

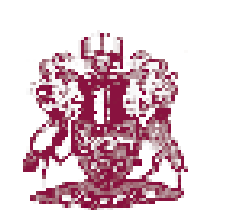
# SAFE MOTHERHOOD DEMONSTRATION PROJECT WESTERN PROVINCE

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*Approaches to providing quality  
maternal care in Kenya*



Republic of Kenya  
Ministry of Health



University of Nairobi



**SAFE MOTHERHOOD  
DEMONSTRATION PROJECT  
WESTERN PROVINCE**

**FINAL REPORT**

**Population Council  
Charlotte Warren  
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December 2004



The Population Council is an international, nonprofit, nongovernmental institution that seeks to improve the well-being and reproductive health of current and future generations around the world and to help achieve a humane, equitable, and sustainable balance between people and resources. The Council conducts biomedical, social science, and public health research and helps build research capacities in developing countries. Established in 1952, The Council is governed by an international board of trustees. Its New York headquarters supports global network of regional and country offices.

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## FOREWORD

The Ministry of Health has been piloting Safe Motherhood (SM) activities in Western Province since 2000 by developing approaches to reducing maternal and neonatal morbidity and mortality. The overall goal of the project was to improve maternal health in Kenya especially for poor women. It is evident from the results that the project has achieved substantial progress in the area of maternal and perinatal health through building partnerships, supporting and strengthening community action, use of skilled attendance and birth and ensuring institutional preparedness at all levels.

A review of findings in the report shows that despite the short implementation phase of program activities, achievements were recorded in antenatal, intra partum and post partum cares services. The proportion of women with knowledge of risk and danger signs during pregnancy, labour and puerperium period was significantly higher at endline compared to the baseline data. More women received malaria prophylaxis and had appropriate laboratory tests during pregnancy. There was also significant improvement in the knowledge and skills of health care providers, which included the significant increase in the number of providers who use the partograph in the management of labour to prevent prolonged labour, as well as institutional preparedness in the management of obstetric complications and improved referral system.

Despite the achievements, the report has also outlined a few challenges. These include the need to focus on neonatal health, the early post-partum period and to encourage greater participation of men and the rest of the community in reproductive health including safe motherhood activities.

However, the report contains useful results and lessons that could be replicated in other districts in Kenya. Some of the lessons learnt could serve as a source of vital information on key strategies that could be applied to tackle some of the barriers in order for Kenya to achieve the appropriate Millennium Development Goals (MDGs) by 2015.

On behalf of the Ministry, I wish to take this opportunity to thank the Department for International Development (DFID) for having provided financial support to this project and Population Council and the University of Nairobi for providing technical assistance to the project at all levels during the planning, implementation and evaluation stages.

**Hon. Charity Kaluki Ngilu; MP**  
**MINISTER FOR HEALTH**

# TABLE OF CONTENTS

Acknowledgement .....	i
Executive Summary .....	ii
<i>Introduction</i> .....	ii
<i>Methodology</i> .....	ii
<i>Programme interventions to enhance access to maternal care</i> .....	ii
<i>Project Coordination and Management</i> .....	iii
<i>Results</i> .....	iii
<i>Challenges</i> .....	iv
<i>Conclusion</i> .....	iv
<i>Recommendations</i> .....	iv
Abbreviations and Acronyms .....	vi
Introduction .....	1
<i>Background</i> .....	1
<i>The Safe Motherhood Partnership Fund</i> .....	1
<i>The Safe Motherhood Demonstration Project</i> .....	2
<i>Conceptual framework and approach</i> .....	3
<i>Programme Plan</i> .....	5
<i>Programme interventions to enhance access to maternal care</i> .....	6
<i>Project coordination and management</i> .....	15
<i>Monitoring</i> .....	16
Findings .....	18
<i>Improving comprehensive and basic essential obstetric care and essential newborn care</i> ....	18
<i>Obstetric met need</i> .....	19
<i>Strengthening referral practices</i> .....	21
<i>Community Action</i> .....	22
<i>Maternal Health Services</i> .....	26
<i>Health organisational and management issues</i> .....	39
Discussion .....	42
<i>Skilled Attendance</i> .....	43
<i>Institutional Capacity Building</i> .....	43
<i>Partnerships</i> .....	44
<i>Community Action</i> .....	45
<i>Maternal Morbidity and Mortality Reduction</i> .....	45
<i>Lessons Learned from the SMDP</i> .....	45

Challenges for Scaling up Safe Motherhood and Neonatal Health Programming .....	47
<i>Way Forward and Programme Sustainability</i> .....	48
Conclusion and Recommendations .....	49
<i>Conclusions</i> .....	49
<i>Recommendations</i> .....	49
References .....	51
Appendix 1: Safe Motherhood Conceptual Framework.....	52
Appendix 2: Design and Methodology .....	53
<i>Study Design</i> .....	53
<i>Sampling and Data Collection</i> .....	53
<i>Data Analysis</i> .....	55
Appendix 3: Summary of providers recall on signs and action required for obstetric emergencies .....	56
Appendix 4: Cost of the SMDP in Western Kenya .....	59
Appendix 6: List Of Operational Health Facilities By District .....	62
List of operational health facilities by district .....	63
Appendix 7: Kenya Safe Motherhood and Neonatal Health Model .....	64
Appendix 8: Lists of Co-ordinators, Supervisors and Research Assistants .....	65
Appendix 9: List of Contributors .....	66
Appendix 10: District maps showing distribution of health facilities .....	67

## LIST OF FIGURES AND CHARTS

Chart 1:	Percent of women who received a first dose of SP at ANC .....	27
Chart 2:	Percent of facilities using MOH standard ANC cards .....	30
Chart 3:	Percent of nurses by signs used to establish labour during the last delivery they attended.....	311
Chart 4 :	Percent of providers by warning signs that would prompt a referral..	344
Chart 5:	Percent of facilities requesting women in labour to bring drugs and supplies .....	399
Chart 6:	Project costs by activity.....	59
Figure 1:	Approaches to addressing safe motherhood.....	4
Figure 2:	Birth Preparedness Model.....	8
Figure 3:	Health care procedure manual for health providers at facility level .....	40

## LIST OF TABLES

Table 1.	Data for districts selected for SMDP .....	3
Table 2.	Instruments used and sample sizes at baseline and endline surveys .....	6
Table 4.	Coverage of Essential Obstetric Care Services March 2003 .....	19
Table 5.	Process indicators and met need for obstetric care .....	20
Table 6.	Proportion of health facilities with capacity to provide key services or functions for basic essential obstetric care in 2002 .....	20
Table 7.	Time taken to get to the nearest health facility.....	22
Table 8.	Percent of facilities with stocks of SP, iron and folic acid, 2002 .....	27
Table 9.	Improvements in Antenatal care in Western Province .....	28
Table 10.	Attendants assisting women to give birth in their homes (%) .....	30
Table 11.	Quality of intrapartum care – health provider recall .....	32
Table 12.	Quality of intrapartum care – normal birth records .....	32
Table 13.	Health providers experience and management of obstetric problems .....	33
Table 14.	Major causes of death according to health providers' experience .....	33
Table 15.	Assessing health providers knowledge and practice in their management of obstetric complications .....	34
Table 16.	Improvements in management of obstetric complications.....	35
Table 17.	Age range of women from case patient records reviewed (by numbers)...	37
Table 18.	Type of postpartum service received by mother since giving birth.....	38
Table 19.	Major problems facing health facilities as perceived by providers .....	41



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# EXECUTIVE SUMMARY

## Introduction

Maternal mortality is a major public health problem in Kenya. Most recent estimates from the Kenya Demographic Health Survey 2003 are 414 deaths per 100,000 live births. Deteriorating public health services and the HIV/AIDS epidemic are contributing factors. Kenyan women face a 1 in 20 lifetime risk of maternal death, which is the leading cause (27%) among women of childbearing age in Kenya. Since March 2000, Population Council and the University of Nairobi have been assisting the Ministry of Health to implement Safe Motherhood activities in Kakamega, Vihiga, Bungoma and Lugari districts of Western Kenya. The purpose of the project was to increase utilization of quality maternal services in the selected districts.

## Methodology

The Safe Motherhood Conceptual Framework provided the basis for designing the project interventions and overall approach. In addition, use of the three delay model focused the activities in reducing maternal, perinatal and neonatal deaths: (i) delay in deciding to seek appropriate care; (ii) delay in reaching an appropriate health care level; and (iii) delay in receiving adequate emergency care once at a facility. Key issues identified that contributed to high maternal and perinatal morbidity and mortality were: poor referral systems, limited competence and skills among health providers, poor health information system, frequent shortages of essential equipment and supplies, weak management systems at all levels and limited access to basic obstetric care at community level.

A participatory approach involving relevant institutions and sectors was used in problem identification, analysis and implementation of interventions. A quasi-experimental design using a before and after approach was followed to compare and assess the impact of interventions at the community level and within health institutions in the four districts. A baseline survey was conducted in the year 2000 and an endline in 2003. Both probability and non-probability sampling procedures were used to address different study units and subjects within the project.

## Programme interventions to enhance access to maternal care

In an effort to improve pregnancy outcome, the project focused on improving quality of antenatal care, essential obstetric care, clean and safe delivery, post-partum care, post-abortion care and management issues at all levels. In addition, the project also focused on strengthening referral practices and on addressing factors responsible for delays by pregnant women in making decisions on when, where and how to seek care .

### Community Action

A number of interventions were piloted within the community to make essential obstetric care services more available at the community level. For example: improving the opening hours of rural health facilities; encouraging dispensaries to conduct deliveries; introduction of a birth preparedness scheme; educating women on danger signs in pregnancy and child birth; piloting a domiciliary birth model and involving TBAs in referral practices. Other interventions that were piloted at the community level include mobile laboratory services and increasing the number of outreach MCH clinics.

### Referral

Improving access for women with obstetric complications can only be effective where there is a functional referral system and equipment and supplies including availability of emergency drugs within facilities. The following interventions were put in place: improving telephone communications, maintenance and repair of vehicles/ambulances; management of referred cases with obstetric complications; training/updates on obstetric complications; and community involvement in developing revolving funds for emergency transport.

