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Averting maternal death and disability

FIGO Save the Mothers Initiative: the Central America and USA collaboration

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Abstract

The American College of Obstetricians and Gynecologists (ACOG) and the Central American Federation of Associations and Societies of Obstetrics and Gynecology (FECASOG), as a part of the FIGO Save the Mothers Initiative, undertook a pilot project to improve provision of basic emergency obstetric care in selected departments in four Central American countries. This article describes the process of the development and implementation of the project. Preliminary results suggest that the capacity to provide this care has been improved by the training of healthcare personnel.

Keywords: Maternal mortality; Maternal morbidity; Emergency obstetric care; Obstetric need; Central America; Guatemala; Honduras; Nicaragua; El Salvador

1. Introduction

Maternal mortality continues to be the human development indicator with the greatest gap between developing and developed countries. Approximately 600 000 women die each year as a result of complications of pregnancy and childbirth, with 95% of deaths occurring in the developing world [1]. The maternal mortality ratio in the United States is 7 per 100 000 live births. This translates to a lifetime risk of death from complications of pregnancy and childbirth for women in the U.S. of 1 in 3500 [2]. In the Central American nations of Guatemala, El Salvador, Honduras and

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Nicaragua maternal mortality ratios are 20-fold higher, approximately 200 per 100 000. The lifetime risk of pregnancy related death for Central American women is 1 in 65 to 1 in 100 [3]. The American College of Obstetrics and Gynecology (ACOG) was paired with the Central American Federation of Associations and Societies of Obstetrics and Gynecology (FECASOG) in the FIGO Save the Mothers Initiative [4]. Due to the social, educational, medical and reproductive health similarities between Nicaragua, El Salvador, Guatemala, and Honduras, ACOG elected to work in these countries which have the highest maternal mortality ratios of the six countries in the region.

Research in the 1960s and 1970s revealed that the death of a reproductive age woman significantly lowers the chances of survival of her infants and children, especially female or ill children. It also creates orphans, causes multigenerational family distress, and affects the economic well being of communities. One important lesson of this earlier research was that ensuring the survival of mothers is a crucial for ensuring child survival.

The United Nations Safe Motherhood Initiative, which began in 1987, had the goal of reducing maternal mortality by half in the developing world by the year 2000. A focus on traditional birth attendants failed to show any impact, as most obstetric emergencies which result in maternal death require the skill of trained medical personnel to provide timely life-saving interventions. Sadly, maternal mortality ratios actually increased in many areas since 1987 as economic crises and armed conflicts prevented improvements in care [5].

The obstetric complications that contribute most to maternal deaths in the developing world are hemorrhage, sepsis, eclampsia, obstructed labor and unsafe abortion. The majority of these deaths are preventable. Indeed, the timely provision of cesarean section, blood transfusion, oxytocin and antibiotic therapy and timely management of preeclampsia/eclampsia is believed to be sufficient to reduce maternal mortality rates to 50 per 100 000 without the need for advanced technology and life support mechanisms. For example, during the 1990s in the Goma Refugee Camp in Zaire, timely provision of obstetric care resulted in maternal mortality ratios of 50 per 100 000 live births, compared with ratios of 600 per 100 000 in the population living in surrounding communities [6].

Although maternal mortality results from a complex interplay of cultural, socioeconomic and political issues, much can be done to reduce the number of deaths by focusing on the timely provision of emergency obstetric care. It is important to focus on the three key groups that can effect change. First, obstetricians and gynecologists in the developing world and their professional societies can have an important role in improving the quality of the medical curriculum and training in emergency obstetric care for a variety of health providers. Second, public health specialists within Ministries of Health are key in providing creative solutions to improve access and reorganize the delivery of obstetric care. Finally, members of communities also play a key role in educating and mobilizing their populations to advocate for improved care and to participate in problem solving.

2. The Central America–USA Collaboration

The main objectives of this report are to:

- Describe specific needs in Central America that warranted intervention in order to reduce maternal mortality.
- Describe interventions implemented to address those needs.
- Summarize what was learned and make recommendations for future interventions.

2.1. Description

One rural department was selected in each one of the four countries: Solalá in Guatemala, Sonsonate in El Salvador, Copán in Honduras, and Matagalpa in Nicaragua. The demographic characteristics of these departments are shown in Table 1. The project was coordinated by a representative of the Federation of Central American Societies of Ob/Gyn (FECASOG) and a representative of ACOG. A working team was established in each of the four departments in the selected countries.

