC 3

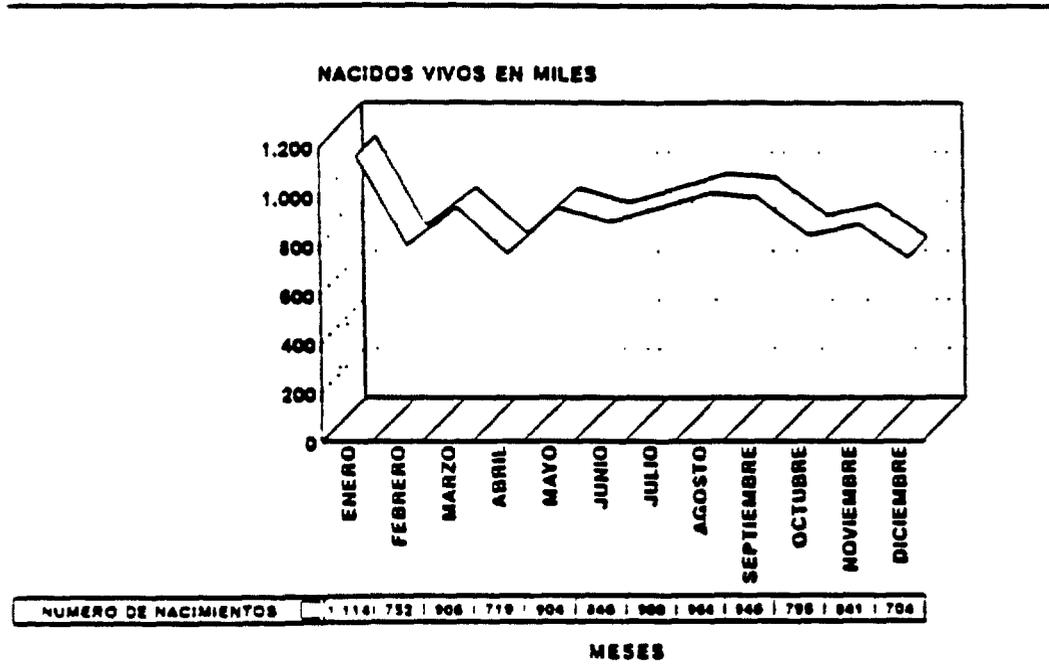
NUMBER OF BIRTHS IN 1990, BY MOTHER AGE DEPARTMENT OF SOLOLA



ESTADISTICAS VITALES INE, 1986-1990

GRAPHIC 4

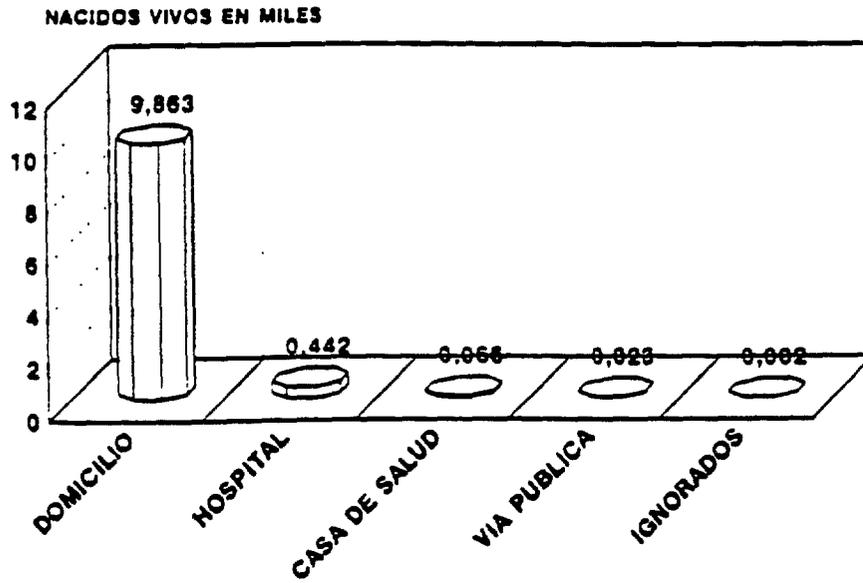
**BORN ALIVE IN 1990
DEPARTMENT OF SOLOLA
VARIATION THROUGH MONTHS OF THE YEAR**