### **Management and institutional capacity**

Strengthening of specific systems in health management took place at all levels within the four districts. At baseline, weak management of health services was a major factor in the lack of quality maternity care. The interventions involved a series of teambuilding workshops, management skills workshops as well as improving their organisation structure and inter-institutional and inter-personal communication. In addition a review of flow of patients at the facilities, collection and utilisation of funds, planning and management of human resources; health information systems, and developing a sustainable procurement system of essential supplies, equipment and drugs were also undertaken.

### **Competency and skills of health care providers**

The competency and skills of health care providers at the various levels of institutions was improved through structured competency based training, regular facilitative supervision and technical updates for health care providers. This included on-the-job training (OJT) for health care providers in all aspects of essential obstetric care and incorporates the continuum of care from antenatal through to the post partum period and obstetric and neonatal complications.

### **Project Coordination and Management**

Division of Reproductive Health (DRH) was responsible for the policy aspects of the project. Population Council in collaboration with the University of Nairobi (UoN) provided Technical Assistance for the SMDP. The Provincial Medical Officer (PMO) chaired the Project Steering Committee, which provided guidance and coordination of all activities within the project area and served as a link between the districts and DRH at national level.

## **Results**

Given the relatively short intervention, this report demonstrates process and outcome indicators. Although the obstetric met need is still low there has been a marked increase over the project period including a reduction in the Case Fatality Rate.

*Antenatal Care:* significant increases were noted in use of standard ANC cards, the number of women receiving Intermittent Preventive Treatment for malaria, blood tests for Hb and syphilis and blood pressure recorded when they attended antenatal clinic. More women said they were seen in privacy and given the opportunity to ask questions and remembered danger signs during pregnancy.

*Intrapartum Care:* Provider knowledge and experience was to seen to improve over the project period. Significantly more providers are using partograph to manager labour and improved management of complications. More providers are monitoring labour more effectively and referring earlier. Fewer women gave birth after more than 12 hours of labour. Significantly more women are delivering with Skilled Attendance at home. Health care providers are now more knowledgeable about obstetric problems and have more experience to manage them.

*Post partum Care:* More women attend postpartum care especially if a skilled health care provider assisted them at birth. Women are now more likely to have their blood pressure measured and physical examination in postpartum clinic. However this is an area where an increased effort is required.

*Management and organisational issues* have improved including an improvement in systems for procurement of equipment, drugs and supplies. Fewer women had to bring in drugs and supplies during labour. More facilities are now able to provide Manual Vacuum Aspiration (MVA) services for post abortion care and provide 24-hour cover for maternity services. More health facilities are now using guidelines and protocols and there have been improvements in health facility management.

*At the community level* there was a significant increase in the number of women who gave birth at home with a skilled attendant and more dispensaries are providing care for women in labour and childbirth. Prepayment schemes for maternity care and birth preparedness models showed increased skilled attendance in areas where they were piloted.

A strong referral system is crucial in providing the linkages between community and facilities that offer essential obstetric and neonatal services. There were notable improvements the number of facilities that had access to working telephones and vehicles for transportation of emergency cases.

Overall, the proportion of women who had heard of a woman dying due to obstetric related complications reduced over the project period. However, despite a reduction in the proportion, a review of maternal deaths records showed that the number of maternal deaths during pregnancy increased at endline. This increase of deaths during pregnancy may indicate more deaths due to abortion complications and probably due to indirect causes such as severe malaria in pregnancy, HIV/AIDS, tuberculosis, cardiac diseases, severe anaemia, etc.

The situation regarding neonatal and perinatal health only improved marginally. For instance, thirty percent of women said they had lost at least one child at baseline compared to 28% at endline. The age of children who had died was not asked at baseline but among women who had lost a child aged one year or less at endline, 36% died within the first month of birth.

## Challenges

Despite the achievements mentioned within this report, there remain some challenges. These include weaknesses in providing essential newborn care and early postpartum care and to ensure adolescent mothers are supported to give birth safely. Men need to be more involved in the care of women and children. Wider community participation is crucial to encompass the cultural and social aspects of making motherhood safe. The Ministry of Health must take a more pro-active role in coordinating all aspects of MNH services in order to reduce maternal and neonatal morbidity and mortality.

## Conclusion

It is evident from the results that the project has largely achieved its purpose, which was to increase utilization of quality maternal services in the selected districts. Specifically, the project has made substantial progress in the area of maternal health as well as in the broader health system issues through building partnerships, supporting and strengthening community action, use of skilled attendance at birth and having in place a strengthened and supportive health management system at all levels. Emerging lessons from the project point to the fact that realising improvements requires a systems approach and that the four strategic interventions identified above need to work in a synergistic manner to increase utilisation of maternal services and increase the obstetric need in order to improve maternal health in Kenya especially for poor women.

## Recommendations

- Ensure effective replication and scale up of safe motherhood initiatives in other provinces in Kenya in line with the Division of Reproductive Health Safe Motherhood and Neonatal Model.
- Strengthen the technical capacity of the Division of Reproductive Health as well as the Provincial Reproductive Health Supervision and Training Teams.

- Incorporate the integrated reproductive health curricula into the basic training courses in all health-training institutions and disseminate evidence based best practice widely, including updates for all trainers/lecturers.
- Safe Motherhood and Neonatal Health is considered one of the essential packages within health sector reform and linkages with the other packages must be strengthened at national level in order to guide linkages at provincial and district levels.
- Develop a National RH policy and National Advocacy Strategy for Maternal and Neonatal Health: improve policy clarity and wide communication on making pregnancy safer issues (e.g. a national transitional strategy for TBAs is developed and domiciliary care strengthened).
- Ensure pro poor systems are in place to provide equitable maternity services countrywide.
- Strengthen post-partum care at all levels.
- Inter-sectoral action is needed to support adolescent mothers to give birth safely.
- Strategies aimed at encouraging communities to participate in safe motherhood activities should take into account the need to involve men as well as appreciate the importance of the cultural and social aspects of making motherhood safe.

## **ABBREVIATIONS AND ACRONYMS**

ANC	Antenatal Clinic
APH	Antepartum Haemorrhage
AMDD	Averting Maternal Death and Disability (Program)
BEOC	Basic Essential Obstetric Care
BP	Blood Pressure
BOH	Bad Obstetric History
C/S	Caesarean Section
CEOC	Comprehensive Essential Obstetric Care
CFR	Case Fatality Rate
CIF	Community Improvement Fund
CO	Clinical Officer
CORP	Community Owned Resource Person
Cx	Cervix
DFID	Department for International Development
DHMB	District Health Management Board
DHMT	District Health Management Team
DMC	Division of Malarial Control
DPHN	District Public Health Nurse
DO	District Officer
DRH	Division of Reproductive Health
EAs	Enumeration Areas
ECSAOGS	East, Central and Southern Africa Obstetrical and Gynaecological Societies
ENC	Essential Newborn Care
EOC	Essential Obstetric Care
FHR	Foetal Heart Rate
FGD	Focus Group Discussion
FIF	Facility Improvement Fund

FP	Family Planning
Hb	Haemoglobin
HFMC	Health Facility Management Committee
HIS	Health Information System
HIV	Human Immuno Deficiency Virus
HMT	Hospital Management Team
Hosp	Hospital
ICPD	International Conference on Population and Development
IEC	Information, Education and Communication
IPPF	International Planned Parenthood Federation
IV	Intravenous
IM	Intramuscular
IMR	Infant Mortality Rate
KDHS	Kenya Demographic and Health Survey
KOGS	Kenya Obstetrical and Gynaecological Society
KQM	Kenya Quality Model
KSPA	Kenya Service Provision Assessment
MCH	Maternal Child Health
MCSS	Ministry of Culture and Social Services
MoH	Ministry of Health
MOH	Medical Officer of Health
MMR	Maternal Mortality Ratio
MVA	Manual Vacuum Aspiration
MYWO	Maendeleo Ya Wanawake Organisation
NGO	Non-Governmental Organisation
NHSSP	National Health Sector Strategic Plan
NNAK	National Nurses Association of Kenya

OBS/GYN	Obstetric/Gynaecology
OJT	On-the-Job Training
OPR	Output to Purpose Review
PAC	Post Abortion Care
PC	Population Council
PGH	Provincial General Hospital
PHC	Primary Health Care
PHMT	Provincial Health Management Team
PHO	Public Health Officer
PMO	Provincial Medical Officer
PPC	Postpartum Clinic
PPH	Postpartum Haemorrhage
RHF	Rural Health Facility
RH	Reproductive Health
SP	Sulphadoxine and Pyrimethamine
SMDP	Safe Motherhood Demonstration Project
SPSS	Statistical Package for Social Sciences
TBA	Traditional Birth Attendants
TT	Tetanus Toxoid
UN	United Nations
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
VDRL	Venereal Diseases Research Laboratory
WHO	World Health Organisation



# INTRODUCTION

## Background

Maternal mortality is a major public health problem in Kenya. Most recent estimates by Kenya Demographic Health Survey 2003 are 414 maternal deaths per 100,000 live births. Deteriorating public health services and the HIV/AIDS epidemic are contributing factors. Kenyan women face a 1 in 20 lifetime risk of maternal death, which is the leading cause (27%) among women of childbearing age in Kenya. There are five major causes of maternal death: haemorrhage, infection, hypertensive disease in pregnancy, unsafe abortion and obstructed labour. Many of these deaths could be averted if women had access to essential obstetric care when they need it.

The conceptualisation and development of the Safe Motherhood Demonstration Project (SMDP) in Western Kenya was influenced by the growing international evidence on the need to operationalise crucial aspects of Reproductive Health including Safe Motherhood that stemmed from the International Conference for Population and Development (ICPD) in Cairo in 1994; the National RH Strategy (1997 to 2010) and the Reproductive Health Implementation Plan (1998 to 2003); and the DFID funded review of Safe Motherhood in Kenya (A Question of Survival 1997). Subsequently the Safe Motherhood Partnership Fund was set up in conjunction with DFID and the Ministry of Health. One of the aims was to pilot safe motherhood interventions, to generate lessons and best practices for scaling up maternal health activities throughout the rest of the country.

## The Safe Motherhood Partnership Fund

Under the Safe Motherhood Partnership Fund (SMPF) approved by DFID in 1999, the Safe Motherhood Demonstration Project was awarded to Population Council in partnership with the University of Nairobi's Departments of Obstetrics & Gynaecology and Community Health. The other two projects under the Partnership Fund were awarded to Family Care International (training of health staff in life saving skills in Garissa District)<sup>1</sup> and to JHPIEGO (developing guidelines in managing malaria in pregnancy including focused antenatal care in 19 districts)<sup>2</sup>.