In each country, the working teams consist of the following:

a. a representative of the National Ob/Gyn Society who serves as the national coordinator;
b. a field coordinator responsible for the day-to-day workings of the project in the department;
c. two field workers responsible for the collection of data related to maternal deaths in the department; and
d. a local representative from the ministry of health.

The teams worked closely with national representatives of the ministries of health as well as with hospital and community leaders in each department.

2.2. Needs assessment

A needs assessment of participating countries was conducted during the first phase of this project. The conclusions of this assessment determined that:

a. high maternal mortality ratios are a common medical, social, as well as human problem for all countries;
b. there is little reliable information in Central American countries related to maternal mortality;
c. there is a lack of adequately trained healthcare personnel capable of managing obstetric emergencies in public hospitals and at health centers and offices;
d. communication between health centers and regional hospitals is deficient; and
e. there is an underdeveloped relationship between the National Ob/Gyn Societies and the Ministries of Health which resulted in a lack of focus and partnership in dealing with maternal mortality.

Every health facility in each department was evaluated to determine the level of obstetric care currently offered. None of the primary level health facilities (health centers) currently offered the six basic obstetric functions recommended by the UN for primary level health facilities [7]. In addition, barriers to implementing these basic obstetric functions were documented. As deficiencies in basic obstetric functions are widespread in each department, facilities are in urgent need of upgrading.

Table 2 summarizes basic and comprehensive emergency obstetric care levels as recommended by the UN. Table 3 summarizes the actual situation in terms of level of care, as it exists in the four departments of the project. It is evident that the capacity to render basic care for obstetric emergencies did not exist in the four departments. At first glance, it would seem that the actual situation for comprehensive obstetric coverage meets the

Table 2
Basic and comprehensive emergency obstetric care levels

Obstetrical care		Interventions
Comprehensive	8	Cesarean
	7	Blood transfusion
Basic	6	Assisted vaginal delivery
	5	Manual extraction of the placenta
	4	Extraction of residual placenta
	3	Administration of antibiotics
	2	Administration of oxytocin
	1	Administration of anticonvulsive drugs

Table 1
Main geographic and demographic characteristics of selected Central American area departments, and their available health facilities, 1998.

	Sololá, Guatemala	Sonsonate, El Salvador	Copán, Honduras	Matagalpa, Nicaragua
Geographic area (square km)	1061	1225	3203	11 552
Total population	299 005	429 143	290 514	507 782
Municipalities	19	16	23	15
Live births	11 350	13 303	10 168	9351
Regional hospitals	1	1	1	1
Health centers	10	19	13	17

Table 3
Number of institutions that offer basic (BEmOC) and comprehensive (CEmOC) emergency obstetric care in selected Central American countries, 2000 (recommendations by the UN [7])

Department, country	Recommended number of institutions providing BEmOC per 500 000 inhabitants	Actual number	Recommended number of institutions providing CEmOC per 500 000 inhabitants	Actual number
Sololá, Guatemala	3	0	1	2
Sonsonate, El Salvador	4	0	1	2
Santa Rosa de Copán, Honduras	3	0	1	2
Matagalpa, Nicaragua	4	0	1	2

UN standard, which is performing cesareans and blood transfusions in addition to the six basic emergency obstetric functions. Unfortunately, almost all of the institutions providing comprehensive emergency obstetric care are located in urban areas and are private facilities. As a result, the indigent population—the majority of the rural population—has limited access.

2.3. Objectives

The project aimed to define the way in which healthcare services that offer obstetric care in one department in each of the four countries could be better organized with available resources to efficiently manage early detection, referral and management of the complications that compromise a woman's life during pregnancy and childbirth.

The objectives of the collaboration centered around assessing and improving emergency obstetric care at the different health care levels in the selected departments. The initiative had the following components:

a. Determine how emergency obstetric care functions at different healthcare levels in the selected departments and improve that care at health facilities that provided obstetric care.
b. Implement the use of the UN process indicators for emergency obstetric care to evaluate the impact of project interventions.
c. Develop an epidemiologic monitoring system for maternal mortality in the selected departments of each of the countries and improve the system of maternal mortality data collection.
d. Foster the development of maternal mortality committees at the community and district hospital levels.
e. Improve the relationship between Ob/Gyn Societies and Ministries of Health in each country to give a higher priority to maternal health.
f. Bolster the National Ob/Gyn Societies in becoming active partners with their Ministries of Health in providing improved health care to women.