ESTADISTICAS VITALES INE. 1986-1990

GRAPHIC 5

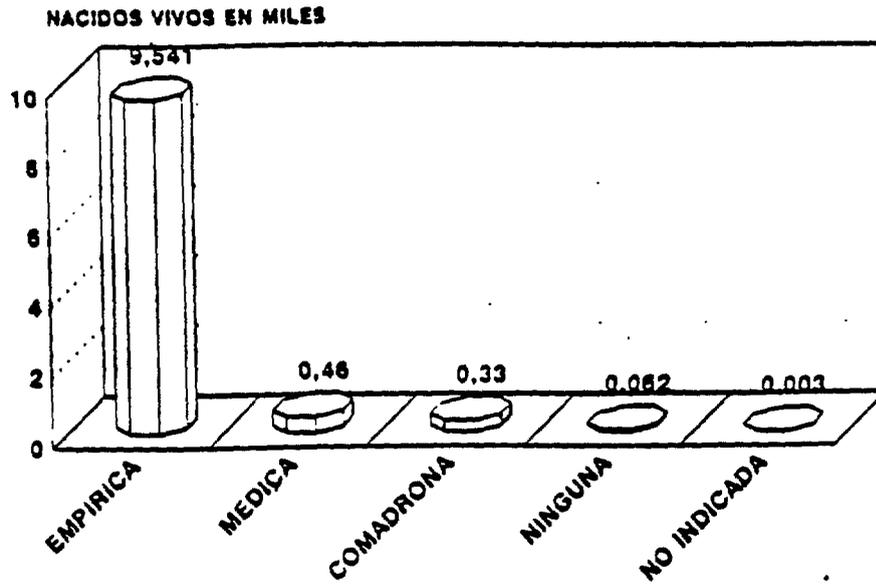
**BIRTHS BY WHERE THE DELIVERY TOOK PLACE
DEPARTMENT OF SOLOLA 1990**



ESTADÍSTICAS VITALES INE, 1986-1990

GRAPHIC 6

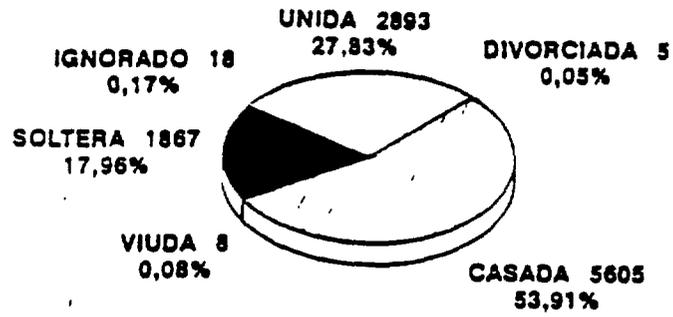
**NUMBER OF BIRTHS IN 1990, BY MOTHER RESIDENCE
DEPARTMENT OF SOLOLA**



ESTADISTICAS VITALES INE, 1966-1990

GRAPHIC 7

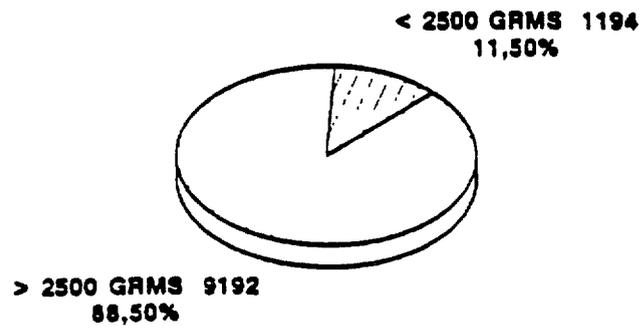
**NUMBER OF BIRTHS IN 1990, BY MOTHER CIVIL STATUS
DEPARTMENT OF SOLOLA**



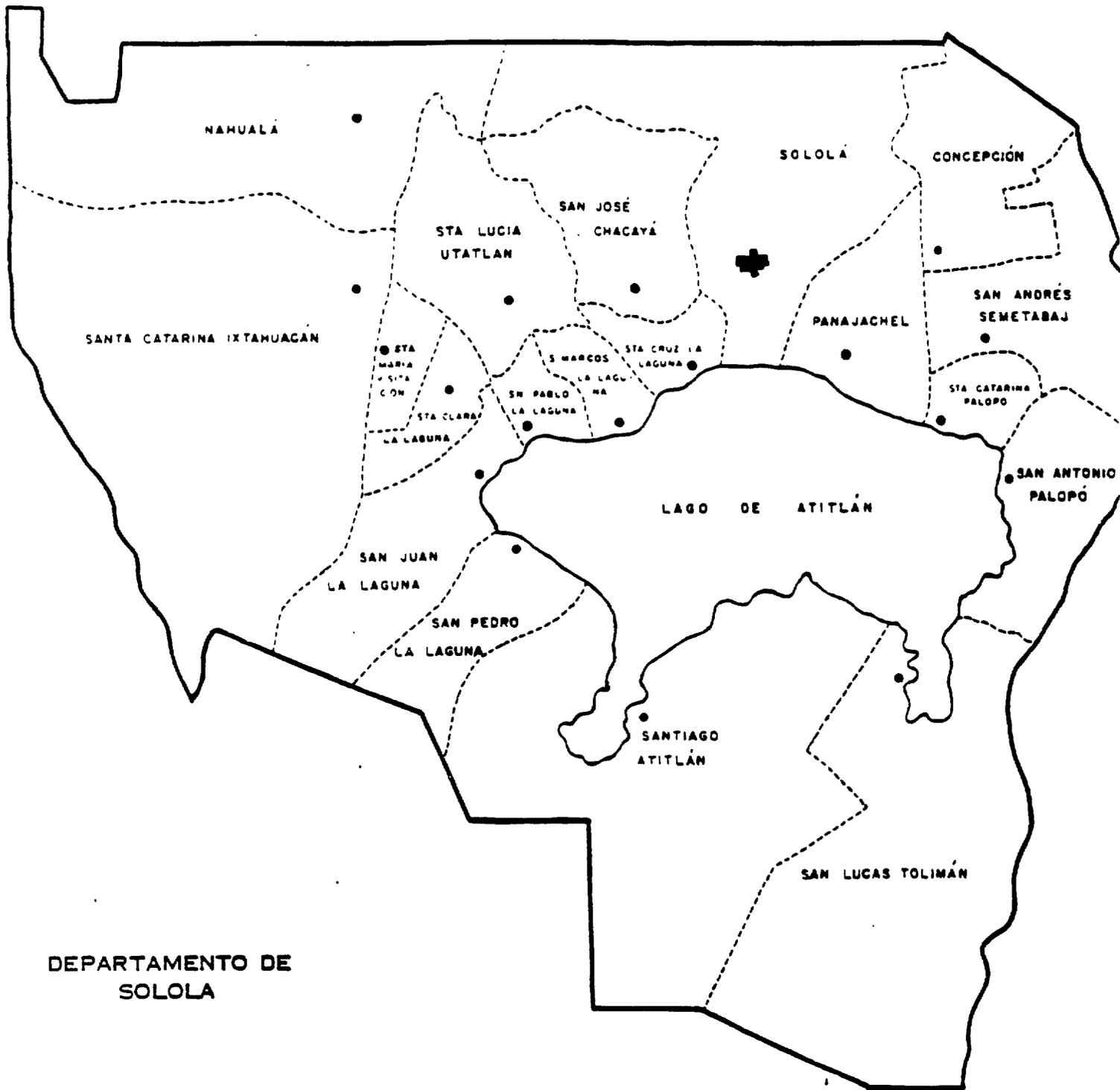
ESTADISTICAS VITALES INE. 1986-1990

GRAPHIC 8

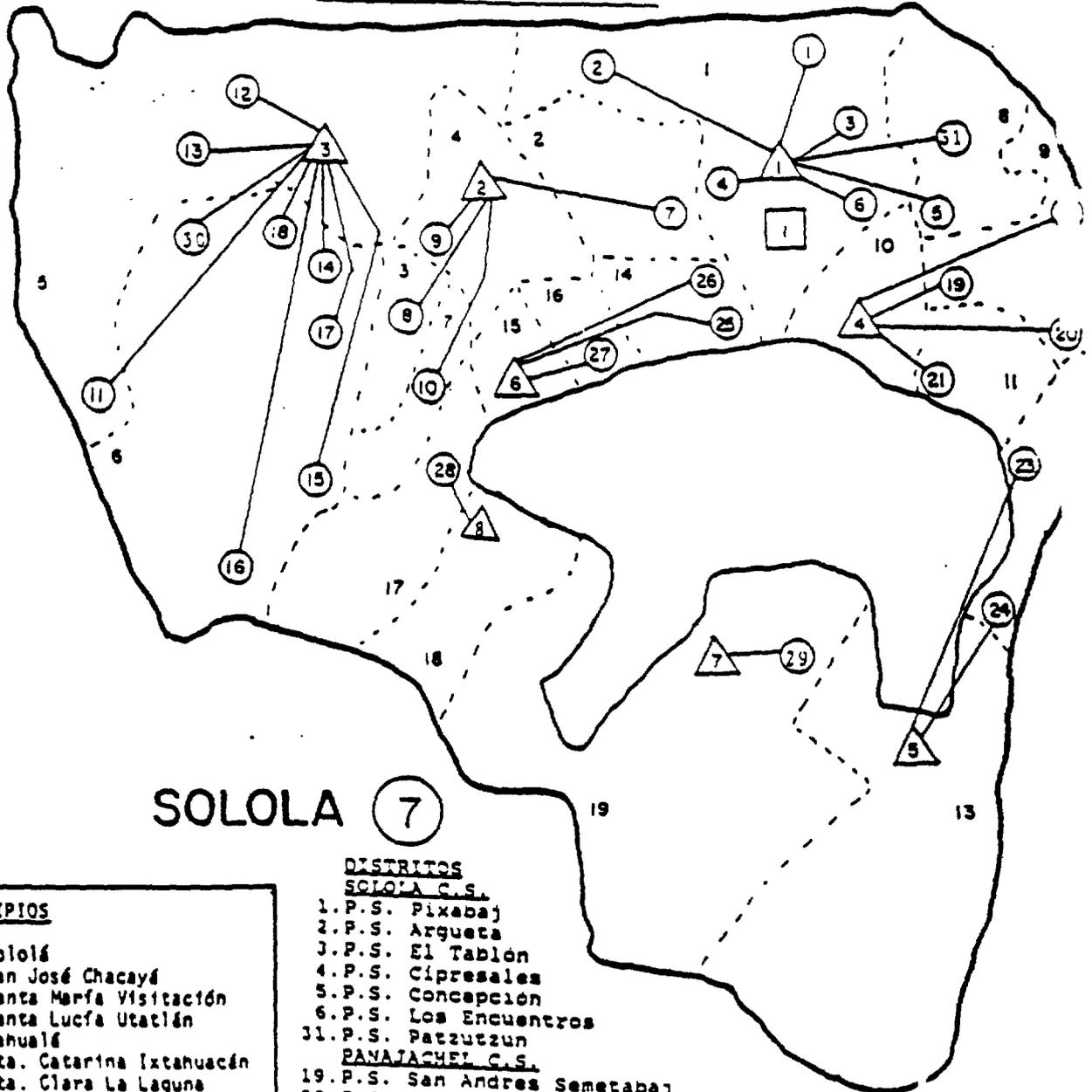
**NUMBER OF BIRTHS IN 1990,
BY BORN WEIGHT AND MOTHER RESIDENCE
DEPARTMENT OF SOLOLA**



ESTADISTICAS VITALES INE. 1986-1990



DEPARTAMENTO DE
SOLOLA



SOLOLA 7

MUNICIPIOS

1. Sololá
2. San José Chacayá
3. Santa María Visitación
4. Santa Lucía Utatlán
5. Nahuatlá
6. Sta. Catarina Ixtahuacán
7. Sta. Clara La Laguna
8. Concepción
9. San Andrés Semetabaj
10. Panajachel
11. Santa Catarina Palopó
12. San Antonio Palopó
13. San Lucas Tolimán
14. Santa Cruz La Laguna
15. San Pablo La Laguna
16. San Marcos La Laguna
17. San Juan La Laguna
18. San Pedro La Laguna
19. Santiago Atitlán

HOSPITALES

1. Sololá

CENTROS DE SALUD △

1. Sololá
2. Santa Lucía Utatlán
3. Nahuatlá
4. Panajachel
5. San Lucas Tolimán
6. San Pablo La Laguna
7. Santiago Atitlán
8. San Pedro La Laguna

DISTRITOS
SOLOLA C.S.

1. P.S. Pixabaj
2. P.S. Argueta
3. P.S. El Tablón
4. P.S. Cipresales
5. P.S. Concepción
6. P.S. Los Encuentros
31. P.S. Patzún

PANAJACHEL C.S.

19. P.S. San Andrés Semetabaj
20. P.S. Godínez
21. P.S. Sta. Catarina Palopo
22. P.S. Las Canoas

SAN LUCAS TOLIMAN C.S.

23. P.S. San Antonio Palopo
24. P.S. Agua Escondida
29. P.S. Cerro de Oro

SANTIAGO ATITLAN C.S.

7. P.S. San José Chacaya
8. P.S. Sta. María Visitación
9. P.S. Pamesabal
10. P.S. Sta. Clara La Laguna

NAHUATLA C.S.

11. P.S. Xejuyup
12. P.S. Pachipac
13. P.S. Palacal
14. P.S. Sta. Catarina Ixtahuacán
15. P.S. Guineales
16. P.S. La Ceiba
17. P.S. Tzampoj
18. P.S. Chirijox
30. P.S. Camacne

SAN PABLO LA LAGUNA C.S.

25. P.S. Santa Cruz La Laguna
26. P.S. Tzununa
27. P.S. San Marcos La Laguna

SAN PEDRO LA LAGUNA C.S.

28. P.S. San Juan La Laguna

PUESTOS DE SALUD ○

VI. DEPARTMENT OF CHIMALTENANGO

A. SOCIO-DEMOGRAPHIC DESCRIPTION

Chimaltenango is located in the central region of Guatemala, limiting to the North with the Departments of Quiche and Baja Verapaz; to the South with the Departments of Escuintla and Suchitepequez; and to the East with the Department of Sololá. (1)

The City of Chimaltenango, cabecera departamental, has an altitude of 1,800 meters above sea level, a latitude of 14°39'20", and a longitude of 90°49'20".

This department has an extension of 1,979 square kilometers. It has 16 municipal divisions (municipios) as follows. See Map 1. (1)

- | | |
|------------------------------|-------------------------------------|
| 1. Chimaltenango (30 kms) | 10. San José Poaquil (47 kms) |
| 2. Acatenango (24 kms) | 11. San Martín Jilotepeque (21 kms) |
| 3. Comalapa (5 kms) | 12. Yepocapa (56 kms) |
| 4. El Tejar (10 kms) | 13. Santa Apolonia (38 kms) |
| 5. Parramos (15 kms) | 14. Santa Cruz Balanyá (23 kms) |
| 6. Patzicía (28 kms) | 15. Tecpán Guatemala (34 kms) |
| 7. Patzún (77 kms) | 16. Zaragoza (9 kms) |
| 8. Pochuta (5 kms) | |
| 9. San Andrés Itzapa (5 kms) | |

* In parentheses, distance in kilometers to the cabecera departamental.

Chimaltenango has a projection of 374,898 inhabitants for 1994. From this population, 40.26% live in the urban area and 59.74 live in the rural area (2).

Graphic No. 1 shows the population pyramid. We can observe in this graphic that the pyramid base is wide and the largest population is concentrated on the infant area.

Migratory movements which could affect the amount of births do not influence seriously the birth rates, as shown in Graphic 2. (3)

According to the Ministry of Public Health, the infant mortality rate for Chimaltenango was 50.41 x 1,000 born alive in 1991, and a mortality for illnesses during the perinatal period of 70.04 x 100,000 inhabitants in 1990. This department has a very high perinatal mortality rate, ranking in the fifth place for the country. (3)

The maternal mortality rate estimated by the Ministry of Public Health was of 20.5% x 10,000 born alive for 1989, with an under record of 35%. Following are causes reported: hemorrhage 42%, toxemia 12%, sepsis 18%, complications from abortion 5%, others 21%. (4)

Graphic 3 shows maternal deaths by municipio, and the areas with the highest incidence of deaths are El Tejar, San Jose Poaquil, Santa Cruz Balanya, Patzicía, Yepocapa.

We can notice in Graphic 4 that San Martin Jilotepeque, Chimaltenango, Patzun, Comalapa and Patzicía have higher rates of births. (3).

Considering ranges of age with higher fecundity, we can observe that the group from 15 to 24 years of age has a higher rate or amount of births born alive. This indicates an early start in procreation, implicating that possibly no contraceptive methods are being used, as well as a lack of education in women. (See Graphic 5.) (3)

We observed a significative variation regarding the amount of births throughout the year, with higher peaks in the months of May and August. (See Graphic 6.) (3)

Considering the marital status of mothers, the amount of births in 1990 was higher for married women, 74.03%; for single women, 17.46%; and for women living with a man without being married, 8.00%

(See Graphic 7) (3).

Births by place of delivery were as follows: 92.89% in the house and 6.40% in the hospital, implicating a poor coverage for deliveries (See Graphic 8.) (3)

In a joint evaluation of the staff in charge of deliveries, we find that in a 90.83%, it was performed by a person with no previous training and in a 7.10%, by medical staff. This reflects the quality of attention provided to the mother-child group in this area. (See Graphic 9.) (3)

We could also observe that low birth weight has a prevalence of 5.07%, which is considered low in comparison with other departments. (See Graphic 10). (3)

B. RESOURCES AND STRUCTURE OF THE HEALTH SYSTEM IN THE DEPARTMENT OF CHIMALTENANGO

As previously mentioned, Chimaltenango has 16 municipal divisions, and the health system has been divided into 10 districts.

The Health Area Head has a well-equipped computer center financed by the Project Clapp & Mayne/AID. It also has a fax/telephone (No. 0391064), provided by the Ministry of Public Health to expedite communications between health areas and central offices of the Ministry.

It has two double-transmission cars. However, only one is operating as there are no resources for the maintenance of the other one.

Table 1 shows human resources by district.

There are 522 registered birth attendants, with 499 active. The Health Area Head and the different districts provide training for new personnel once a year, in a 15-day course. Follow-up course lasts three days. Subsequently, conferences are given every month throughout the year, with the objective to strengthen their knowledge.

Birth attendants are distributed in each municipio, in different amounts and percentages. (See Table 2.)

Training is also provided for voluntary health promoters. 490 have been trained with 50% (245) active, who interact with districts and Health Area Head. This training takes place annually; and, when possible, follow-up courses are provided monthly or bi-monthly.

This department has one hospital, The Integrated Hospital of Chimaltenango. When inaugurated on March 23, 1983, it had a capacity for 50 beds. Its general structure is in good condition.

This hospital has been remodeled and presently has a capacity for 65 beds and 12 cribs for newborns. The newborn service has incubators and basic resources for neonatology, providing a satisfactory attention for neonates.

Twenty beds are assigned to the Gyneco-Obstetrics Department, 20 to the Pediatrics Department, 15 to Internal Medicine, and 10 to Surgery.

Due to the small amount of beds for Gyneco-Obstetrics, patients can only stay 2.5 days in the hospital.

Human resources at this hospital are shown in Table 3.

Table 4 shows the annual production of the Gyneco-Obstetrics Department at this hospital.

An evaluation was made of essential elements for obstetric attention (recommended by WHO) and general working conditions. Results are shown on Table 5.

This department has two type "A" health centers, 7 type "B" health centers and 59 health posts, with a total of 69 buildings. (See Map 2 and Table).

Dr. Hector Eduardo Espinoza Vega, Chief of the Chimaltenango Health Area, and Mrs. Adelfa Candelaria Boj, Chief Nurse of the Area, were interviewed. Both of them indicated their willingness to support the MotherCare project. Depending on the size of this project, one or two auxiliary nurses could be provided to assist in its implementation.

Also, they have a list with names and addresses of birth attendants. If the MotherCare project requires it, their presence could be requested.

Based on epidemiological indicators such as infant and maternal mortality rates, Dr. Espinoza suggests the following municipios be included in the intervention:

1. Tecpan
2. Comalapa
3. Poaquil
4. Patzun
5. Pochuta
6. Yepocapa

These should be analyzed, as the rates reported by the Health Area have an under-record in regards to infant and mortality rates.