The goal of the Safe Motherhood Partnership Fund was **to improve maternal health in Kenya especially for poor women** while the purpose was *to increase utilisation of quality maternal services in selected districts*. In order to achieve the purpose, three outputs were identified. These were:

- I. Improved service quality in antenatal, intrapartum, postpartum and post-abortion care in selected districts;
- II. Demonstrated effectiveness of systems of referral, access, health management and IEC in selected districts; and
- III. Government, non-Government and donor health strategies include enhanced and appropriate safe motherhood components.

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<sup>1</sup> The FCI project on life saving skills was completed in November 2001.

<sup>2</sup> The JHPIEGO project was initially started in two districts but has since been extended to cover 19 districts.

## The Safe Motherhood Demonstration Project

Population Council and the University of Nairobi assisted the Ministry of Health to implement the Safe Motherhood Demonstration Project in Kakamega, Vihiga, Lugari and Bungoma Districts in Western Province, Kenya. The criteria for selecting the four districts included:

- High fertility rate
- High maternal and neonatal mortality
- High proportion of people living in total poverty
- Population Density
- Maternal health and child survival identified as areas of concern by the districts.

Geographically, Western Province lies on the equator at an altitude ranging from 1000 to 4300 metres (the peak of Mount Elgon). The Province borders Uganda to the West, Lake Victoria/Nyanza Province to the South and Rift Valley Province to the North and East. The total province population is around 3.5 million whereas the population in the four demonstration districts is 2.4 million (See Table 1 for more information).

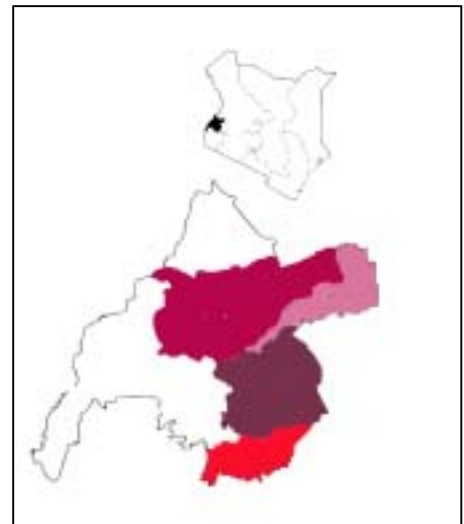
*Kakamega District* has two comprehensive essential obstetric care (CEOC) centres namely Kakamega Provincial General Hospital and St Elisabeth's Mukumu Mission Hospital. Although Malava health center was upgraded to a district, there are plans to scale up two health centres (Ighu and Bukura) to sub district hospitals to reduce over crowding at the provincial hospital. The district has 14 Health Centres, 13 Dispensaries and 11 Nursing Homes.

*Vihiga District* was carved out of the larger Kakamega District in 1991. In 2000 there was no district hospital. Two mission hospitals existed but due to management problems and staffing, neither of these provided CEOC. Women requiring emergency obstetric care services had to travel to Kakamega PGH, St Elisabeth's Mission Hospital in Kakamega District or PGH Kisumu in Nyanza Province. Since February 2002, Vihiga District Hospital has been providing CEOC. There are 17 Health Centres, 12 Dispensaries and 2 Nursing Homes in the district.

*Bungoma District* has six hospitals providing CEOC. One district hospital in Bungoma, two sub district hospitals (at Webuye and Kimilili), two mission hospitals (Misikhu Mission Hospital and Lugulu Friends Hospital) and one private hospital (Lumboka Hospital). There are 13 Health Centres, 33 Dispensaries, and 5 Nursing Homes. However, some divisions such as Ndivisi have no health facilities at all. Few of the rural health facilities are able to provide basic essential obstetric care (BEOC).

*Lugari District* was carved out of the larger Kakamega District in 1997. It has no CEOC and women requiring these services have to travel to Webuye (Bungoma District) or to hospitals in Eldoret or Kitale (Rift Valley Province). There are 5 Health Centres, 10 Dispensaries and 3 Nursing Homes. None of these are able to perform all the basic essential obstetric care functions.

*Western Province, Kenya*



## Project Beneficiaries

The primary beneficiaries were childbearing women and their newborn infants in the four districts. Secondary beneficiaries included immediate relatives and community members who often bear both the direct and indirect costs associated with maternal and perinatal morbidity and mortality. Health care providers and their managers were also considered as secondary beneficiaries.



*Primary beneficiaries were childbearing women and their newborn infants in the four districts*

**Table 1. Data for districts selected for SMDP**

	Population 1999	Population 2002	Density Persons/km <sup>2</sup>	Crude birth rate	Total Fertility Rate	Births 15–19 yr females	IMR/ 1000 live births	MMR/ 100,000 live births
Kenya	28, 62,000	31,517,00	49	41.3	5.0	11.8	77.3	590
Western Province	3,357,000	3,676,000	406	45.0	6.0	10.6	100.6	*
Kakamega District	603,000	670,000	432	44.0	5.7	11.0	110.9	*
Vihiga District	499,000	543,000	886	37.6	5.1	8.6	81.9	*
Bungoma District	876,000	977,000	423	46.6	6.4	9.6	97.0	*
Lugari District	216,000	240,000	322	44.8	6.1	9.5	64.1	*

*\*Inaccurate data available to compute*

*Data source: Kenya Population and Central Bureau of Statistics Ministry of Planning and National Development (2002)*

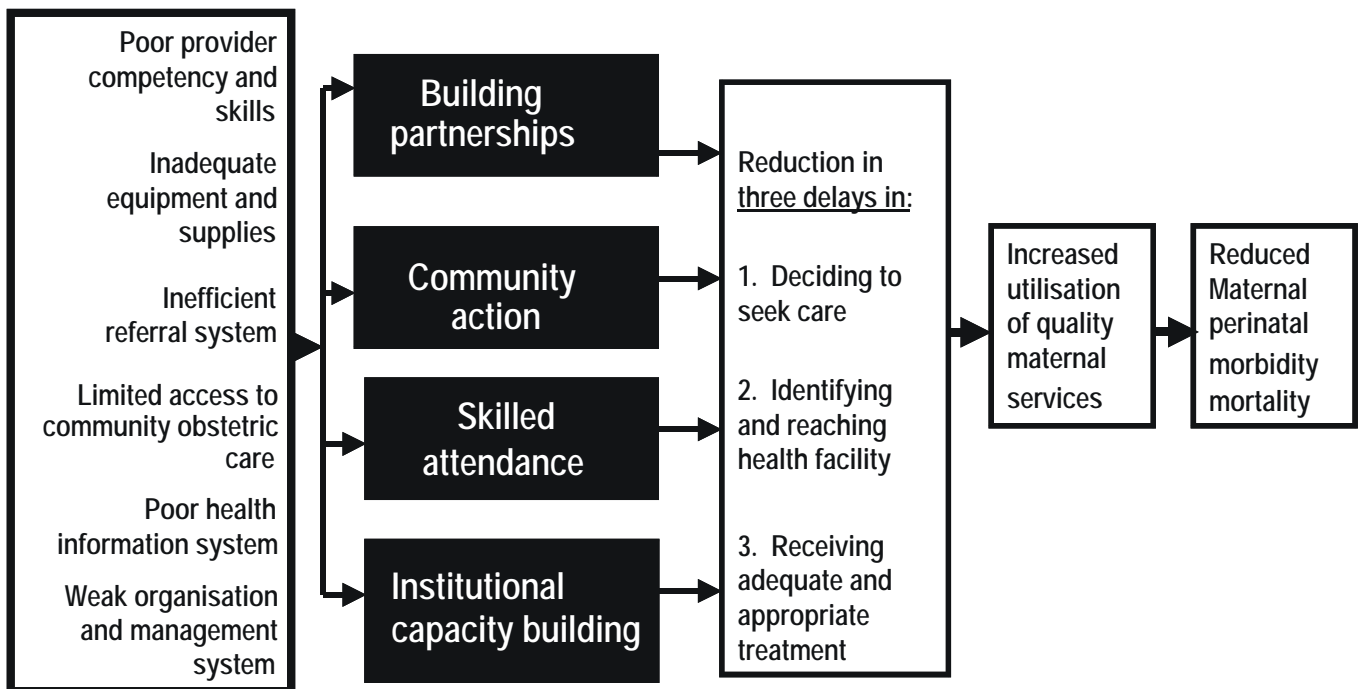
## Conceptual framework and approach

The Safe Motherhood Conceptual Framework developed by McCarthy and Maine in 1992 (see appendix 1) provided the basis for designing the project interventions and overall approach. In addition use of the three delay model focused the activities in reducing maternal, perinatal and neonatal deaths: (i) delay in deciding to seek appropriate care; (ii) delay in reaching an appropriate health care level; and

(iii) delay in receiving adequate emergency care once at a facility (Thaddeus and Maine, 1994). The project also took into consideration the World Health Organization's (WHO 1995) four pillars of Safe Motherhood: antenatal care, clean and safe delivery, essential obstetric care and family planning. Family planning was not emphasized in this project as other partners in RH were supporting this component adequately at the time of the design.

The SMDP model (figure 1) was developed taking into consideration the three delay and the WHO models. The SMDP model also took into consideration the results of an initial situation analysis and stakeholders meeting which identified factors contributing to the high number of maternal deaths. This model encapsulates the processes required to increase utilization of quality services and thereby reduce maternal and neonatal deaths.

**Figure 1. Approaches to addressing safe motherhood**



## Programme Plan

### Participatory Approach in Project Planning

To ensure that the project becomes sustainable and its activities replicable and scalable, targeted effort was made from project inception to involve all relevant people and institutions in problem identification, situation analysis, development of the logical framework planning matrices, implementation of activities, as well as monitoring and evaluation. The participants and institutions included the following: Population Council, staff from the Division of Reproductive Health and Ministry of Health headquarters, the Western Provincial Health Management Team, the Kakamega, Vihiga, Lugari and Bungoma District Health Management Teams and Boards, teaching staff of the University of Nairobi Departments of Obstetrics & Gynaecology and Community Health, Mission/NGOs/private/GOK facilities, relevant NGOs operating in the four districts e.g. Maendeleo Ya Wanawake Organisation, Department of Births and Deaths, Provincial Administration and District Development Officers.