2.4. Interventions

Based on the results of the needs assessment the following interventions were implemented.

a. Training. Field coordinators in each selected department were trained in the management of emergency obstetric care intended to save the lives of pregnant women with complications. An Instructor's Manual and a Course Manual with Updates in Obstetric Emergency Care were developed [8]. The first manual describes teaching methodologies directed at adult learning and course methodology; the second manual includes modules about the treatment of obstetric emergencies, post-partum hemorrhage, post-partum infections, post-partum or post-abortion septic shock, disseminated intravascular coagulation during pregnancy, as well as severe pre-eclampsia and eclampsia. Each field coordinator selected six professionals in the most needy

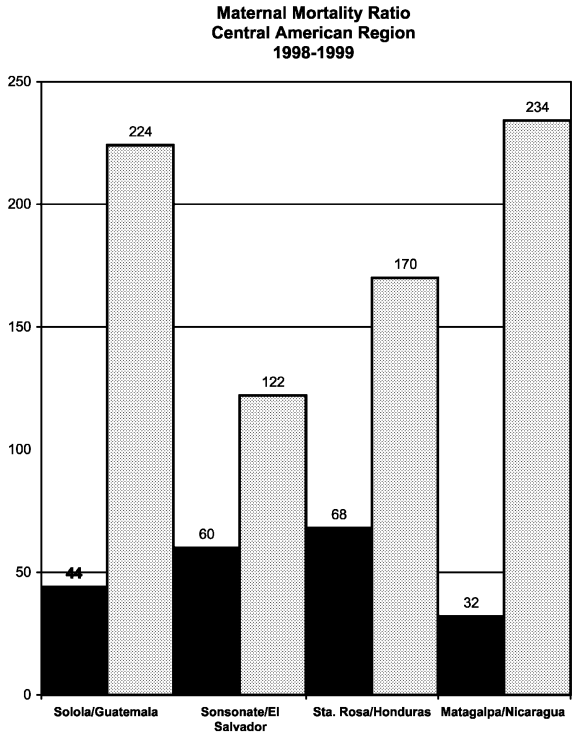

Fig. 1. The first bar for each country is the government reported ratio; the second is the ratio found by the project.

municipalities within the department, which include obstetrics and gynecology specialist, general practitioners and nurses. During a 4-week period the coordinator provided theoretical and practical training to the staff. These trainees, after finishing the course, shared the acquired knowledge with the remainder of the staff of the entire district. The expectations upon completion were to have all health care personnel for each department trained in the management of obstetric emergencies. Also, emergency obstetric care refresher courses were programmed.

b. Revised protocols. (i) Active management with oxytocin during the third period of labor was introduced routinely in all the institutions providing childbirth services. (ii) Health providers were trained in the procedure of manual endometrial aspiration for treating incomplete abortions.
c. A prospective and systematic data gathering system was established in all four departments. This system made it possible to detect all deaths among women of reproductive age within the selected department, and from those, all maternal deaths. All maternal deaths, whether they occurred in an institution or at home, were studied in detail. As part of the data gathering, verbal autopsies were performed. These interviews with family and community members provided much more reliable information about each death than the official records. This made it possible to determine a more realistic maternal mortality ratio for each one of the departments and to obtain information that would make it possible to evaluate the impact of the project.
d. Maternal mortality committees were created or reinforced in each department. These committees analyzed each of the maternal deaths that occurred. The objective was to understand both the clinical causes and the socioeconomic fac-

Table 4
Direct obstetric causes for maternal deaths by place of delivery Guatemala, El Salvador, Honduras, and Nicaragua January–December 1999

	Home *N*	Hospital *N*	Transit *N*	Died pregnant *N*	Total
Hemorrhage	24	3	3	3	33
Infection	12	4	–	2	18
PIH[a]	2	2	1	1	6
Other	2	–	2	–	4
TOTAL direct	40 (66%)	9 (15%)	6 (9.5%)	6 (9.5%)	61
Indirect	6	6	2	3	17

[a] One case unknown place of delivery.