C. RECOMMENDATIONS

1. This Area is ideal for the Mothercare's intervention, as shown by its structure and the human resources available.
2. Areas should be analyzed. According to Table 6, the following municipios should be included in the intervention:
 - a) El Tejar
 - b) San Jose Poaquil
 - c) Santa Cruz Balanya
 - d) Patzicía
 - e) Yepocapa

TABLE 1

AVAILABLE HUMAN RESOURCES BY DISTRICT
DEPARTMENT OF CHIMALTENANGO

DISTRICT	PHYSICIANS	PROFESSIONAL NURSES	AUXILIARY NURSES
No. 1	19	8	60
No. 2	2	1	18
No. 3	1	1	13
No. 4	1	1	13
No. 5	1	1	9
No. 6	1	1	11
No. 7	1	1	9
No. 8	0	1	7
No. 9	1	1	4
No. 10	1	1	5
TOTAL	28	17	149

TABLE 2

**ACTIVE BIRTH ATTENDANTS BY MUNICIPAL
DEPARTMENT OF CHIMALTENANGO**

MUNICIPAL	AMOUNT	PERCENTAGE
1. Chimaltenango	40	7.66
2. Acatenango	25	4.79
3. Comalapa	75	14.37
4. El Tejar	15	2.87
5. Parramos	8	1.53
6. Patzicía	30	5.76
7. Patzún	60	11.49
8. Pochuta	18	3.45
9. San Andrés Itzapa	12	2.30
10. San José Poaquil	40	7.66
11. San Martín Jilotepeque	75	14.37
12. Yepocapa	18	3.45
13. Santa Apolonia	15	2.87
14. Santa Cruz Balanyá	8	1.53
15. Tecpán Guatemala	75	14.37
16. Zaragoza	8	1.53
TOTAL	522	100.00

TABLE 3
AVAILABLE HUMAN RESOURCES
HOSPITAL OF CHIMALTENANGO¹

PERSONNEL	AMOUNT	PERCENTAGE
1. Gyneco-obstetricians	1	1.06
2. Pediatricians	1	1.06
3. Surgeons	2	2.13
4. Internal physicians	1	1.06
5. Anesthesiologists	1	1.06
6. General physicians	5	5.32
7. Chief nurses	8	8.52
8. Auxiliary nurses	42	44.68
9. Registered birth attendants	33	35.11
TOTAL	94	100.0

¹ Hospital de Chimaltenango Departamento de Personal, 1994.

88

TABLE 4

PRODUCTION OF SERVICES
HOSPITAL OF CHIMALTENANGO
1994

TYPE OF PATIENT	AMOUNT	PERCENTAGE
1. Deliveries	1,642	83.55
2. Cesarean sections	300	16.45
TOTAL	1,942	100.00
3. Periosteotomies	270	
4. Prenatal controls	4,719	

TABLE 5

EVALUATION OF ESSENTIAL ELEMENTS FOR OBSTETRIC ATTENTION
AT THE PRIMARY LEVEL OF REFERENCE
HOSPITAL OF CHIMALTENANGO
1994

PARAMETER EVALUATED	PERCENTAGE
Instruments for laparotomy	81.8
Clothes and other	78.5
Instruments for deliveries	76.5
Instruments for evacuation of the uterus	75.5
Instruments for neonatal resuscitation	83.3
Equipment for anesthesia	83.3
Resources for laboratory	100.0
Blood bank	100.0
Essential drugs	69.0

TABLE 6
FINAL CONSOLIDATION FOR DECISION MAKING ON THE SELECTION OF MUNICIPALS
FOR A POSSIBLE INTERVENTION BY MOTHERCARE

MUNICIPAL	MATERNAL MORTALITY RATE 1989 X 100,000 BORN ALIVE ¹	INFANT MORTALITY RATE 1993 X 1,000 BORN ALIVE ²	BIRTHS ²	DISTANCE Kms ³	AMOUNT OF HEALTH POSTS ⁴	AMOUNT OF BIRTH ATTENDANTS ²
1. Chimaltenango	5.01	48.59	1,955	30	2	40
2. Acatenango	17.33	37.15	619	24	4	25
3. Comalapa	9.17	21.71	1,077	5	7	75
4. El Tejar	173.91	79.36	126	10	1	15
5. Parramos	-	78.43	204	15	2	8
6. Patzicía	47.51	41.20	631	28	1	30
7. Patzún	-	67.30	1,263	77	5	60
8. Pochuta	23.7	55.11	381	5	-	18
9. San Andrés Itzapa	-	57.55	417	5	2	12
10. San José Poaquil	67.0	81.04	691	47	6	40
11. San Martín Jilotepeque	26.9	39.31	1,704	21	8	75
12. Yepocapa	36.41	65.40	688	56	2	18
13. Santa Apolonia	-	128.93	349	38	2	15
14. Santa Cruz Balanya	56.5	31.05	161	23	2	8
15. Tecpán	10.69	46.74	1,583	34	10	75
16. Zaragoza	-	18.36	490	9	5	8
TOTAL	204.64	51.71	12,339		59	522

¹ Estudio de Mortalidad Materna en Guatemala 1,989. MSPAS/DGSS/Materno Infantil, OPS/OMS/Mother-Care.

² Jefatura de Area Departamento de Chimaltenango, Estadísticas 1993.

³ Instituto Geográfico de Guatemala.

⁴ Red de Establecimientos del Ministerio de Salud Pública y Asistencia Social, Unidad de Informatica 1994.

DEPARTMENT OF CHIMALTENANGO
SERVICES BY MUNICIPAL

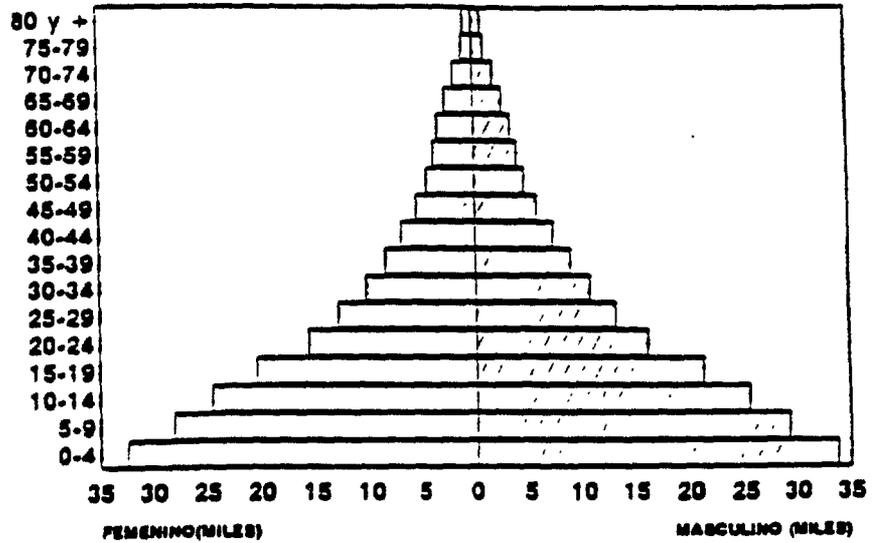
MUNICIPAL	HOSPITALS	HEALTH CENTER	HEALTH POST
1. Chimaltenango	1. Chimaltenango (Centro Integrado)		1. San Jacinto 2. Tonajuyu
2. San José Poaquil		1. San José Poaquil	1. Hacienda Maria 2. Palama 3. Saquitacaj 4. La Garrucha 5. Panimacac 6. Orejacaibal
3. San Martín Jilotepeque		1. San Martín Jilotepeque	1. Las Lomas Paraje Sacala 2. Los Jometes 3. Chipastor 4. Choatalum 5. De Las Escobas 6. Estancia de la Virgen 7. Estancia S.M.J. 8. El Rosario Canajal
4. San Juan Comalapa		1. San Juan Comalapa Tipo "A"	1. Simajuleu 2. Patzaj 3. Paquixic 4. Praxaj 5. Panabajal 6. Pamumus 7. Xiquin Sinai
5. Santa Apolonia			1. Santa Apolonia 2. Chipata Chuacacay
6. Tecpan Guatemala		1. Tecpan Guatemala Tipo "A"	1. Caliaj 2. Caquixajay 3. Xejavi 4. Palama 5. Xenimajuyu 6. Chirijuyu 7. Xecoxol 8. Agua Escondida 9. San José Chirijuyu 10. Pacacay
7. Patzun		1. Patzun	1. Xepatan 2. El Sitio 3. Xetzan Bajo 4. Cojobal Paraje Las Camelias 5. Chipiacul
8. Pochuta		1. Pochuta	

MUNICIPAL	HOSPITALS	HEALTH CENTER	HEALTH POST
9. Patzicia		1. Patzicia	1. Pahuít
10. Santa Cruz Balanya			1. Santa Cruz Balanya 2. Chimasat
11. Acatenango		1. Acatenango	1. San Antonio Nejapa 2. Quisache 3. De Los Pajales 4. El Socorro
12. Yepocapa		1. Yepocapa	1. Morelia 2. San Rafael Sumatan
13. San Andres Itzapa			1. San Andres Itzapa 2. Chimachoy
14. Parramos			1. Parramos 2. San Jose Parrojas
15. Zaragoza			1. Zaragoza 2. Rincon Grande 3. Las Lomas 4. Mencheren Grande 5. Puerta Abajo
16. El Tejar			1. El Tejar

GRAPHIC 1

POPULATION PYRAMID OF DEPARTMENT OF CHIMALTENANGO BY AGE AND SEX GROUPS Projections 1994

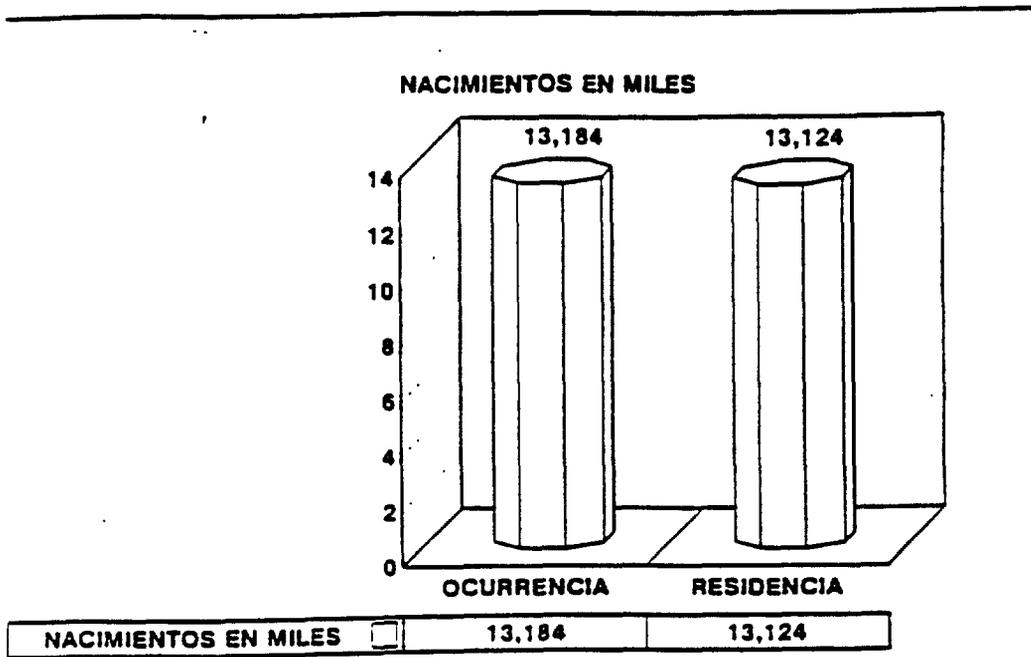
GRUPOS DE EDAD



PROYECCIONES 1980-2000 SEGEPLAN

GRAPHIC 2

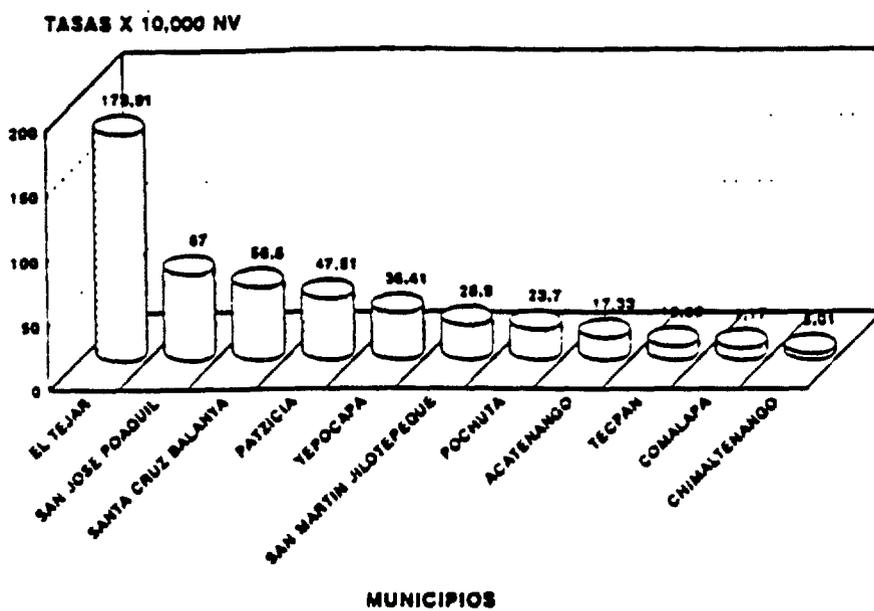
**BIRTHS BY WHERE THE DELIVERIES TOOK PLACE AND MOTHER'S RESIDENCE
DEPARTMENT OF CHIMALTENANGO, 1990**