### Situation Analysis and Core Problems

A situation analysis held in March 2000 by stakeholders at district level identified the following factors as contributing to high maternal and perinatal morbidity and mortality: poor referral systems, limited competence and skills among service providers, poor health information system, frequent shortages of essential equipment and supplies, weak management systems at all levels and limited access to basic obstetric care at the community level. The project focused on these areas in an effort to improve pregnancy outcome.

### Project Interventions and Building Blocks at District Level

Taking into account the problems identified during the situation analysis and the broader goal, purpose and outputs of the Safe Motherhood Partnership Fund the stakeholders designed interventions appropriate to each district following the development of the logical frame and the analysis of the baseline survey. The strategies used in the implementation were: improving provider competency and skills, strengthening health management systems (institutional capacity building), improving health information system, improving a sustainable system for equipment and supplies, improving the referral system, and aspects of essential obstetric care at community level.

These interventions and processes served as *building blocks* towards the realisation of improvements in the quality of antenatal care, essential obstetric care, clean and safe delivery, post-partum care, post-abortion care and management issues at all levels. In addition, the interventions and processes also sought to strengthen referral practices and address factors responsible for delays by pregnant women in making decisions on when, where and how to seek care at the community level.

Initiatives were designed to take full advantage of inherent strengths in place and existing infrastructure within each of the districts. It was realized that for the health teams to achieve the set objectives, they needed to change their working culture. This involved strengthening leadership approaches among the PHMT, DHMTs and HMTs, as well as improving technical capacities of health providers. Institutional preparedness preceded community mobilization to avoid a situation where mobilized community members were to attend institutions that were ill prepared for their various needs and concerns.

Quality assurance was emphasised throughout the implementation phase of the project, particularly on issues that were important in guaranteeing safe outcome for mothers and their babies.

Quasi-experimental design was used (see Appendix 2 for details) to measure the process and outcome indicators of the SMDP. Both probability and non-probability sampling procedures addressed different study units and subjects within the project. Table 2 shows the instruments used to collect the data for the baseline and endline surveys. The number of study units was reduced at the end line due to a fewer number of indicators measured. Results from the two surveys were used to assess the outcome and impact of the pilot project.

**Table 2. Instruments used and sample sizes at baseline and endline surveys**

<b>Instrument</b>	<b>Baseline</b>	<b>Endline</b>
Women at household	4026	1427
Antenatal exit	337	152
Postpartum exit	279	97
Post abortion care exit	13	6
Health care provider interview	307	143
Health facility	83	59
Record review for normal labour	243	213
Record review for eclampsia	29	10
Record review for obstructed labour	78	29
Record review for caesarean section	83	70
Management	21	0
FGDs men and women	8	8
FGDs with TBAs	0	4

## **Programme interventions to enhance access to maternal care**

### **Essential Obstetric Care at Community Level**

During the SMDP situation analysis, a number of issues were identified as contributing to high maternal and perinatal morbidity and mortality especially at the community level. These were: complications associated with incomplete abortion, poor management of labour by TBAs, unclean and high proportion of unsafe home deliveries, retrogressive practices including use of herbal medicine during labour, and limited use of maternity facilities for delivery.

Other constraints include inadequate information on reproductive health issues for women, inadequate collection of essential health information at the community level (e.g number of births and deaths, disease prevalence), loss of public confidence in the institutions and the staff, unnecessary delays in seeking care by mothers in labour, lack of transport and delayed referral of women with obstetric complications to health facilities. Some of these constraints contribute either directly or indirectly to delays in deciding to seek care at the household or in the community.

In order to undertake activities for the identified constraints, a number of interventions were piloted at community level to make essential obstetric care services more available at the community level e.g. improving the opening hours of rural health facilities; encouraging dispensaries to conduct deliveries; introduction of birth preparedness cards and birth preparedness scheme; educating women on danger signs in pregnancy and child birth; piloting a domiciliary birth model; and involving TBAs in referral practices providing mobile laboratory services and increasing the number of outreach MCH clinics. These interventions are outlined below.

#### *Strengthening dispensaries to conduct deliveries*

Historically dispensaries did not provide delivery services and were staffed by enrolled nurses who had no midwifery skills. This changed in 1989 when the enrolled nurse curriculum was updated and all nurses studied midwifery in their training.

Following the EOC updates and practical experience gained in the maternity units in busy hospitals, many of the nurses/midwives deployed to



*Nurses attending EOC update*

the rural facilities were encouraged to provide maternal services to women. Delivery kits and other equipment were provided to enable this to happen. In some districts, the Provincial Health Management Team re-deployed health care providers to ensure 24-hour coverage of rural health facilities especially in situations where staff had been trained in EOC.

#### *Improving community awareness*

To address the issue of lack of knowledge and information on the danger signs related to pregnancy and childbirth within the community, appropriate IEC materials were either developed or existing ones adapted and distributed. This involved assessing existing materials at the Division of Reproductive Health, Division of Health Education, WHO and other RH partners. Posters and leaflets for mothers to take home, describing aspects of care during pregnancy, childbirth and the postpartum period were reprinted and distributed to the health facilities and community based groups. Community orientation materials for malaria in pregnancy and focused antenatal care developed by the DRH, DOMC and JHPIEGO were re-printed and distributed.

Health care providers were encouraged to link with the rural health development committees to use every opportunity i.e. within churches and women's group meetings to pass healthy messages and recommendations to seek skilled attendance during and after pregnancy.

Husbands/relatives or even TBAs were encouraged to escort women in labour to the health facility and to stay with the woman throughout her confinement to give her psychosocial support. This of course depends on the woman and family's preference. Evidence by WHO (2003) has shown that women who have a companion throughout labour in addition to skilled personnel are more likely to require less pain relief and have a more positive experience.

*Birth Preparedness Model*

The birth preparedness model aims to stimulate active health care seeking behaviour among pregnant women. Given that a high proportion of deliveries still take place at home, most obstetric complications are therefore likely to occur at that level. In order to address this problem, a birth preparedness model was developed. It involved the development of a birth preparedness card (see figure 2) which has basic information on pregnancy care; birth preparatory arrangements (such as items that would be required during delivery and availability of funds); danger signs in pregnancy and childbirth; referral and where to seek help in an emergency; and is geared towards preparing the pregnant woman to engage in appropriate health care seeking practices. The model seeks to reduce mainly the first and second level delays.

**Figure 2. Birth Preparedness Model** (These cards were distributed by women groups)





### *Pre-payment Scheme*

Many people in rural areas have meagre and irregular incomes. The livelihood of most households in Western Kenya is drawn from sale of farm produce or peddling household consumer goods. From this type of business, it is difficult to afford user fees for health care if paid as a lump sum. In response to the financial barriers preventing women from seeking health care; a pre-payment scheme was introduced to communities in catchment areas around four health centres to allow mothers to meet user fees by paying convenient instalments during pregnancy. The scheme seeks to promote early use of antenatal care and delivery with skilled providers. Once registered, a member of this scheme is entitled to a specific range of services when the need arises during the entire gestation period without having to pay at the particular time the service is given. Such benefits include:

- Discount if a pregnant woman requires referral to hospital from a health centre or dispensary;
- Standard laboratory tests required during pregnancy;
- Intermittent preventive treatment for malaria;
- Skilled attendance at birth, and appropriate referral to a comprehensive EOC facility.

To encourage enrolment, small instalments are distributed over the entire gestation period.

This model was implemented through Health Centre Management Teams, Health Centre Development Committees and community-based groups in both Lugari and Vihiga districts and members of Maendeleo Ya Wanawake Organization (MYWO) and the Department of Culture and Social Services.

Table 3 provides an estimate of the cost of one delivery in a rural health facility in Western Province if each item was to be bought separately. When women pay into the pre-payment scheme, the facility is then able to buy supplies and drugs in bulk thus reducing costs. Women who enrol early enough pay KShs 300 in instalments. Those who are unable to pay the full amount before delivery, pay the remaining balance afterwards and still access the benefits of the scheme.

**Table 3 Average cost of inputs and services for a delivery in a rural health facility March 2003**

Item	Cost (Kshs)
Bed admission	50
Suture (1 piece)	75
Jik	65
Cotton wool	40
Cord clamp	30
Gauze	20
Ergometrine	15
Washing soap	15
1 needle and syringe	10
Hibitane	5
Bathing soap	5
<b>Total</b>	<b>330 (\$4.2)</b>

### *Domiciliary Care Model*

Information from the baseline survey indicated that of 73% of deliveries that took place at home, only one percent did so with a skilled midwife. The domiciliary care model was therefore developed to increase the proportion of births receiving skilled attendance at home. Healthcare providers were equipped with the delivery kits and supplies required to assist women in labour within their neighbourhoods. Employed nurses also assisted when they are off duty, on leave, during weekends, public holidays and at night. Unemployed or retired nurses also assist at community level. The model's emphasis is focused on empowering the midwife with skills to assist women to give birth at home, to manage minor complications and know when to refer to an emergency centre from the home level.

Through this strategy, many women who would otherwise be unable to reach health facilities end up having equal access to professional care leading to safe deliveries. Willing midwives were given delivery kits for use within their respective communities.

### *Mobile Laboratory*

Majority of rural health facilities have no laboratory services. Vihiga District developed a system whereby laboratory personnel from the district headquarters travel to rural health facilities with equipment and reagents to provide laboratory services. This includes all tests recommended during pregnancy (antenatal care profile), such as haemoglobin estimation, VDRL, blood grouping and urinalysis. In addition, other tests such as Widal and blood slides for malaria parasites are offered at minimal costs for other patients too.

### *Mobile Maternal and Child Health Clinics*

In order to provide services to areas with limited access to fixed maternal and child health care, rural health facilities were encouraged to run mobile outreach clinics. Historically these were quite common and popular, but due to lack of funds were often discontinued.

## **Improving the Referral System**

Improving access for women with obstetric complications can only be effective where there is a functional referral system, equipment and medical supplies including emergency drugs. The following interventions were put in place to make the system successful.

*Telephones:* Connection of landlines and public telephone booths were installed in appropriate health facilities. Cell phones were also made available. An agreement with police stations, DO's office, etc was made to allow health works to call a suitably located "ambulance" or vehicle to evacuate emergency cases to the next level of care.

*Vehicles:* Health facilities set aside part of their facility improvement fund to meet emergency transport costs. A functional ambulance was identified at the District level and served facilities in areas that were connected to the district hospital by telephone. SMDP funds repaired and/or maintained these vehicles. Communities were encouraged and assisted to set up revolving funds from which families could borrow money to pay for transport to a referral facility during obstetric emergencies and refund later. This included meeting fuel costs for any ambulance in the neighbourhood where financial resources are not readily available.