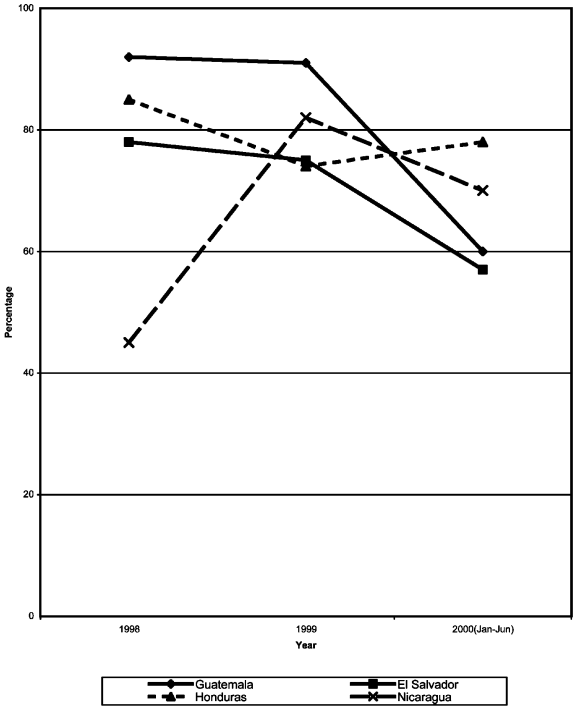

Fig. 2. Unmet need (the percentage of women with complications who do not seek treatment in EmOC facilities), Central America.

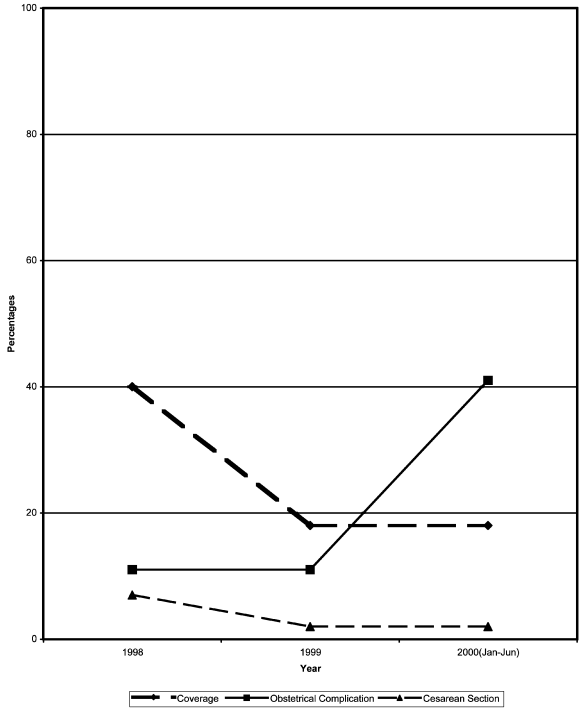

Fig. 3. Trends in UN Process indicators, Sonsonate, El Salvador 1998–2000.

tors related to the death so that similar situations could be anticipated in the future and thus avoided.

e. Radiotelephones were installed to facilitate communications between health centers and regional hospitals.
f. Evaluation meetings were held quarterly with local health authorities. Informational meetings were held with national health authorities and Ob/Gyn Societies at least once during the 2 years of the project.

2.5. Results

Table 1 shows the main geographic and demographic characteristics, and the availability of medical institutions within the selected departments for each Central American country from January 1 to December 31, 1998. Matagalpa, Nicaragua, represents the department with the largest geographic area, whereas Sololá, Guatemala has the smallest. Likewise, Matagalpa has the largest population, the smallest number of municipalities but, interestingly, the smallest number of births.

To demonstrate a decrease in maternal mortality as a result of the project would require continued interventions for 5–6 years. Thus, as expected, we have not observed a significant decrease in the maternal deaths in the four departments. Furthermore, as a result of the improved surveillance system more maternal deaths are being identified (see Fig. 1) so that data obtained during the interventions cannot be compared with previous data.

Table 4 shows that 60% of *all* maternal deaths (both direct and indirect) occur following delivery at home. This cultural pattern of household deliveries presents a formidable constraint if maternal mortality is to be decreased.

Fig. 2 shows the unmet need for emergency obstetric care (the percentage of patients with