Estadísticas Vitales INE, 1990

GRAPHIC 3

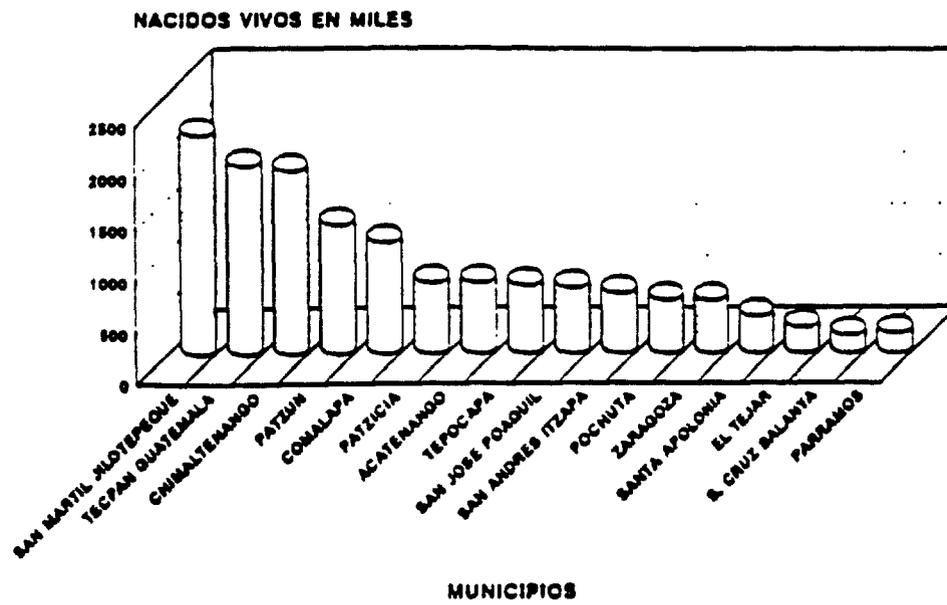
NUMBER OF MOTHER DEATHS IN 1989, BY MUNICIPAL DEPARTMENT OF CHIMALTENANGO



MSPAS 1989

GRAPHIC 4

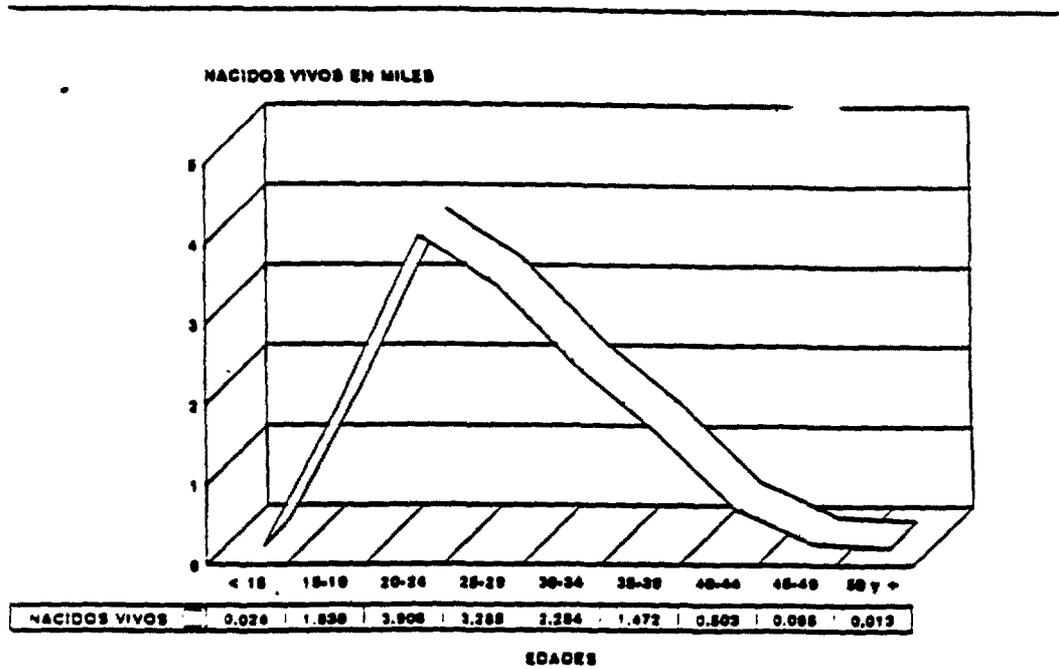
**NUMBER OF BIRTHS IN 1990,
BY MOTHER'S MUNICIPAL OF RESIDENCE
DEPARTMENT OF CHIMALTENANGO**



ESTADISTICAS VITALES INE, 1986-1990

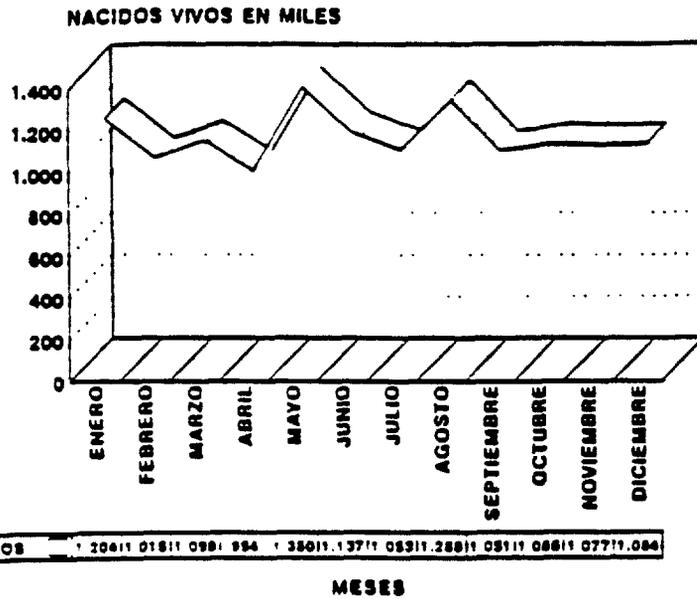
GRAPHIC 5

NUMBER OF BIRTHS IN 1990, BY MOTHER'S AGE DEPARTMENT OF CHIMALTENANGO



GRAPHIC 6

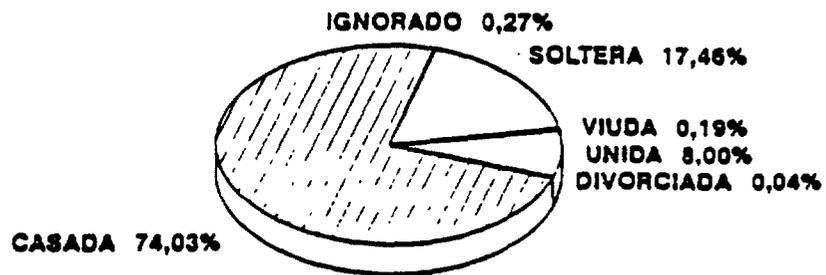
**BORN ALIVE IN 1990
DEPARTMENT OF CHIMALTENANGO
VARIATION THROUGH MONTHS OF THE YEAR**



ESTADISTICAS VITALES INE. 1986-1990

GRAPHIC 7

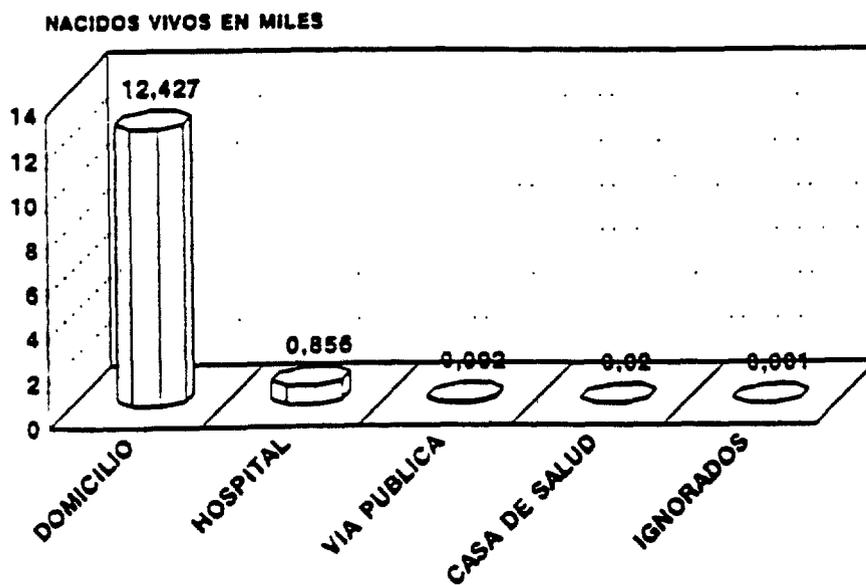
**NUMBER OF BIRTHS IN 1990, BY MOTHER CIVIL STATUS
DEPARTMENT OF CHIMALTENANGO**



ESTADISTICAS VITALES INE, 1986-1990

GRAPHIC 8

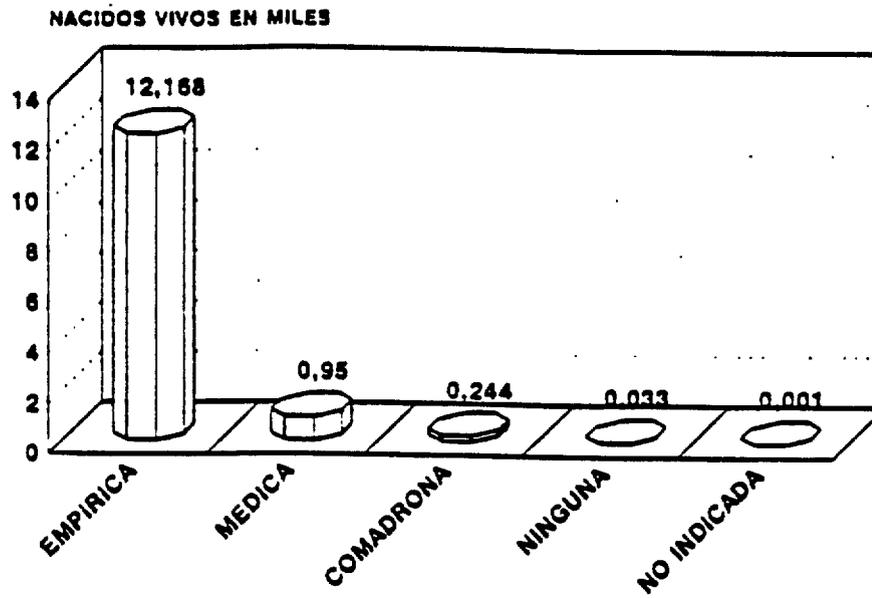
**NUMBER OF BIRTHS IN 1990,
BY WHERE THE DELIVERIES TOOK PLACE
DEPARTMENT OF CHIMALTENANGO**