*Management:* At the referral hospital level, management systems were reorganised to ensure improved handling of emergencies. A logbook for all referrals and referral letters were introduced giving referring facilities adequate information with regard to the patients' condition. Health Management Boards and Health Centre Development Committees were expected to ensure that vehicles were in good condition at all times and easily accessed during emergencies.

*Training/updates and supervision:* At health facility level, health workers received essential obstetric skills updates in order to manage labour optimally, recognise and refer or anticipate problems early. Midwives based at health facilities were encouraged to be actively involved in supervising existing TBAs and ensuring they were aware of when complications and emergencies were likely to occur to ensure timely referral.

*Community level:* Rural health facilities, communities and families worked together in devising ways to improve the linkages and networks for ensuring a rapid response regarding referral of emergency cases. Public Health Officers actively encouraged antenatal attendance, birth preparedness and skilled care at birth in an effort to reduce the first delay (in making a decision to seek care).

### **Capacity Building at Institutional Level**

Strengthening of specific systems in health management took place at all levels within the four districts. At baseline, weak management of health services was a major factor underlying poor quality maternity care. Specifically, there was minimal maintenance of essential obstetric equipment and inadequate or erratic procurement system for consumable supplies and drugs. Management of health information was almost non-existent and transport and referral was generally an *ad hoc* affair. Weak organisation skills among senior members of DHMTs, PHMTs and Hospital managers resulted in poor deployment of staff, out of date job descriptions, no duty rosters and minimal supervision and planning.



*An ambulance used for transporting referral cases at Mabusi Health Center, Lugari District*

Management interventions involved a series of teambuilding and management workshops for hospital staff, DHMBs and DHMTs to improve their organisation and communication skills. Reviewing the flow of patients at the facilities; collection and utilisation of funds, planning and management of human resources and development of a sustainable procurement system of supplies and drugs were among other topics discussed. In addition, job descriptions were updated and circulated to relevant staff. Organograms organisation charts were also developed to demonstrate the management structures.

As a strategy for strengthening the capacity of health managers in the SMDP districts, a visit to exemplary sites in Nyeri and Thika districts of Central Province took place in September 2001. The objective was to provide an opportunity for members of the DHMTs, HMTs, DHMBs and HMBs to visit other districts outside their province with a view to sharing experience and learning from each other. It was expected that the participants would gain knowledge and skills on strengthening health systems at all levels, share experience on different approaches to strengthening EOC at community level, and learn strategies for tackling service delivery constraints.

### **Improving the Health Management Information System**

All four Districts identified HMIS as an area to be addressed. This was confirmed by the baseline survey where, incomplete records were found or were non-existent. The areas addressed were at management and facility level and information collection at community level.

#### *Provincial Health Information*

Since the PHMT is the convenor of the Project Steering Committee meetings, it was deliberately engaged to ensure that timely reports by districts were prepared and submitted. It accomplished this through regular supervision of DHMTs and HMTs. The PHMT, in turn, prepared the provincial annual health report and submitted the same to the Ministry of Health headquarters with copies to the DHMTs and HMTs. Availability of the necessary stationery and forms was ensured through the FIF and routine government financial allocations. The EOC updates and other training sessions were also coordinated by the PHMT.



*Iguhu Health Centre staff, Kakamega District and a representative from Division of Reproductive Health*

#### *Health Information System at facility level*

The SMDP identified gaps in the collection and collating of health information pertaining to maternal and neonatal health. Patient registers; records, forms and charts were reviewed, revised and /or made available using the existing Health Information System. The SMDP provided sufficient copies of forms to each facility initially. Following this, the facility management committee were able to negotiate funds from cost sharing to ensure essential stationery was always available.

The registers that were available in most of the health facilities included: delivery registers, general admissions register, female ward register, operating theatre register and post – abortion care register. These registers were standardised following discussion between MOH/UoN/PC. Maintenance of accurate maternity/delivery records (and all other health facility records) at health centres and hospitals enabled health staff to plan and use the information. Each health facility staff received updates to maintain presentations on the notice boards or display boards in the appropriate service rooms or examples of the type of data and information displayed included monthly service utilization statistics such as: Antenatal clinic attendance; Child Immunisation; Postnatal/partum clinic attendance: births by skilled attendants (both

facility and community); Facility Improvement Fund (FIF) monthly collections; Family Planning clients (new, revisits and methods); and Deaths.

#### *Community health information*

Community based information was often collected by PHTs and Community Owned Resource Persons (CORPs) and submitted to the health facility within the catchment area. This information was then summarised and posted on the chalkboard for discussion with the respective rural health facility development committees and community members. Each facility submitted monthly reports to the DHMT, which reviewed and collated them into comprehensive district reports and sent them to relevant authorities and institutions. The DHMTs were encouraged and trained where necessary, to use computers to analyse, store and retrieve information.

#### **Improving A Sustainable System for Equipment, Drugs and Supplies**

Availability of functional and serviceable equipment was assessed at each facility and excess equipment was re-distributed to facilities in need while non-functional equipment was repaired. Based on identified gaps, a complement of obstetric equipment for each District was procured. A start up package of basic consumables was given to facilities through support of the SMDP..

A key intervention during the SMDP was improving the system for procuring drugs and supplies. Health Facility Management Committees (HFMC) were encouraged to purchase in bulk and to set fixed fees for service. Health workers received training in the use and maintenance of all equipment and they were provided with instructions and guidelines for proper cleaning, storage and servicing of the equipment. Comprehensive inventories were maintained and regular inspections carried out to monitor losses or damage in a timely manner. This facilitated budgeting for new and replacement of lost and/or damaged items.

The routine supply of essential drugs and basic supplies in kits by the Government continued. Providers were trained in rational use of drugs including those used in obstetric care and provided with the national standard treatment guidelines (clinical guidelines). The World Health Organisation (WHO) has a well-defined essential drug list, as well as the equipment list, for mother-baby package at each level (WHO 1994). These lists were adapted and provided to the District Health Management Teams.



*Service providers during EOC training sessions in 2001*

Health Facility Management Committees have the mandate and autonomy to manage the cost sharing activities at the facility. They decide on the fee levels, the mechanisms to levy the fees as well as exempt those who cannot afford to pay. They also decide on priority expenditure areas and, with training and guidance from the DHMT and PHMT, manage the banking and expenditure of facility improvement funds. In particular, these committees procure supplementary drugs and basic supplies. Following consultations with the national level, the majority of public health facilities

have been issued with guidelines on how to standardise user fees. In addition the project updated these committees on how to be more effective.

### **Competency and Skills of Health Care Providers**

The competency and skills of health care providers at the various levels of institutions was improved through structured competency based training, regular facilitative supervision and technical updates for health care providers. This included On-the-Job Training (OJT) for health care providers (preceptors) in all aspects of essential obstetric care and incorporated the continuum of care from antenatal through to the post partum period and obstetric and neonatal complications. In addition modules on data collection, interpersonal skills, emergency preparedness and infection control were also included. The preceptors, upon return to their stations, continued OJT of their colleagues.

The EOC update was an intensive 5-day residential course based in one of the districts. Practical sessions took place in both the public and mission hospitals. For Kakamega and Vihiga participants the hospitals were PGH Kakamega and St Elisabeth's Hospital Mukumu. The theoretical sessions took place at the Kenafya PHC Centre. For Bungoma and Lugari participants the practical sessions took place in Webuye sub-district hospital, Bungoma District Hospital, Misikhu Mission Hospital and Lugulu Friends Mission Hospital. Theoretical sessions took place in Park Villa Hotel, Webuye.

The Dept ObGyn (University of Nairobi), the DRH and Population Council developed training materials on evidence-based practices in essential obstetric care, which were used in the technical updates. *The Essential Obstetric Care Manual for Health Care Providers in Kenya* was developed and disseminated to facilities in the four districts to further strengthen competency and skills of health care providers. The manual has a detailed section on management of normal labour and delivery including application of the partograph as well as the management of obstetric complications. In 2001, in Kenya, there were no formal publications or manuals on the management of women from antenatal care to the post partum period. The Ministry of Health has therefore adopted this manual for updating all health care providers in Essential Obstetric Care.

The DHMTs, the facility in-charges and nursing officers in-charge of maternity units as well as members from the DRH/UoN, provided facilitative supervision. Review of partographs used during normal labour in facilities in the four districts was part of the monitoring activities. This assessed completeness and accuracy of entering information on the important events during labour and appropriateness of the action that followed depending on the partograph findings. Health workers were encouraged to prepare and work according to daily work schedules and allocated tasks.



*Nursing officers in-charge of maternity provided facilitative supervision (Sr Amina Baraka and Mical Muganda)*

Availability of service provider manuals and guidelines was assessed and where there were shortages, the manual guidelines were distributed to providers in health facilities. Job aids developed by the MOH and other RH partners with information on essential obstetric care were adapted or reprinted for distribution to health care providers. These included the malaria in pregnancy and antenatal care guidelines developed by the DRH, DOMC and JHPIEGO; posters developed by MOH; and WHO and a postpartum care job aide developed by Population Council.

At facility or unit level, providers met regularly (weekly) to review performance and plan for the week ahead. Regular clinical meetings were organised to provide staff with the opportunity to review, discuss and learn from case studies of patients. Monthly mortality meetings were arranged and documented. All maternal and perinatal deaths were reviewed in detail from admission to death to identify areas where corrective action was to be taken in future to prevent recurrence.



*Service providers at a weekly planning meeting*

Providers at all levels were encouraged to adopt and sustain appropriate client-provider relationships. A simple “safe motherhood newsletter” was produced and distributed to all health workers in the four districts to provide update on RH and topical issues in health. The PHMT coordinated this exercise with support from the Population Council. The newsletter was produced on a quarterly basis.

## **Project coordination and management**

The DRH was responsible for the policy aspects of the project. Population Council in collaboration with the UoN provided Technical Assistance for the SMDP. However, the PMO chaired the Project Steering Committee and coordinated all SMDP activities. Members included the Medical Superintendent at Kakamega PGH, an Obstetrician Gynaecologist from the Provincial Hospital, the four Medical Officers of Health (MOHs) and District Public Health Nurses (DPHNs), as well as representatives from Mission hospitals. The Project Steering Committee provided guidance and coordination of all activities within the project area and served as a link between the districts and DRH at national level. The roles and functions of each partner are briefly outlined below.