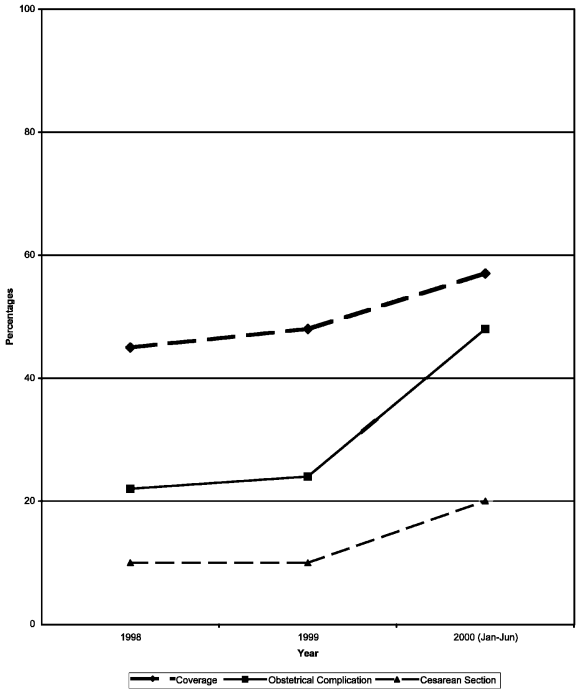

Fig. 4. Trends in UN process indicators, Copán, Honduras 1998–2000.

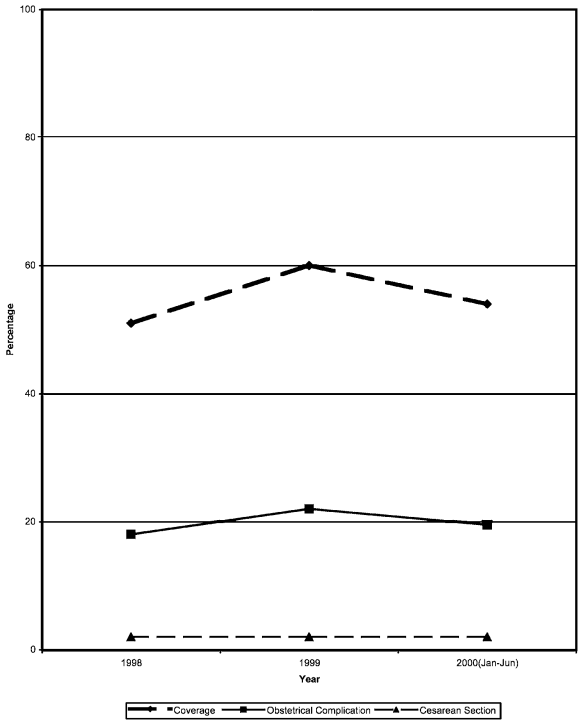

Fig. 5. Trends in UN process indicators, Sololá, Guatemala 1998–2000.

obstetric emergencies who should have accessed care but did not receive it) using the project data for 1999 and 2000. There is a slight decrease from 80% to approximately 70% overall. We attribute the relatively low figure for Nicaragua in 1998 to underreporting of complications by hospitals.

Figs. 3–6 show some process indicators in the four regions of the project. The data for 1998 and 1999 are from official government statistics while the 2000 data are from the project collected statistics. Data from 2001 and 2002 are still being analyzed although the figures suggest improvement in the percentage of patients with obstetric complications who are seen in the health centers of the departments (coverage). There also appears to be a slight increase in cesarean sections, however, the numbers are too small for valid conclusions to be drawn.

Tables 5 and 6 show the trend in obstetric and gynecologic visits to and maternal deaths for the regional hospital of Copán, Honduras. As the Regional Hospital in Copán is the only one in the region it is reasonable to assume that these figures are representative of the department. Based on these percentages it appears that the number of obstetric related visits and maternal deaths have improved, however, the numbers are too small for definite conclusions.

The training component of the project reached almost all health care providers in the four departments. Table 7 summarizes the number of personnel trained in obstetric emergency care. The number of follow-up trainings done in Honduras has not been confirmed. Most health care facilities in each of the four departments still do not provide all six of the signal functions. Also, in one municipality in the department of Copán in Honduras a new clinic has been established through the efforts of this project. Unfortunately the UN standard of four centers providing basic emergency obstetric care per 500 000 inhabitants remains unattainable. Also, basic care is available 24 h a day in only one municipality in the department of Sonsonate,