ESTADISTICAS VITALES INE. 1989-1990

GRAPHIC 9

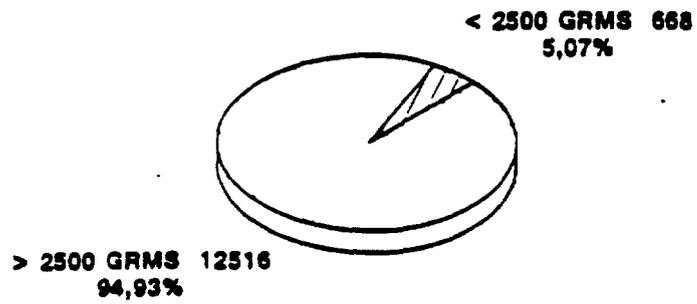
**NUMBER OF BIRTHS IN 1990, BY MOTHER'S RESIDENCE
DEPARTMENT OF CHIMALTENANGO**



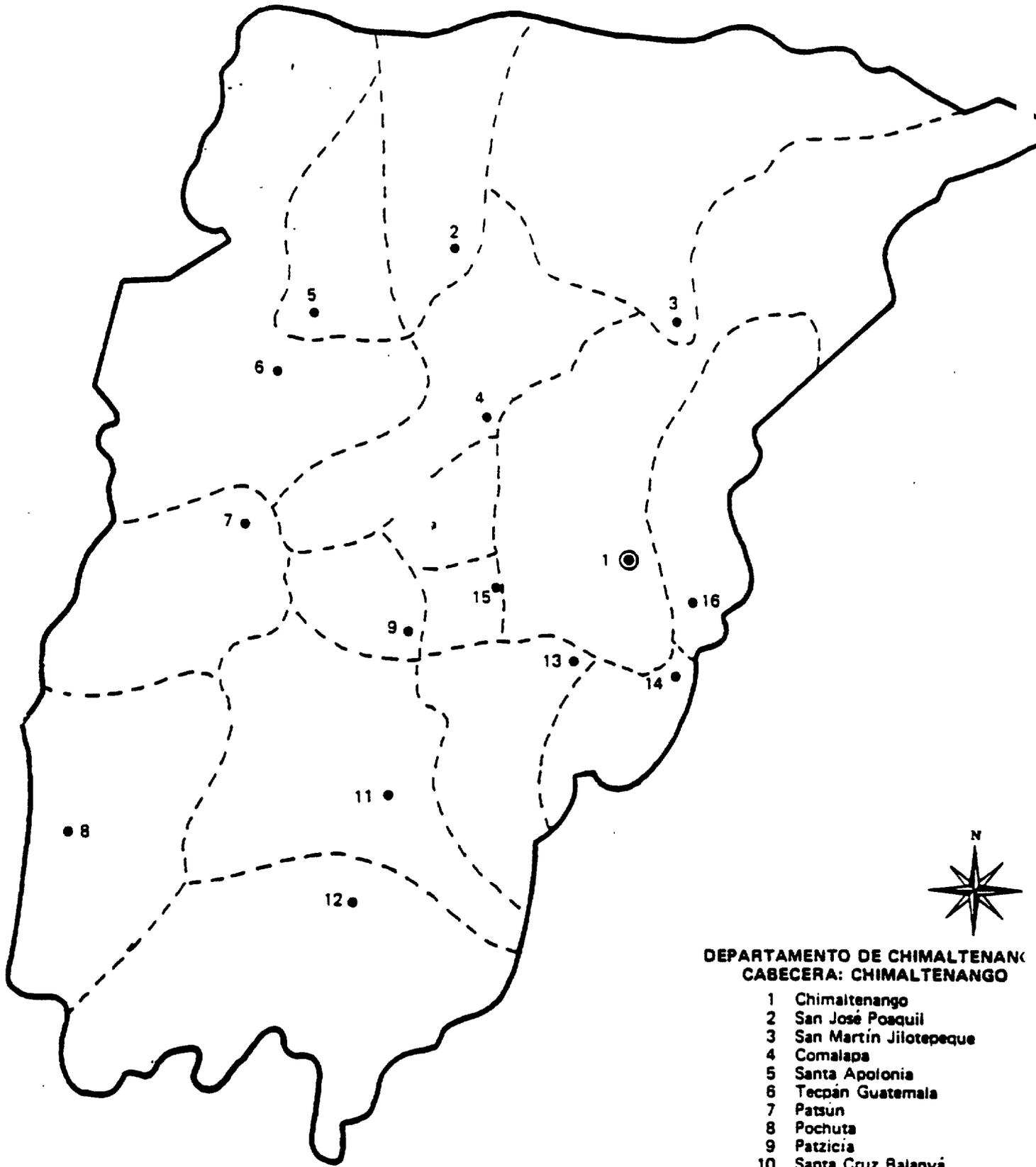
ESTADISTICAS VITALES INE. 1986-1990

GRAPHIC 10

**NUMBER OF BIRTHS IN 1990, BY BORN WEIGHT
AND MOTHER'S RESIDENCE
DEPARTMENT OF CHIMALTENANGO**



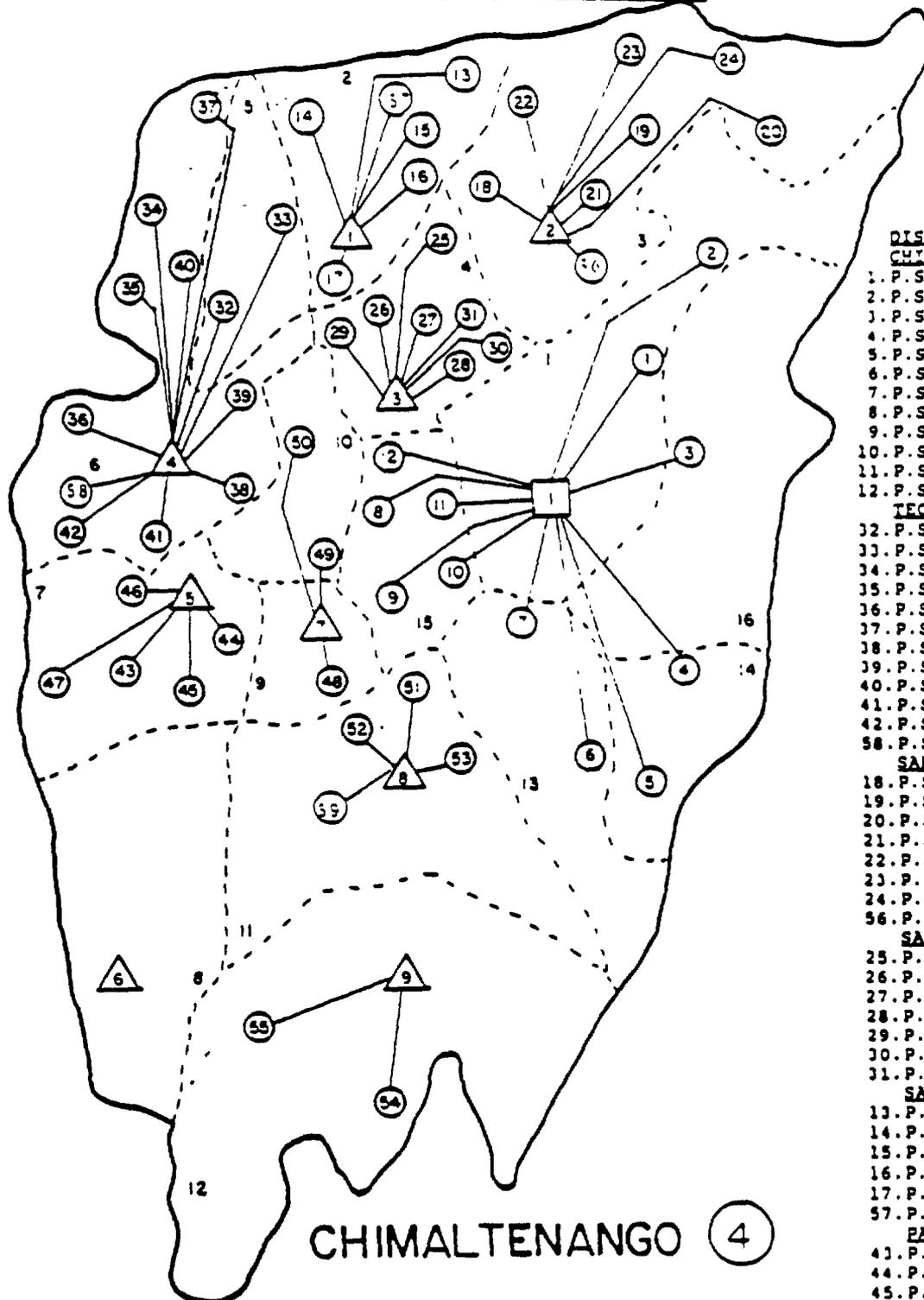
ESTADISTICAS VITALES INE. 1986-1990



**DEPARTAMENTO DE CHIMALTENANGO
CABECERA: CHIMALTENANGO**

- 1 Chimaltenango
- 2 San José Poaquil
- 3 San Martín Jilotepeque
- 4 Comalapa
- 5 Santa Apolonia
- 6 Tecpán Guatemala
- 7 Patsun
- 8 Pochuta
- 9 Patzicía
- 10 Santa Cruz Balanyá
- 11 Acatenango
- 12 Yepocapa
- 13 San Andrés Itzapa
- 14 Parramos
- 15 Zaragoza
- 16 El Tejar





PUESTOS DE SALUD ○

DISTRITOS
CHIMALTENANGO

1. P.S. San Jacinto
2. P.S. Tonajuyu
3. P.S. El Tejar
4. P.S. Parramos
5. P.S. San José Parrojas
6. P.S. Chimachoy
7. P.S. San Andrés Itzapa
8. P.S. Zaragoza
9. P.S. Rincon Grande
10. P.S. Las Lomas Zaragoza
11. P.S. Mancheren Grande
12. P.S. Puerta Abajo

TECPAN C.S.

32. P.S. Santa Apolonia
33. P.S. Chipatá
34. P.S. Caliaj
35. P.S. Caquixajay
36. P.S. Xejavi
37. P.S. Palamá, Tecpan
38. P.S. Xenimajuyu
39. P.S. Chirijuyu
40. P.S. Xecoxol
41. P.S. Agua Escondida
42. P.S. San José Chirijuyu
58. P.S. Pacay

SAN MARTIN JILOTEPEQUE C.S.

18. P.S. Las Lomas P. Sacala
19. P.S. Los Jometes
20. P.S. Chipastor
21. P.S. Chuatalún
22. P.S. Las Escobas
23. P.S. Estancia de la Virge
24. P.S. Estancia de S.M.J.
56. P.S. El Rosario Canajal

SAN JUAN COMALAPA C.S.

25. P.S. Simajhuleu
26. P.S. Patzaj
27. P.S. Paquixic
28. P.S. Paraxaj
29. P.S. Panabajal
30. P.S. Pamumus
31. P.S. Xiquin Sinal

SAN JOSE POAQUIL C.S.

13. P.S. Hacienda María
14. P.S. Palamá Poaquil
15. P.S. Saquitacaj
16. P.S. La Carrucha
17. P.S. Panimacac
57. P.S. Ojercarbal

PATZUN C.S.

43. P.S. San José Xepatan
44. P.S. El Sitio
45. P.S. Xatzán Bajo
46. P.S. Cojobal
47. P.S. Chipiactul

PATZICIA C.S.

48. P.S. Pehuit
49. P.S. Santa Cruz Balanya
50. P.S. Chimasat

ACATEANGO C.S.

51. P.S. San Antonio Nejapa
52. P.S. Quisacha
53. P.S. Los Pajales
59. P.S. El Socorro

YEPOCABA C.S.

54. P.S. C. Agraria Morelia
- San Rafael Sumatan

POC HUA C.S.

- MUNICIPIOS**
1. Chimaltenango
 2. San José Poaquil
 3. San Martín Jilotepeque
 4. San Juan Comalapa
 5. Santa Apolonia
 6. Tecpán Guatemala
 7. Patzún
 8. Pochuta
 9. Patzicía
 10. Santa Cruz Balanyá
 11. Acatenango
 12. Yepocapa
 13. San Andrés Itzapa
 14. Parramos
 15. Zaragoza
 16. El Tejar

- HOSPITALES** □
1. Chimaltenango (Centro Integrado)

- CENTROS DE SALUD** △
1. San José Poanuil
 2. San Martín Jilotepeque
 3. San Juan Comalapa A
 4. Tecpán Guatemala A
 5. Patzún
 6. Pochuta
 7. Patzicía
 8. Acatenango
 9. Yepocapa

CHIMALTENANGO ④

104

VII. DEPARTMENT OF SACATEPEQUEZ

A. SOCIO-DEMOGRAPHIC DESCRIPTION

Sacatepéquez is located in the central region of Guatemala, limiting to the North with the Department of Chimaltenango; to the South with the Department of Escuintla; to the East with the Department of Guatemala; and to the West with the Department of Chimaltenango. (1)

The City of Antigua Guatemala, cabecera departamental, has an altitude of 1,530 meters above sea level, a latitude of 14°33'30", and a longitude of 90°43'50".

This department has an extension of 465 square kilometers. It has 16 municipal divisions (municipios) as follows. See Map 1. (1)

- | | |
|---|--------------------------------------|
| 1. Antigua Guatemala | 10. San Miguel Dueñas (11 kms) |
| 2. Alotenango (10 kms) | 11. Santa Catarina Barahona (11 kms) |
| 3. Ciudad Vieja (5 kms) | 12. Santa Lucía Milpas Altas (8 kms) |
| 4. Jocotenango (2 kms) | 13. Santa María de Jesus (10 kms) |
| 5. Magdalena Milpas Altas (12 kms) | 14. Santiago Sacatepéquez (20 kms) |
| 6. Pastores (4 kms) | 15. Santo Domingo Xenacoj (40 kms) |
| 7. San Antonio Aguas Calientes (10 kms) | 16. Sumpango (8 kms) |
| 8. San Bartolome Milpas Altas (20 kms) | |
| 9. San Lucas Sacatepéquez (19 kms) | |

* In parentheses, distance in kilometers to the cabecera departamental.

Sacatepéquez has a projection of 196,537 inhabitants for 1994. From this population, 74.42% live in the urban area and 25.58% live in the rural area (2).

Graphic No. 1 shows the population pyramid. We can observe in this graphic that the pyramid base is wide and the largest population is concentrated on the infant area.

Migratory movements which could affect the amount of births do not influence seriously the birth rates.

According to the Ministry of Public Health, the infant mortality rate for Sacatepéquez was 45.21 x 1,000 born alive in 1991, and a mortality for illnesses during the perinatal period of 71.44 x 100,000 inhabitants in 1990. This department has a very high perinatal mortality rate, ranking in the fourth place for the country (3).

The maternal mortality rate estimated by the Ministry of Public Health was of 25.6% x 10,000 born alive for 1989, with an under record of 21%. Following are causes reported: hemorrhage 42%, toxemia 7%, sepsis 28%, complications from abortion 7%, others 16%.