### *The Division of Reproductive Health*

The Division of Reproductive Health (DRH) facilitated the process of implementing the reproductive health programme including safe motherhood. DRH also undertook monitoring and evaluation of the programme. Representatives from other MOH departments were involved, including the Division of Nursing and Health Sector Reform Secretariat.

#### *The Provincial Health Management Team*

The Provincial Health Management Team under the chairmanship of the PMO provided overall coordination of the programme at regional level with representatives from mission, provincial reproductive health teams, district health teams, NGO and private hospitals.

#### *The Clinical Support Team*

This team was made up of academic staff from the Dept of ObGyn, University of Nairobi, obstetrician/gynaecologists (including post-graduate registrars), paediatricians, medical officers of health, senior nurses and nurse trainers from DRH. The team was responsible for developing training materials and updating health care providers at all levels in EOC. This team has now been redefined as the Reproductive Health Training and Supervision Team at Provincial level.

#### *The District Health Management Team (DHMT)*

The team coordinated and supervised all health and health-related activities in the district. The DHMTs worked closely with the clinical support team to train/update health providers and health facility management committees. In addition, DHMTs participated in community mobilization activities.

#### *The District Health Management Board (DHMB)*

The boards ensured optimal management of facility improvement funds, that supplementary drugs and other supplies were procured, and that transport, fuel and telephones were paid for amongst others issues. In addition, the boards mobilised additional resources to support safe motherhood/reproductive health initiatives.

#### *The Health Facility Management Committee (HFMC)*

Health Facility Management Committees participated in community mobilization and sensitisation activities. They were used as the entry point to the community at large for developing demand-driven services from health facilities.

#### *Population Council*

The Population Council backstopped the whole project and provided Technical Assistance to the MoH at Central, Provincial and District level. The Council also developed data collection tools and facilitated collection and analysis of data for both baseline and endline surveys. In addition, Population Council coordinated the development of training materials and training of health workers in both EOC and management and planning, and also assisted in developing pro-poor models to improve access and utilisation of various reproductive health activities including safe motherhood activities.

#### *University of Nairobi: Departments of Obstetrics and Gynaecology and Community Health*

The University of Nairobi worked closely in collaboration with Population Council to provide Technical Assistance to the MOH and specifically in training both health care providers and health managers and the development of technical manuals. They provided technical support across all areas of the project.

## **Monitoring**

Population Council (in conjunction with the UoN and the DRH) developed a monthly monitoring tool on management issues and utilisation of services. This tool was used for each health facility (public, mission and private health facilities) in the four districts.



Examples of data collected, included number and type of deliveries, maternal and neonatal deaths, antenatal and postnatal attendance; obstetric emergencies; signal functions of obstetric care, staffing levels; obstetric equipment and supplies, and management issues. Data were entered using EPI Info and analysed using SPSS.

Regular monitoring visits to the districts, individual facilities and communities took place. Monitoring teams included members from the DRH, DoN, UoN and Population Council. Health care providers were also followed-up closely through supportive supervision from the trainers and DHMT members. The SMDP was monitored throughout by the MOH and DFID. Monitoring and supervision included both internal and external annual reviews where project outputs were measured against the purpose.

## FINDINGS

The results of the project are presented below in four sections: coverage and availability of obstetric and neonatal services, referral, community and maternal health services (including health organisation and management). The impact of the interventions is evaluated by making comparisons between baseline and endline findings in the intervention districts. Although some results are compared between districts, only those differences that are statistically significant between baseline and endline measures at the level of 0.05 or higher are considered meaningful.

### Improving comprehensive and basic essential obstetric care and essential newborn care

#### *Capacity to handle obstetric emergencies*

The United Nations obstetric process indicators use facility based data and population based estimates of the number of expected births and complications over a given time. They are based on the assumption that 15% of all women giving birth will require emergency obstetric care. To prevent the majority of maternal deaths, essential obstetric care must be available, accessible and equitably distributed and utilised by women who require this care. A basic essential obstetric care facility should be able to administer antibiotics, oxytocic drugs and anticonvulsants by injection or intravenously; perform manual removal of placenta and manual vacuum aspiration of retained placenta material, and perform assisted vaginal delivery. A facility providing comprehensive essential obstetric care should have the capacity to perform caesarean sections and blood transfusion besides the other six signal functions.

#### *Basic Essential Obstetric Care*

Generally intravenous antibiotics, anticonvulsants and oxytocics were the most available and administered drugs with over 80% of all facilities at endline carrying out these procedures. Most facilities can provide these functions easily and also have the potential to increase the range of services. Even though there has been an increase in the number of facilities able to provide MVA services, there are still a number of facilities unable to provide MVA all the time possibly because staff members are yet to be trained or women may still not be aware of the services available.

Although capacity may exist to conduct assisted vaginal deliveries (vacuum extraction at birth using instrument such as ventouse), there is an overall reluctance to practice this mode of delivery due to the anticipated high level of “failure rate” even in the Provincial General Hospital and district hospitals. It is generally believed that if the procedure fails the patient requires immediate emergency caesarean section (within half an hour). Reluctance among health care providers is probably due either to lack of competence and confidence or lack of equipment. However, in reviewing data from one of the mission hospitals only one out of ten cases of assisted vaginal delivery required an emergency caesarean section.

Health workers in rural health facilities have been advised to use the partograph to manage women in labour and refer early if there are any signs of prolonged or obstructed labour to CEOC Centres with caesarean section facilities.

Table 4 outlines the situation in the four districts during the endline survey in 2003. Bungoma District has the highest proportion of CEOC facilities to population. However, three of these hospitals are private or mission facilities hence charge relatively high fees for their service and facilities therefore are not available for the poor women (see maps in appendix 10 for distribution).

**Table 4. Coverage of Essential Obstetric Care Services March 2003**

UN Process Indicators	Districts/ Population (1999 census)				Recommended Minimum
	Kakamega	Vihiga	Bungoma	Lugari	
	657,456	543,558	955,763	235,433	
Number of Comprehensive EOC Centres (8 functions)	2.6 per 500,000	2.2 per 500,000	11.47 per 500,000	0	1/500,000
Number of BEOC Centres With 6 Signal Functions	0 per 500,000	2.2 per 500,000	3.8 per 500,000	0	4/500,000
Number of EOC Centres 5 Signal Functions†	3	6	1	1	
Other facilities with limited capacity (or potential)	18+	8	21+	14	This includes mainly public facilities

† None of these Health Centres performed Assisted Vaginal delivery. This procedure is usually performed in hospitals only (see text).

#### *Comprehensive Essential Obstetric Care*

There are 11 facilities across the districts that are able to provide comprehensive essential obstetric care. Lugari District does not have a comprehensive essential obstetric care centre. Women in Lugari District requiring caesarean section have to go to hospitals in Kitale, Eldoret or Bungoma for such care. In the past, a mission hospital in Vihiga was able to perform caesarean section, but since the year 2000, very few have been done due to lack of skilled personnel and management problems within this hospital. However, Vihiga District Hospital (opened in January 2002 and after a number of teething problems), now has a functioning theatre and is able to provide caesarean section.

### **Obstetric met need**

The obstetric met need, which is the proportion of expected emergency cases that are actually managed in an EOC centre is calculated for each district. An indication of the met need within the two districts, which had comprehensive essential obstetric care centres throughout the project period, is reflected in Table 5.

The over all case fatality rate for obstetric complications (facility-based data) decreased from 3.0% in 2000 to 2.4% in 2002. Bungoma continues to get late referrals from neighbouring districts that were not part of the SMDP.

**Table 5. Process indicators and met need for obstetric care**

Process indicators	Kakamega	Vihiga	Bungoma	Lugari	
Births attended by skilled attendants at home and within facilities					At least 15% of all births in population. Every woman has a right to skilled attendance at delivery
Baseline	32%	25%	26%	25%	
Endline	33.2%	34%	27%	25%	
Obstetric Met Need					100% of women with complications are treated in EOC facilities
Baseline	26%	†	7%	N/a	
Endline	34%	19%	17%	8%	
Population based caesarean section rate					As a proportion of all births between 5 & 15%
Baseline	2.9%	†	1.2%	No CEOC	
Endline	3.2%	0.7%	1.5%		
C/S rate institutional:					
Baseline	9%	†	6%	No CEOC	
Endline	12%	6%	8%		
Case Fatality Rate					For women with obstetric complications should be < 1%
Baseline	2.48%	†	5.19%	No CEOC	
Endline	1.6%	12%†	4%		

\* Significant at 0.05 level † Information not available/incomplete data available

Table 6 outlines the proportion of rural health facilities able to or had the capacity to provide key services or functions in 2002. A majority of the health facilities across the districts provide antenatal care and delivery services, while fewer offer laboratory services and the more invasive obstetric procedures requiring additional skills such as MVA.

**Table 6 Proportion of health facilities with capacity to provide key services or functions for basic essential obstetric care in 2002**

District	ANC	Normal birth	Lab Service	MVA	Assisted Vaginal Delivery	Manual Removal Placenta	IV Anti-biotics	IV/IM Oxytocics	Anti convulsants (Valium)
Kakamega	100%	79%	60%	21%	12%	27%	100%	82%	93%
Vihiga	77%	100%	68%	41%	30%	22%	75%	86%	92%
Bungoma	95%	92%	73%	25%	21%	10%	100%	97%	100%
Lugari	100%	94%	52%	18%	7%	0%	100%	100%	93%

*Essential Newborn Care (ENC)* This comprises of basic preventive care during pregnancy, clean birthing practices, warmth, eye and cord care and early and exclusive breastfeeding on demand. It includes early detection of problems or danger signs and appropriate referral, care seeking and treatment of key problems such as asphyxia and sepsis.

Care of both mother and baby are inextricably linked – interventions during the SMDP included care of the newborn and resuscitation techniques in the Essential Obstetric Care updates and distribution of key equipment such as neonatal resuscitation bags and masks, increased availability of oxygen, and a resuscitator for PGH Kakamega. Facilities providing comprehensive obstetric care are able to care for the newborn.



*Clean birthing practices, cord care and early breastfeeding are among the components of ENC*

#### *Mobile clinic/outreach services*

Mobile or outreach clinics provide essential services for pregnant women within the community. The proportion of facilities that had mobile/outreach clinics during the project period improved from 52% to 88% for baseline and endline respectively. This demonstrates an improvement in bringing services closer to where women and children live.