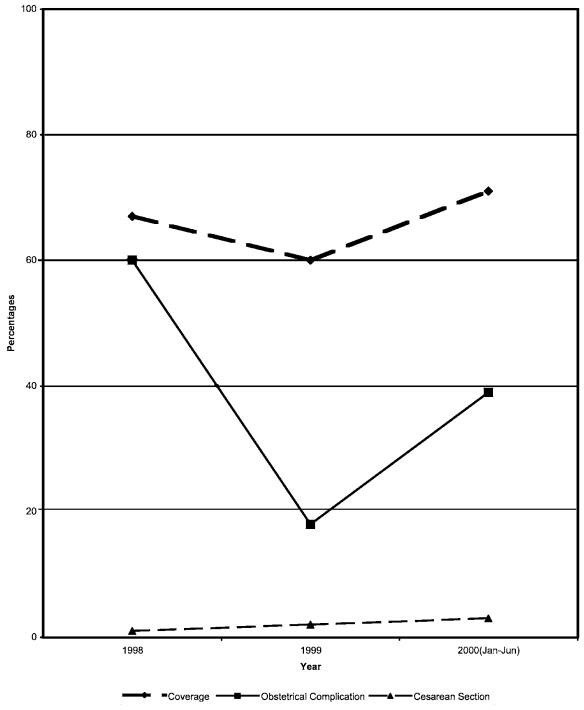

Fig. 6. Trends in UN process indicators, Matagalpa, Nicaragua 1998–2000

El Salvador where 24-h care is provided by nurse midwives.

3. Conclusions

The cost of this pilot project was approximately $200 000 per year suggesting that improving emergency obstetric care may be a relatively inexpensive approach to reducing maternal mortality in the four Central American countries where FIGO's Save the Mothers Initiative was implemented. The project would need to be replicated in other departments in the four countries and be maintained for at least five more years to clearly demonstrate a significant decrease in mortality. A cost analysis should be part of such projects.

Table 5
Hospital visits to the only hospital in the department of Copán, Honduras 1998–2000

Year	Number of hospital Ob/Gyn visits
1998	13 337
1999	16 158
2000	17 143

Table 6
Direct maternal deaths per 100,000 deliveries in the only hospital in Copán, Honduras

Year	
1998	191
1999	152
2000	106

One objective clearly achieved has been the collection of more reliable data on maternal mortality than was previously available. This achievement has alerted the Ministries of Health to the real magnitude of the problem and has resulted in their giving a higher priority to maternal mortality as a national problem. Their commitment to continue with the programs on maternal surveillance, health provider education, upgrading and where possible building facilities providing emergency obstetric care, and providing essential medications should lead to safer motherhood.

In a project like this there are many lessons to be learned. We consider the most crucial to be:

1. For any significant changes to occur both the National Association of Ob/Gyn and the Ministries of Health must embrace the project, give it top priority and work hand in hand with the project personnel. Much time was wasted solving small daily problems, which could have been dealt with at a national level. We recommend that there should be two national coordinators, one representing the National Association of Obstetrics and Gynecology and

Table 7
Personnel trained in emergency obstetric care

Country	Health professionals trained	
	First training	Follow-up training
Guatemala	140	68
El Salvador	307	307
Honduras	154	0
Nicaragua	328	127
Total	929	502

one representing the Ministry of Health. Likewise, the field coordinator must work closely with the local Ministry of Health administrator.
2. The National Obstetric societies do not appear to be motivated to take the lead in addressing the problem of high maternal mortality. The societies must identify areas where they can intervene like advocacy and lobbying. They could also do the following: (i) write, circulate and promote treatment protocols; (ii) improve the interpersonal skills of medical staff towards patients; (iii) improve accountability; and (iv) Improve medical education with regard to social obstetrics. In addition to the national coordinator, an advisory board made up of representatives from the Ministries of Health, the National Association, women's groups, etc., should be created.
3. There are few resources in the communities to achieve the objectives set up by the project.
4. Time and effort should be spent to promote the formation of women's groups with emphasis on education about issues related to women's health.
5. The governments have limited budgets and therefore continuity of the project has been a difficult issue. From the beginning, it is important that key government individuals become involved so that they are aware of, and identify with, the long range goals and objectives.

It is necessary to bridge the gap between medical and sociopolitical realms around maternal mortality. The national Ob/Gyn societies, women's groups, and others must use policy formulation, advocacy and social marketing strategies to promote awareness and action. It is important to bolster the Central American Ob/Gyn Societies in becoming active partners with their Ministries of Health in providing improved women's health care, especially obstetric care.

Our data clearly show that any attempt at decreasing maternal mortality must address the issue of home deliveries. These are the result of culture and tradition and will require an intensive effort to modify women's view of deliveries and understanding of the risks involved in home deliveries in their communities. An extensive community education and social marketing program is a must. Likewise, legislative advocacy is necessary to assure implementation of improvements that promote and facilitate efforts at institutional deliveries. The Central American Ministries of Health and Ob/Gyn Societies must make maternal mortality a top priority and advocate for laws favorable to safe motherhood. Given the limited financial resources in these countries it is imperative that FIGO's and ACOG's efforts be sustained and expanded into other areas of Central America.

Acknowledgments

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