Graphic 2 shows maternal deaths by municipio, and the areas with the highest incidence of deaths are Magdalena Milpas Altas, Antigua, San Antonio Aguas Calientes, Alotenango, and Santa María de Jesus. (4)

We can notice that Antigua Guatemala, Zumpango, Ciudad Vieja, Santiago Sacatepéquez, Santa María de Jesus, Alotenango and Jocotenango have higher rates of births. (See Graphic 3) (3).

Considering ranges of age with higher fecundity, we can observe that the group from 15 to 24 years of age has a higher rate or amount

of births born alive. This indicates an early start in procreation, implicating that possibly no contraceptive methods are being used; as well as a lack of education in women. (See Graphic 4.) (3)

We observed a significative variation regarding the amount of births throughout the year with a marked decrease in the month of May, as reported for 1990. (See Graphic 5.) (3)

Considering the marital status of mothers, the amount of births in 1990 was higher for married women, 67.39%; for single women, 22.61%; and for women living with a man without being married, 9.20. (See Graphic 6) (3).

Births by place of delivery were as follows: 73.97% in the house and 26.53% in the hospital. This department has the highest coverage of services within the five departments evaluated. (See Graphic 7.) (3)

In a joint evaluation of the staff in charge of deliveries, we find that in a 68.92%, it was performed by a person with no previous training and in a 28.04% by medical staff. (See Graphic 8.) (3)

We could also observe that low-birth weight has a prevalence of 7.00%, which is considered low in comparison with other departments. (See Graphic 9.) (3)

B. RESOURCES AND STRUCTURE OF THE HEALTH SYSTEM IN THE DEPARTMENT OF SACATEPEQUEZ

As previously mentioned, Sacatepéquez has 16 municipal divisions, and the health system has been divided into 3 districts.

It has two hospitals, the National Hospital Pedro de Bethancourt with a capacity for 212 beds, and the Hogar de Ancianos Fray Rodrigo de la Cruz with a capacity for 110 beds. There are no type "A" health centers, there are 3 type "B" health centers and 17 health posts, with a total of 22 buildings. (See Map 2 for more detail).

Table 1 shows information on services provided by municipio (hospital, health center or post).

The National Hospital Pedro de Bethancourt lacks a budget for maintenance and support services; therefore, it does not work at full capacity (only 63.2% - 131 beds).

Twenty-eight beds are assigned to the Gyneco-Obstetrics Department and 15 cribs to the Pediatrics Department.

As shown in Table 1, this hospital has qualified medical resources in Gyneco-Obstetrics and Pediatrics. Physicians provide attention to in patients and external consultation to out patients.

Table 2 shows the annual production at this hospital: 2,570 deliveries performed per year; from these 649 were cesarean sections (25.25) and 1,921 simple eutotic deliveries. The rate of cesarean sections is high. Also, 431 periosteotomies were performed due to incomplete abortions. Prenatal controls were provided as follows: 774 first consultations and 1,151 follow-ups.

Regarding evaluation of essential services for obstetric

attention, we found them satisfactory. The only item with a low ranking was essential drugs, with an availability of only 73.07% of those necessary. (See Table 3)

We interviewed Dr. Francisco Florial Bermudez Vila, Chief of the Health Area. He indicated he had only been in this position for one week and did not have the epidemiological information we required. However, the Mother-Child Department had earlier sent a letter requesting information for this evaluation.

No recent infant mortality rates can be provided as they were not available in this Area. The Health Area Head is not very well organized.

Dr. Florial seemed interested in this project. However, he did not want to take any decision as he did not know very well the health area he had been assigned to.

The Chief Nurse and the statistician were on vacation. It was impossible to obtain information about the amount of birth attendants by municipio.

We interviewed Mrs. Yolanda de Arrivillaga, Chief nurse at the Hospital Pedro de Bethancourt. She indicated that an intervention at the birth attendants level with participation from the hospital staff would be appropriate, especially in regards to the reference and back reference system. She said she would be willing to cooperate with the MotherCare Project as she was interested in its design.

We also interviewed Dr. Gustavo Palencia, Deputy Director of this hospital. Dr. Jose del Busto, Director, was on vacation.

Dr. Palencia also showed interest in the project. He mentioned

that the hospital already has protocols for the obstetric and neonatal management; however, they were not available.

I think there is not a proper systematization in this protocol. Probably it only has a partial overview of problems in the maternal-child group.

Mr. Lizandro Garcia Rivas, statistician at this hospital, assisted in the collection of information necessary for the project.

C. RECOMMENDATIONS

1. I think that Mothercare should implement the reference-back reference system between birth attendants and hospital physicians. However, there are some administrative problems in the area which could restrain the development of this project. Therefore, the possibility to incorporate this department into the project should be considered at a later date, probably within a year.
2. If protocols for the management of obstetric patients are available at the hospital, it might be appropriate to suggest a revision. Also mechanisms should be found to improve medical attention and detection of high risk pregnancies at this hospital.

TABLE 1

AVAILABLE HUMAN RESOURCES
HOSPITAL NACIONAL PEDRO DE BETHANCOURT

PERSONNEL	AMOUNT	PERCENTAGE
1. Gyneco-Obstetricians	7	7.0
2. Pediatricians	4	4.0
3. Surgeons	6	6.0
4. Internal physicians	4	4.0
5. Anesthesiologists	5	5.0
6. General physicians	20	20.0
7. Chief nurses	12	12.0
8. Auxiliary nurses	42	42.0
9. Registered birth attendants	0	0
TOTAL	100	100.0

TABLE 2

PRODUCTION OF SERVICES
1994

TYPE OF PATIENT	AMOUNT	PERCENTAGE
1. Deliveries	1,921	74.75
2. Cesarean sections	649	25.25
TOTAL	2,570	100.00
3. Periosteotomies	431	
4. Prenatal controls	1,889	

111

TABLA 3

**EVALUATION OF ESSENTIAL ELEMENTS FOR OBSTETRIC ATTENTION
AT THE PRIMARY LEVEL OF REFERENCE
1994**

PARAMETER EVALUATED	PERCENTAGE
Instruments for laparotomy	100
Clothes and other	92.86
Instruments for deliveries	94.11
Instruments for evacuation of the uterus	91.66
Instruments for neonatal resuscitation	100
Equipment for anesthesia	100
Resources for laboratory	100
Blood bank	100
Essential drugs	73.07

TABLE 4

FINAL CONSOLIDATION FOR DECISION MAKING ON THE SELECTION OF MUNICIPALS
FOR A POSSIBLE INTERVENTION BY MOTHERCARE

MUNICIPALS	MATERNAL MORTALITY RATE 1989 X 100,000 BORN ALIVE	BIRTHS 1989 ¹	DISTANCE Kms ²	AMOUNT OF HEALTH POSTS ³
1. Magdalena Milpas Altas	862.07	116	12	1
2. Antigua	722.39	969	-----	0
3. Sn. Antonio Aguas Cal.	485.44	206	10	1
4. Alotenango	225.23	444	10	0
5. Sta. Maria de Jesus	222.72	449	10	1
6. Ciudad Vieja	180.18	555	5	1
7. Santiago Sacatepéquez	170.94	585	20	1
8. Sumpango	152.67	655	8	1
9. Sta. Catarina Barahona	0	68	11	1
10. San Lucas Sac.	0	188	19	1
11. San Miguel Dueñas	0	204	11	1
12. Jocotenango	0	328	2	1
13. Sta. Lucia M.A.	0	166	8	2
14. Sto. Domingo Xenacoj	0	197	40	1
15. Sn. Bartolomé M.A.	0	61	20	1
16. Pastores	0	133	4	3
TOTAL	256.32	5,462		17

¹ Estudio de Mortalidad Materna en Guatemala 1,989. MSPAS/DGSS/Materno Infantil, OPS/OMS/Mother-Care.

² Instituto Geografico de Guatemala.

³ Red de Establecimientos del Ministerio de Salud Publica y Asistencia Social, Unidad de Informatica 1994.

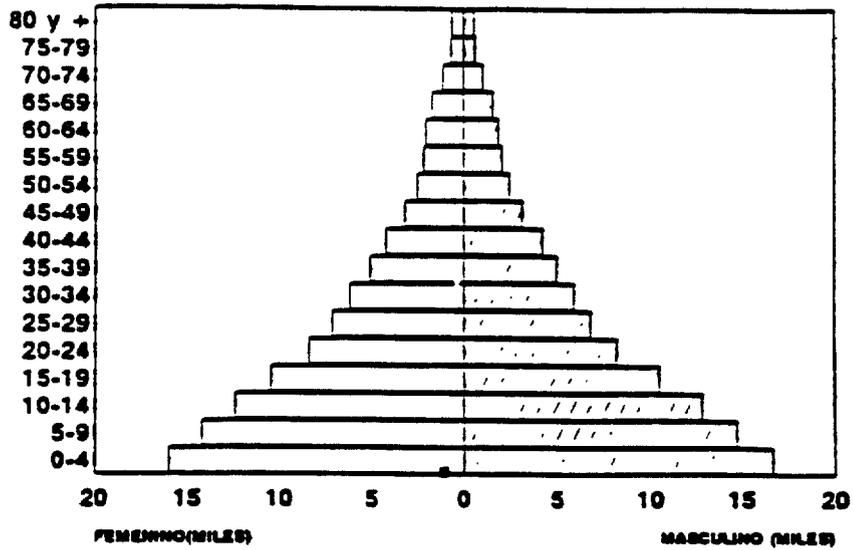
**DEPARTAMENT OF SACATEPEQUEZ
SERVICES BY MUNICIPALS**

MUNICIPAL	HOSPITALS	HEALTH CENTER	HEALTH POST
1. Antigua Guatemala	1. Pedro de Bethancourt 2. Hogar de Ancianos Fray Rodrigo De La Cruz	1. Antigua Guatemala	
2. Jocotenango			1. Jocotenango
3. Pastores			1. Pastores 2. San Luis Pueblo Nuevo 3. San Lorenzo el Tejar
4. Sumpango			1. Sumpango
5. Santo Domingo Xenacoj			1. Santo Domingo Xenacoj
6. Santiago Sacatepéquez		1. Santiago Sacatepéquez	1. Santa María Cauque
7. San Bartolome Milpas Altas			1. San Bartolome Milpas Altas
8. San Lucas Sacatepéquez			1. San Lucas Sacatepéquez
9. Santa Lucia Milpas Altas			1. Santa Lucia Milpas Altas 2. Santo Tomas Milpas Altas
10. Magdalena Milpas Altas			1. Magdalena Milpas Altas
11. Santa María de Jesus			1. Santa María de Jesus
12. Ciudad Vieja			1. Ciudad Vieja
13. San Miguel Dueñas			1. San Miguel Dueñas
14. Alotenango		1. Alotenango	
15. San Antonio Aguas Calientes			1. San Antonio Aguas Calientes
16. Santa Catarina Barahona			1. Santa Catarina Barahona