#### *Mobile laboratory services*

Vihiga District developed a model whereby laboratory personnel from the district headquarters travel to rural facilities with necessary equipment and reagents and provide laboratory services to that community and/or facility for that day. Between 2001 and 2002, 10 rural health facilities that did not have laboratories were covered under this pilot.

## **Strengthening referral practices**

The network of referral system is crucial to enabling women with obstetric emergency access appropriate care as soon as possible. Therefore all types of transport and communication needs to be linked.

Across all districts, the bicycle taxi (or *boda boda*) was the most commonly used means of transport to reach health facilities (41%). Other means of transport mentioned were car (27%) and bus/*Matatu* (15%). At the time of emergency referral a number of options are available but they are not necessarily fast (wheelbarrows, home made stretchers, tractors, oxcarts).



*Bicycle taxi (or boda boda) is the most commonly used means of transport*

### *Availability of functioning telephone and vehicles*

By the end of the project period, all hospitals had telephones that worked (increased from 82%) and 71% of rural health facilities either owned or had access to a functional telephone. Significantly more rural health facilities had access to a functioning telephone for emergency communication (from 34% to 42%) and available ambulances at endline (increase from 23% to 31%).

### *Transport arrangements to the referral site*

There were no changes in the proportion of facilities that made transport arrangements to referral sites for obstetric emergencies. Vihiga District recorded a drop in the number of referrals made from 82% to 53%. However, this is attributed to the opening of the new district hospital in the middle of intervention period as well as the improved capacity of health care providers and their institutions to deal with obstetric emergencies following EOC updates. There was also a rise from 64% at baseline to 75% at endline in the proportion of facilities that reported that a nurse or midwife accompanies an emergency obstetric or neonatal referral to the hospital.

There was no significant change in the proportion of women who required emergency referral at their last birth. There was also no change in the time that once the decision was made to refer a woman that transport was found and when she left the facility. Between 40% and 50% of the women were referred in less than half an hour. At baseline, in Kakamega and Bungoma districts, over 15% of the women had to wait for more than 2 hours before being transferred to the nearest health facility. At endline, no patient waited for more than one hour in a referring facility prior to leaving for the comprehensive essential obstetric care centre in all the four districts (see table 7).

**Table 7. Time taken to get to the nearest health facility**

Time (in minutes)	Baseline		Endline	
	No.	%	No.	%
1 –30	45	52	14	41
31- 45	6	8	11	28
46 – 60	21	27	13	31
More than 60	11	14	0	0
Total	83	100	40	100

## **Community Action**

### **Access to and community involvement in maternal care**

#### *Barriers to physical access*

Women cited distance to the nearest facility as a barrier to accessing maternal care. Thirty four percent of women normally take at least one hour to reach the nearest health facility. At baseline 20% of women reportedly never attended ANC due to long distances to health facilities compared to 6% at endline. A small proportion said they never attended ANC due to lack of transport (4%).

Women are dependent on the TBAs because for a long time there was no facility. ( Ndivisi, Bungoma District.)

### *Financial barriers*

The main household expenditure over a period of 3 months preceding both baseline and endline surveys included food, health, education, general household expenses, clothes, farming activities, transport, donations and other expenses e.g. development activities. During the baseline survey, the average household expenditure in Kakamega district was Kshs. 12,018, Vihiga was Kshs. 12,219, Bungoma was Kshs. 8,435 and Lugari was Kshs. 10,301. The average health costs for the three-month period were

"It depends on whether one has casual work - if there is none then one has to rely on the TBAs"  
Male - Vihiga district

between 10% and 16% of the total expenditure. There were no significant changes in spending patterns during the endline survey. When asked to comment on the amount of money spent on healthcare at household level, 59% of women at baseline and 63% at endline rated the expenditure on healthcare as 'too much'. However, 25% of women at baseline and 28% at endline thought the expenditure on healthcare was reasonable while 16% of women at baseline and 9% at endline said they were willing to pay more.

Lack of money to pay for services was therefore evidently an important inhibiting factor for women to access maternal care services. Moreover, there was an increase in the number of health care providers (from 44% to 70%), ANC clients (from 47% to 63%) and postpartum clients (24% to 34%) who cited "lack of money" as an obstacle to seeking care.

Other non-financial obstacles for not seeking care included family and religious objections (6%), no perceived need (22%) and busy in the shamba (3%). During the project period, user fees for ANC services remained relatively constant at an average of Kshs 50. These charges included costs for ANC card, laboratory tests, and medication. Women paid an average of Kshs 580 for a normal birth and Kshs 10,350 for a caesarean section. Facilities reported that, on average, assistance for a normal birth costs Kshs 450. There has been minimal change in the proportion of facilities that indicated that their patients were unable to pay for services (16% at baseline and 12% at endline).

"Charges for delivery at TBAs clinic range from 100/- to 500/- or you pay in kind with a chicken."

An increased proportion of patients benefited from the waiver system (from 59% to 76%) when they were unable to pay for services, and an overall reduction in the proportion of facilities demanding credit with collateral, detaining patients and conducting follow-ups to enforce payment.

### *Results of prepayment schemes*

In one of the sites piloting the prepayment scheme (Matete Health Centre in Lugari District) between 20 and 30 deliveries were taking place each month at endline, compared to the average of 3 per month in 2000. Of the 200 mothers enrolled in the scheme at Matete by 2003, health providers delivered 80% in the health centre and 20% were referred to the sub district hospital in Webuye.

### *Provider attitude*

There were no significant changes among ANC clients who indicated dissatisfaction with the services that they received. Eleven percent of women whose last birth was in a health facility reported that they had had some bad experiences but there was no significant reduction in the reasons given. However a third of these women said that negative provider attitude contributed to their bad experience.

" Health providers need to be provided with skills in humanity" - Vihiga District

### *Improving staff attitude*

To improve health providers' attitude, emphasis was increased on interpersonal communication and counselling (IPCC) skills during the EOC updates run by the SMDP. Overall, the most significant gains concern the fact that clients feel able to discuss the progress of pregnancy with the health care providers (increase from 62% to 77%) as well as being given chance to ask questions (significant increase from 32% to 42%). Client privacy increased from 76% to 85%.

"There were supplies and the facility is very organised. It has older health providers who have peoples needs at heart" - Vihiga District

An increase in the interaction between health providers and pregnant women led to improvements in the knowledge of women on danger signs in pregnancy and childbirth. This also created an opportunity for health providers to assist women especially during childbirth. Significant proportions of women were able to recognise the danger signs of high blood pressure (from 31% to 47%), anaemia (from 31% to 40%) and haemorrhage (37% to 52%).

### *Supplies and drugs*

There has been a 50% decrease (35% baseline to 18% endline) in the percentage of facilities that require mothers in labour to bring gloves, syringes, cleaning liquids and other supplies and drugs. The proportion of facilities that had a sustainable stock of essential obstetric drugs improved over the project period. Data on specific drugs and supplies collected from facilities during the years 2002 and 2003 are demonstrated in Appendix 5. The SMDP was not responsible for procuring drugs but improved the capacity of those responsible for ensuring a consistent essential drug supply. Unavailability of certain drugs is due to gaps in the essential drug kit system delivered by the Central Medical Stores in Nairobi.

### *Dispensary births*

During the baseline survey (2000), only 4 out of the 9 dispensaries visited were conducting deliveries, compared to 8 out of 9 dispensaries visited during the endline survey (2003). These results are consistent with findings from the facility monitoring data, the number of dispensaries conducting deliveries (n= 73) rose from 14% in 2001 to 45% in 2003. Although more dispensaries do provide maternity services there was minimal increase in the number of rural health facilities offering maternity services at night and during weekends.



### *Home births*

The proportion of all births conducted at home by a skilled attendant increased significantly from 1% at baseline to 4% at endline in the four districts. The most notable increase was in Vihiga district where the proportion of skilled attendance at home increased from 1% to 9%. Discussions with the DHMT in Vihiga revealed that the majority of nurses in the district who are employed in the district are expected to be equipped all the time with basic supplies for conducting a delivery such as gloves, cord ligatures, razor blade, soap etc. This may explain the significant rise in results in the district when compared to others.

### *Educating women on danger signs in pregnancy*

There was a significant improvement in the knowledge of the women exiting antenatal clinic on danger signs during pregnancy and childbirth from baseline to endline. More women mentioned signs such as haemorrhage and high blood pressure, which are direct causes of maternal deaths. Despite the overall improvement in the knowledge of the women on danger signs, the proportion of mothers who mentioned obstructed/prolonged labour appeared to have declined from the baseline to the endline period.

### *Birth preparedness*

This model was implemented in Lugari District in September 2002 through community-based groups, members of the Maendeleo Ya Wanawake Organization (MYWO) and the Department of Culture and Social Services for administration and coordination. Following sensitisation meetings 48 women groups across the 28 sub locations agreed to pilot the model. Pregnant women were enrolled into the scheme by women group members and given a brief on the benefits of attending antenatal clinic and skilled attendance at delivery. Each pregnant woman received a birth preparedness card (see appendix), which gives information on how to make a birth plan and be prepared in the event of emergency. Besides birth preparedness cards, the Maendeleo Ya Wanawake Organisation and women groups were also issued with record keeping and reporting forms to record the utilisation of the BP cards by pregnant women. This information was sent to the DHMT. Although this scheme is still new, there were positive signals towards its success. For example, about 5,000 cards had been issued by end of May 2003. At the same time, the district recorded a 33% increase in the number of mothers attending antenatal clinic and deliveries at facilities has increased from 11% at baseline to 32% be endline.

### *Involving TBAs in Referral Practices*

The emphasis in the project has been to build partnerships between health facility staff and Community Owned Resource Persons such as TBAs to refer and where necessary to accompany women in labour to health facilities. Health facility boards and committees devised locally suitable approaches to link the TBAs more effectively with the facility staff. Overall there has been limited change in the number of TBAs escorting women to facilities and referring but individual health facilities have made some impact and have created sustainable working partnerships.

Women's preference for TBAs is usually because of the physical and social access, positive attitude of the TBA, as well as flexibility in the mode of payment.