GRAPHIC 1

**POPULATION PYRAMID OF DEPARTMENT OF SACATEPEQUEZ
BY AGE AND SEX GROUPS
Projections 1994**

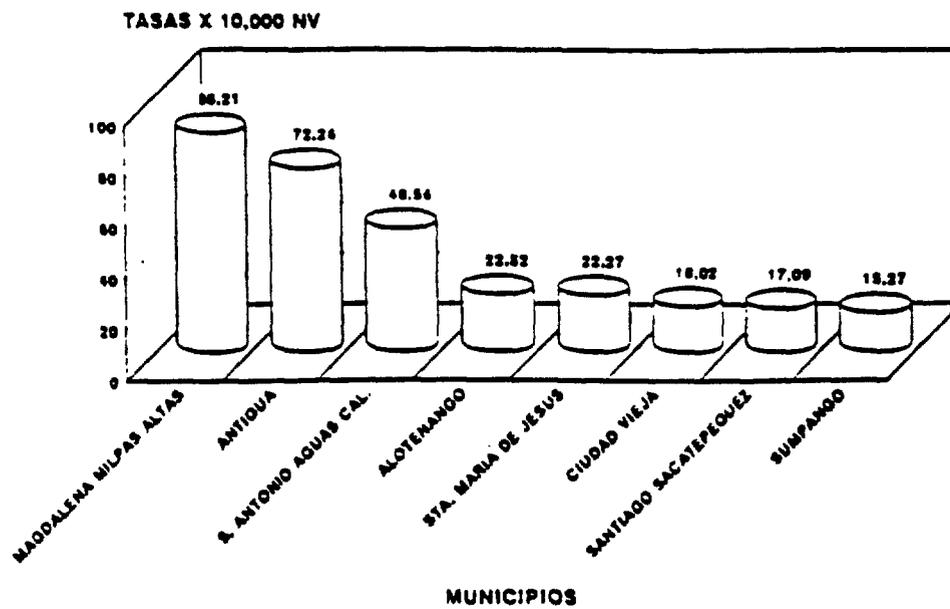
GRUPOS DE EDAD



PROYECCIONES 1980-2000 SEGEPLAN

GRAPHIC 2

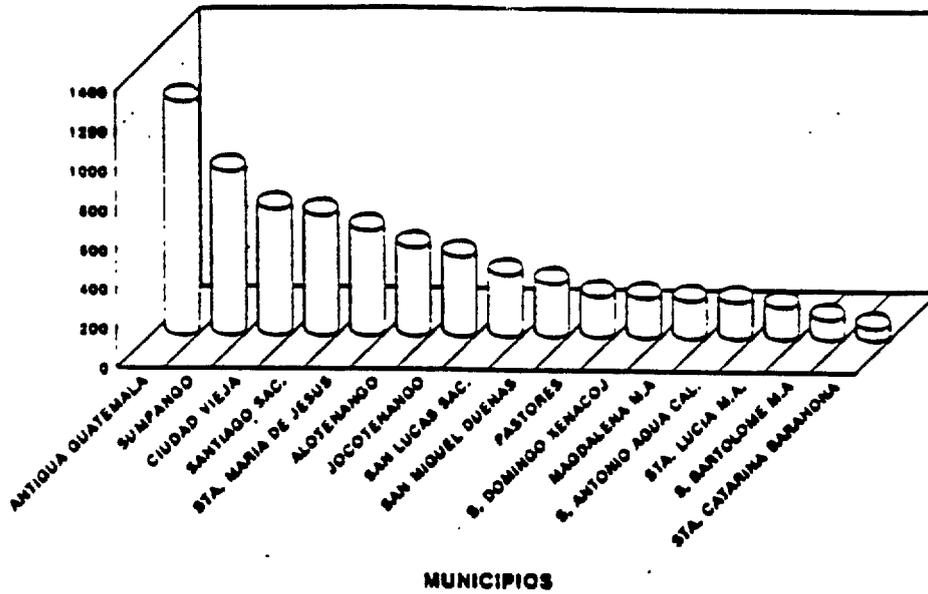
NUMBER OF MOTHER DEATHS IN 1989, BY MUNICIPAL DEPARTMENT OF SACATEPEQUEZ



MSPAS 1989

GRAPHIC 3

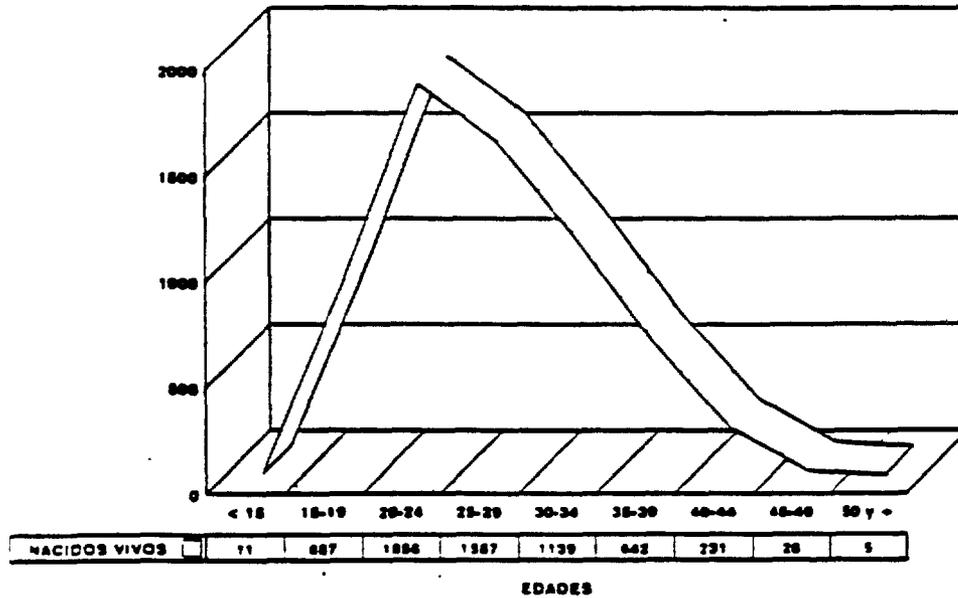
NUMBER OF BIRTHS IN 1990, BY MOTHER'S MUNICIPAL OF RESIDENCE DEPARTMENT OF SACATEPEQUEZ



ESTADISTICAS VITALES INE. 1986-1990

GRAPHIC 4

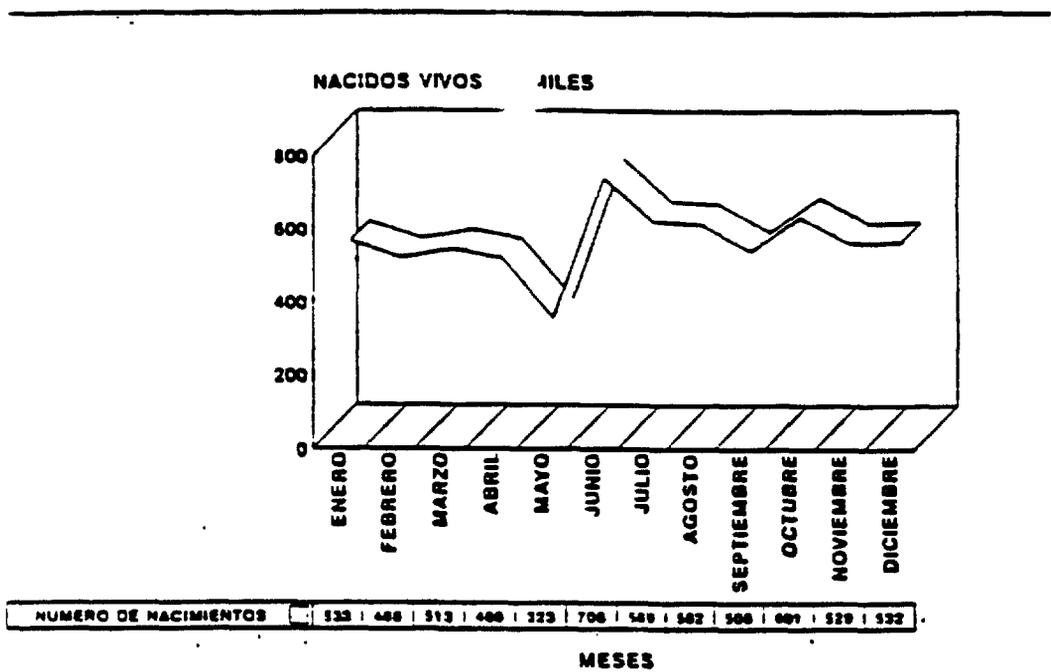
**NUMBER OF BIRTHS IN 1990, BY MOTHER AGE
DEPARTMENT OF SACATEPEQUEZ**



ESTADISTICAS VITALES INE, 1990-1990

GRAPHIC 5

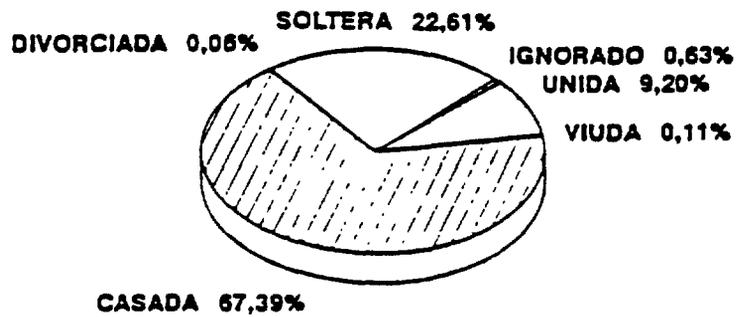
**BORN ALIVE IN 1990
DEPARTMENT OF SACATEPEQUEZ
VARIATION THROUGH MONTHS OF THE YEAR**



ESTADISTICAS VITALES INE, 1986-1990

GRAPHIC 6

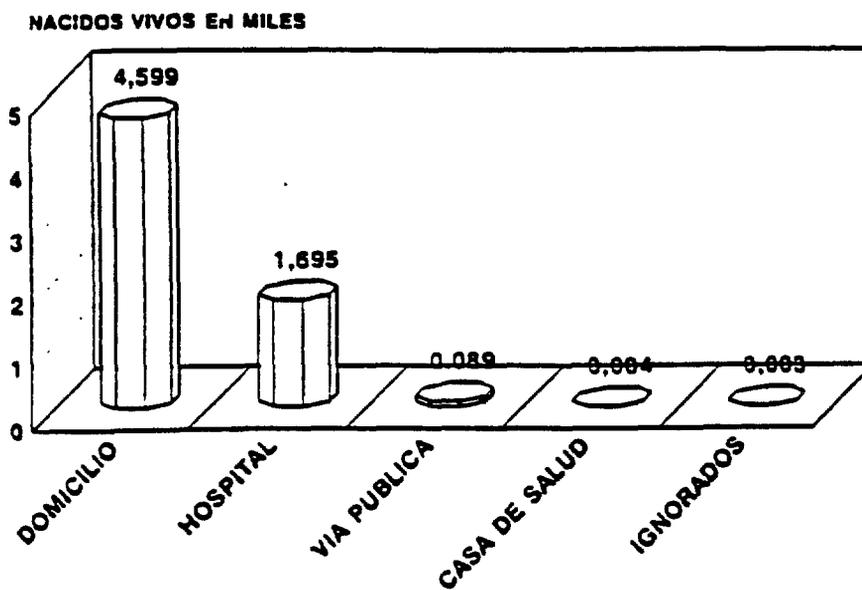
**NUMBER OF BIRTHS IN 1990, BY MOTHER CIVIL STATUS
DEPARTMENT OF SACATEPEQUEZ**



ESTADISTICAS VITALES INE, 1986-1990

GRAPHIC 7

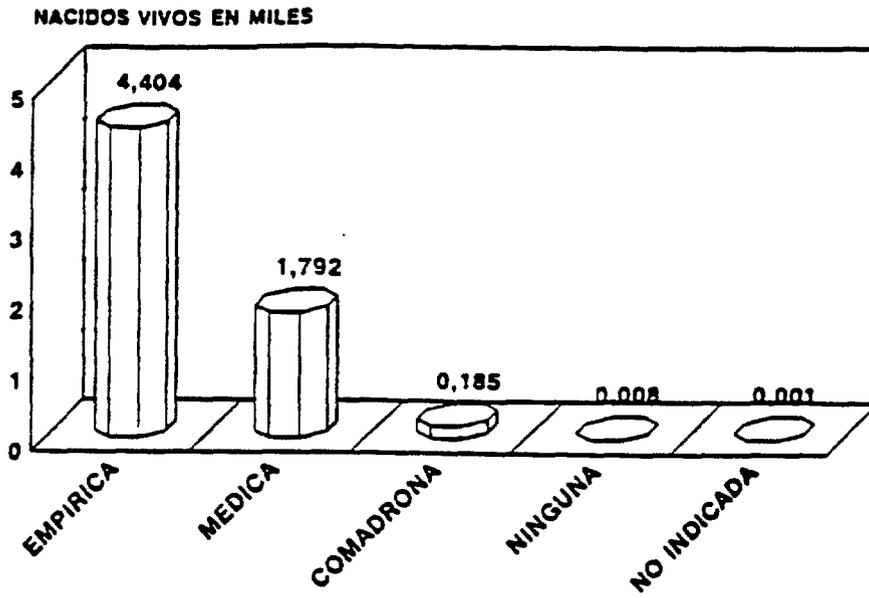
**NUMBER OF BIRTHS IN 1990,
BY WHERE THE DELIVERIES TOOK PLACE
DEPARTMENT OF SACATEPEQUEZ**



ESTADISTICAS VITALES INE, 1988-1990

GRAPHIC 8

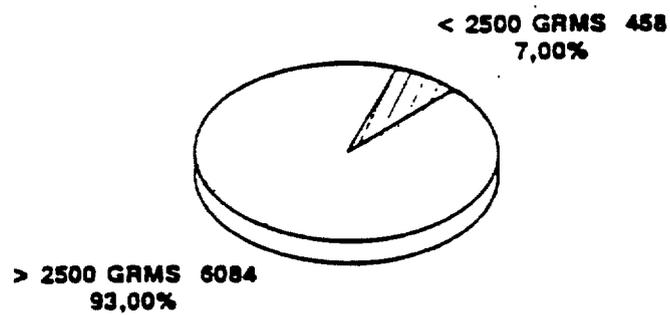
**NUMBER OF BIRTHS IN 1990, BY MOTHER'S RESIDENCE
DEPARTMENT OF SACATEPEQUEZ**



ESTADISTICAS VITALES INE, 1990-1990

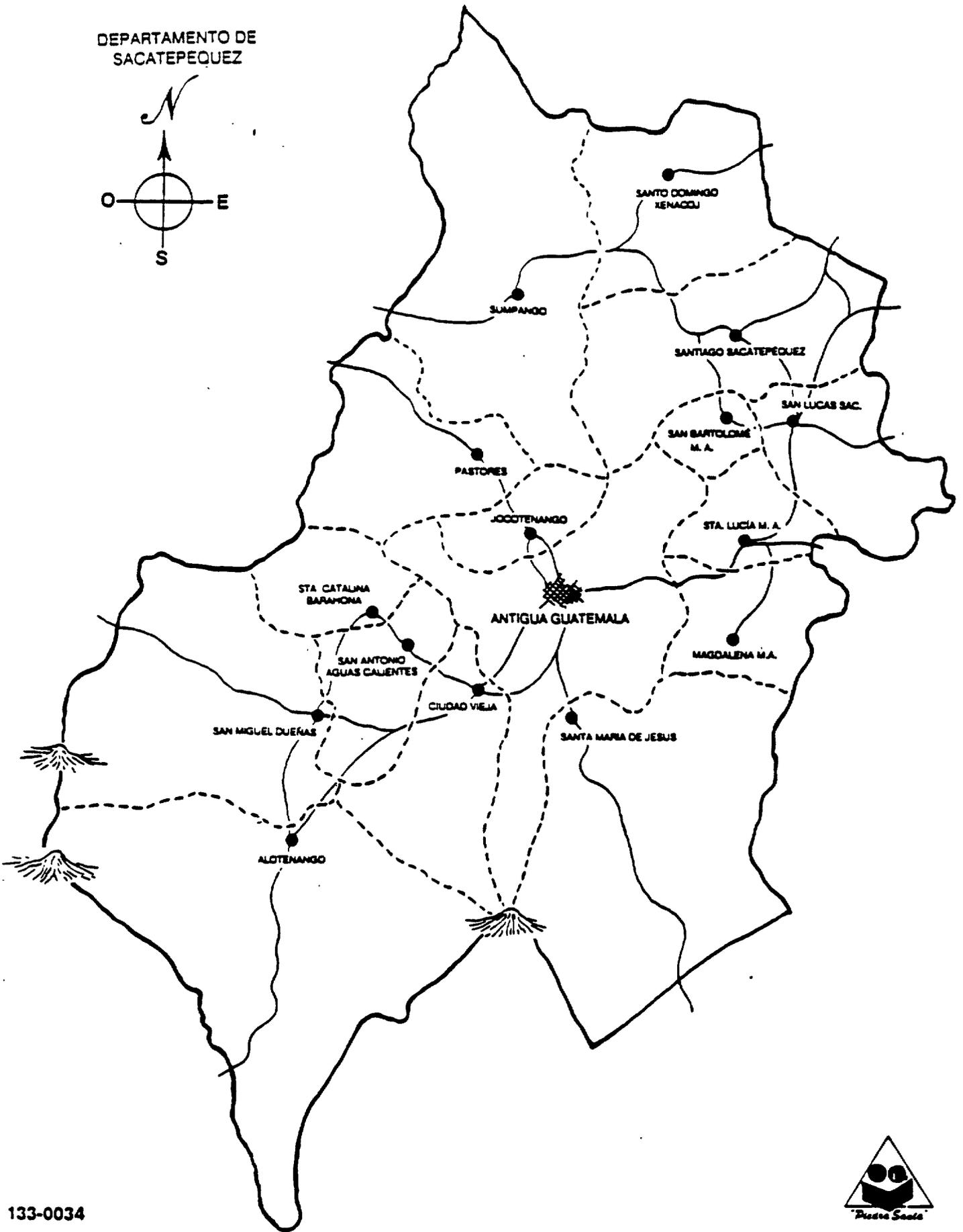
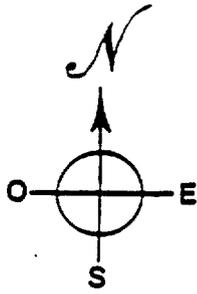
GRAPHIC 9

**NUMBER OF BIRTHS IN 1990, BY BORN WEIGHT
AND MOTHER'S RESIDENCE
DEPARTMENT OF SACATEPEQUEZ**



ESTADISTICAS VITALES INE. 1986-1990

DEPARTAMENTO DE SACATEPEQUEZ

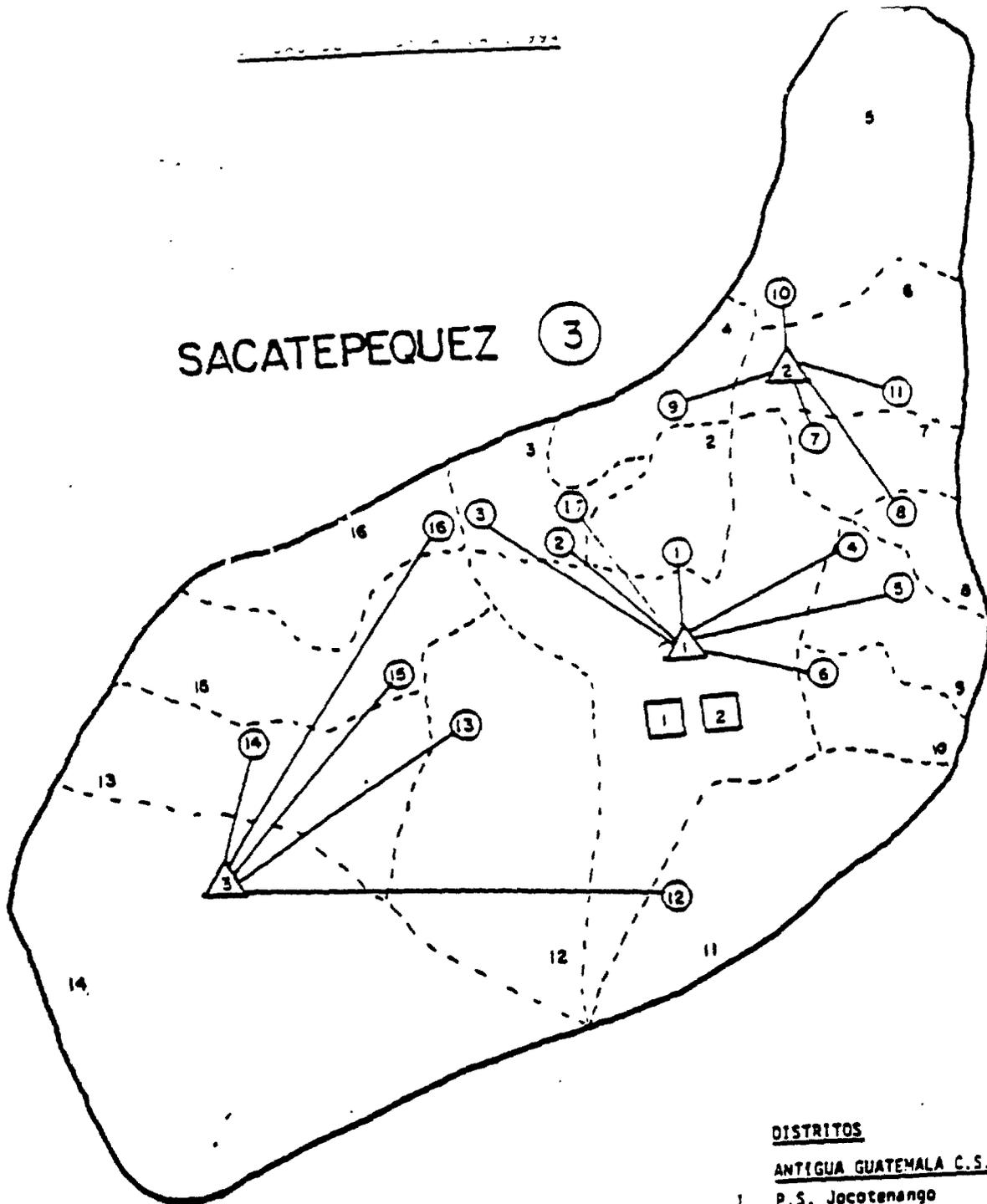


133-0034



SACATEPEQUEZ

3



MUNICIPIOS

1. Antigua Guatemala
2. Jocotenango
3. Pastores
4. Sumpango
5. Santo Domingo Xenacoj
6. Santiago Sacatepéquez
7. San Bartolomé Milpas Altas
8. San Lucas Sacatepéquez
9. Santa Lucía Milpas Altas
10. Magdalena Milpas Altas
11. Santa María de Jesús
12. Ciudad Vieja
13. San Miguel Dueñas
14. Alotenango
15. San Antonio Aguas Calientes
16. Santa Catarina Barahona

HOSPITALES

1. "Pedro de Bethancourt"
2. Hogar Ancianos (Fray Rodrigo de la Cruz)

CENTROS DE SALUD

1. Antigua Guatemala
2. Santiago Sacatepéquez
3. Alotenango

PUESTOS DE SALUD

DISTRITOS

ANTIGUA GUATEMALA C.S.

1. P.S. Jocotenango
2. P.S. Pastores
3. P.S. San Luis Pueblo Nuevo
4. P.S. Santa Lucía Milpas Altas
5. P.S. Santo Tomás Milpas Altas
6. P.S. Magdalena Milpas Altas

SANTIAGO SACATEPEQUEZ C.S.

7. P.S. San Bartolomé Milpas Altas
 8. P.S. San Lucas Sacatepéquez
 9. P.S. Sumpango
 10. P.S. Santo Domingo Xenacoj
 11. P.S. Santa María Cauqué
 12. P.S. San Lorenzo El Tejar
- ### ALOTENANGO C.S.
13. P.S. Santa María de Jesús
 14. P.S. Ciudad Vieja
 15. P.S. San Miguel Dueñas
 16. P.S. San Antonio Aguas Calientes
 17. P.S. Santa Catarina Barahona

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IX. ANNEXES

SURVEY FOR HEALTH PERSONNEL ON ATTITUDES AND TRAINING
RECEIVED IN THE MOTHER-CHILD ATTENTION
MOTHERCARE/USAID/MSPA

- 1) Book No.: 2) Date:
(day month year)
- 3) Name: _____
- 4) Age:
Sex: 1. Masculine
 2. Feminine
- 5) Place of work: _____
- 6) Position:
1. Physician
2. Graduate nurse
3. Auxiliary nurse
4. Other _____
- 7) Years working in the health sector?
- 8) Do you receive training in the mother-child attention from the Ministry of Public Health or from the institution you work for?
1. Yes
2. No
- If your answer was no, please go to question No. 9.
- 9) How many training courses do you receive every year in the mother-child attention? Specify amount.
- 10) Do you think it would be appropriate to strengthen knowledge in this area to improve the quality of attention?
1. Yes
2. No
- 11) Would you be willing to receive continued education and training from specialists?
1. Yes
2. No
- 12) If your answer was yes, specify areas of interest:
1. Prenatal attention
2. Attention for deliveries
3. Attention for newborns
4. All previous areas
5. Other _____

- 13) Would you participate in the implementation of a mother-child program to improve quality of attention and utilization of services?
1. Yes
 2. No
- 14) Do you think infant and maternal mortality is a priority problem in the health sector?
1. Yes
 2. No
- 15) Do you think that train birth attendants are a proper resource to improve the coverage of attention for deliveries in the health sector?
1. Yes
 2. No
- 16) If your answer was no, specify reason:
-
-
- 17) Do you think a proper communication channel could be established between birth attendants and health sector institutions, through the reference-back reference system?
1. Yes
 2. No

EVALUATION OF ESSENTIAL ELEMENTS FOR OBSTETRIC ATTENTION
AT THE PRIMARY LEVEL OF REFERENCE
(AS RECOMMENDED BY WHO)
MOTHERCARE/USAID/MSPA

- 1) Book No.: 2) Date:
(day month year)
- 3) Name of institution: _____
- 4) Type of institution:
1. Hospital
2. Type "A" health center
3. Other _____
- 5) Time of existence of physical area:

years months
- 6) Amount of deliveries per year:
- 7) Amount of cesarean sections per year:
- 8) Amount of periosteotomies per year:
- 9) Amount of prenatal controls per year:
- 10) Medical staff:
- 11) Amount of obstetricians:
- 12) Amount of pediatricians:
- 13) Amount of surgeons:
- 14) Amount of internal physicians:
- 15) Amount of general physicians:

- 16) Paramedical staff:
[] []
- 17) Amount of birth attendants registered at the center:
[] []
- 18) Total amount of beds:
[] []
- 19) Amount of beds assigned for post-partum and post-cesarean:
[] []
- 20) Amount of cribs available:
[] []

INSTRUMENTS FOR LAPAROTOMY

CLOTHES AND OTHER ITEMS FOR LAPAROTOMY

INSTRUMENTS FOR THE ATTENTION OF DELIVERIES

INSTRUMENTS FOR EVACUATION OF THE UTERUS

INSTRUMENTS FOR NEONATAL RESUSCITATION

EQUIPMENT FOR ANESTHESIA

RESOURCES FOR LABORATORY

BLOOD BANK

ESSENTIAL DRUGS