## Maternal Health Services

### Focused Antenatal Care

WHO and the Ministry of Health now recommend that a pregnant woman should attend comprehensive antenatal care. This is focused care provided to pregnant women, which emphasises the woman's overall health, her preparation for childbirth and readiness for complications (emergency preparedness). It includes a minimum of 4 comprehensive personalised visits spread out during the entire pregnancy during which specific activities are carried out to guide the woman through to a positive pregnancy outcome. Focused ANC should provide the early detection and treatment of complications during pregnancy; health promotion and prevention of disease; birth preparation and complication readiness; and delivery with skilled attendant (see Table 9 for summary).

Over 90% of women said they attended antenatal clinic at least once in their most recent pregnancy. Initial attendance depended on financial capability and if women felt there were no problems during their pregnancy they were more likely to delay attending clinic. Most women interviewed first attended clinic in the third trimester. In Kakamega district, 82% of the women attended for the first time in the third trimester while in Vihiga and Bungoma districts, the proportions were 61% and 59% respectively. In Lugari district slightly more than half (52%) had attended for the first time within the second trimester.

"If there is a problem, women will start attending clinic even as early as the first month but if they have no problem, they relax and go late". Woman from Madzu, Vihiga

However there was no significant change in the number of visits women made to ANC over the project period. The majority of women (over 80%) attended ANC, three or more times throughout their pregnancy. This is consistent with findings across Sub Saharan Africa (WHO/UNICEF 2003). In Western Province the number of women who visited ANC 4 times increased marginally from 55% to 58% between the two surveys (the national target is at least 50%).

### Early detection of disease and treatment of complications

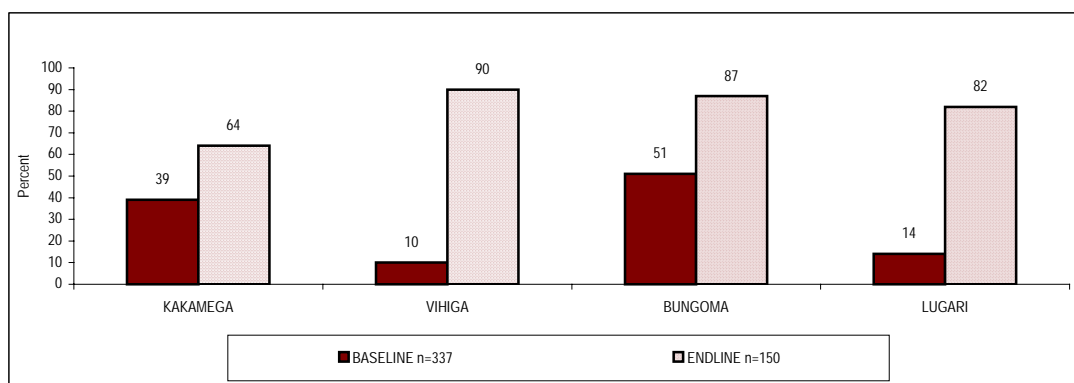
One of the important aspects of antenatal care is screening of blood and urine in order to detect any predisposing conditions. There were significant increases in the number of women who had blood tests to check their haemoglobin, and blood groups. In addition significantly more women had their blood pressure checked. High blood pressure is an early warning sign of pre – eclampsia.

### Prevention of disease

#### *Malaria*

Malaria continues to be a killer among the population in Western Kenya. Pregnant women are more susceptible to the disease especially those in their first pregnancy. According to the National Malaria Guidelines, every pregnant woman living in malaria zones should have two doses of intermittent preventive treatment of Sulphadoxine Pyrimethamine (SP) between 16 and 36 weeks. There was a significant increase in the proportion of women who received both the first and second doses of SP at antenatal clinic. This is a result of improved availability of SP (during 2002 over 95% of facilities in the four districts had stock of SP throughout the year) and the inclusion of focused antenatal care in the EOC updates for health care providers implemented by the SMDP.

**Chart 1. Percent of women who received a first dose of SP at ANC\*\***



\*\* Significant at 0.01 level

Despite the high incidence of malaria in Western Kenya, few women attending antenatal clinic said they slept under a mosquito net the previous night. Only 15% in Vihiga, 21% in Lugari and 27% women in Kakamega said they had slept under a mosquito net. However, 36% of women in Bungoma said they did - this may have been an impact of the Bungoma District Malaria Initiative funded by USAID from 1998 to 2002, which had a focus on malaria in the community. About three quarters (74%) of the women who reported sleeping under a mosquito net had bought it from a shop, 20% from a health facility and the remaining 6% had bought it from a chemist.

#### *Iron and folic acid supplementation*

Women who are anaemic during pregnancy should receive iron and folic acid supplements early to correct their haemoglobin levels. In all the districts, significantly more women received iron and folic acid supplements in antenatal clinic at endline than at baseline. Although there was an increase of women receiving iron and folic acid, the proportions were still below the expected coverage.

Coverage of folic acid in Lugari was only 24%, even though the majority of facilities had the drug as shown in Table 8. The most likely explanation is that women may have been charged for these drugs and this was beyond their financial capability.

**Table 8. Percent of facilities with stocks of SP, iron and folic acid, 2002**

Time in months	Kakamega (n=48)			Vihiga (n=22)			Bungoma (n=40)			Lugari (n=17)		
	SP	Iron	Folic	SP	Iron	Folic	SP	Iron	Folic	SP	Iron	Folic
All the time	71	67	63	56	36	36	78	75	73	82	94	100
6-11 months	23	31	29	23	36	32	17	25	27	18	6	0
< 6 months	6	2	8	23	28	32	5	0	0	0	0	0

At endline 17% of women visiting antenatal clinic had haemoglobin recorded as less than 10.5g/dl indicating anaemia. Of this group, 73% had received the first dose of SP but only 31% received iron supplements.

Things have changed under SMDP, pregnant women are well attended at the health facilities - Makunga HC

## Health promotion and counselling

Significantly more women were able to discuss the progress of their pregnancy and had a chance to ask questions during their interaction with the provider in the ANC clinic. However, there were no improvements in the proportion of women who receive counselling on breast feeding, family planning, care of the mother and her new baby and there was no change in the proportion of women who received a health talk about STIs, HIV/AIDS.

Proportion of pregnant women who discussed where to give birth with provider at endline

Lugari (56%)	Vihiga (59%)
Bungoma (44%)	Kakamega (23%)

### *Advice on where to give birth*

Significantly more women were advised where to give birth with the majority advised to give birth in a health facility. Nurses in Lugari district who work in antenatal clinic were most likely to give advice on the place of birth at 52%.

## Birth preparedness and complication readiness

### *Women's knowledge of danger signs*

In an attempt to find answers to issues that address the first delay, i.e. delay in deciding to seek care for obstetric problems, women were asked about their knowledge on danger signs in pregnancy and childbirth. While women still appear to lack information on some of the danger signs, there were significant improvements specifically in knowledge of haemorrhage and high blood pressure. In Lugari District birth preparedness cards were distributed to pregnant women through MYWO, which has shown an increase in the number of facility deliveries. However there was no significant change in the number of women who reported using one. Table 9 outlines the results of four key aspects of focused ANC.

**Table 9. Improvements in Antenatal care in Western Province**

Antenatal	Baseline n = 337	Endline n = 150
<b>Early detection of disease:</b>		
Early detection of Anaemia: Haemoglobin*	26%	34%
Pre/eclampsia: Blood pressure measured*	68%	79%
Syphilis: VDRL*	18%	26%
<b>Prevention:</b>		
Was asked to come back	94%	94%
ANC attendees receive IPT 1 for malaria**	29%	75%
ANC attendees receive IPT 2 for malaria**	11%	24%
Blood Group **	11%	26%
Iron tablets given*	31%	42%
Tetanus Toxoid	90%	89%
<b>Health promotion and counselling:</b>		
Discussed progress of pregnancy**	77%	82%
Met in privacy	77%	82%
Chance to ask questions*	32%	42%
Median time spent with provider**	8 minutes	10 minutes
<b>Birth Preparation and Complication Readiness</b>		
<i>Client's knowledge of risks/danger signs:</i>		
Haemorrhage**	37%	52%
High BP**	31%	48%
Anaemia/pallor*	31%	40%
No foetal movements*	10%	17%
Abnormal lie*	18%	23%
<i>Place of birth identified:</i>		
Advised where to give birth*	32%	47%
Advised to give birth in facility/skilled attendant	31%	45%

\* Significant at 0.05 level      \*\* Significant at 0.01 level

### Quality of antenatal care

There were no significant changes in client waiting time prior to being attended to. The majority of clients were attended to within half an hour and this was far more likely in Bungoma and Lugari than in the other two districts. Any increase in estimated waiting time can be attributed to the fact that providers were spending more time attending to the clients than they did at baseline. A significant increase was noted in the mean time spent with the health care provider.

There was an increase in the proportion of pregnant women who reported that they had been attended to in privacy, had discussed the progress of the pregnancy and given a chance to ask questions at the endline survey. An inquiry was made about the type of environment in which the clients were seen on the day of interview. At least 60% (65% at baseline and 60% at endline) reported that they were initially seen in the presence of other clients. This includes activities such as weighing and blood pressure measurement. One of the key constraints in the majority of facilities is the lack of space and lack of sufficient staff for antenatal clinics.

However when physical examination took place, (ie palpation of abdomen etc) over two thirds of women said they had been attended to in privacy - from 64% in Kakamega, 76% in Bungoma, 85% in Lugari to 98% in Vihiga. Just over a half of women in Bungoma and over three quarters of women in Kakamega felt they had been told about the progress of their pregnancy compared to over 93% in Vihiga and 91% in Lugari. In Vihiga and Lugari, over half of the women were given a chance to ask questions - compared to less than a third in Bungoma and Kakamega.

### *Financial constraints*

Lack of money (63%), either to pay for transport or the services (range from 50 to 200 Kenyan shillings) emerged as a major deterrent for women to attend antenatal clinic throughout the project period. Similar reasons were cited during focus group discussions. There were no significant changes in why women may not attend although reasons such as negative provider attitude (20%) and preference for the TBA (15%) persist.

### *Client satisfaction with antenatal care*

Clients were asked about their satisfaction with the services they had received on the day of the interview both at the baseline and endline surveys. The satisfaction levels rated the same in both surveys at 84%. Aspects of care that made the clients satisfied included being examined, counselled and given advice by staff who were friendly and gentle, and even being attended to fast. The clients were dissatisfied when their complications persisted, when they had to wait for long before being attended to, and when they did not receive the services they expected.

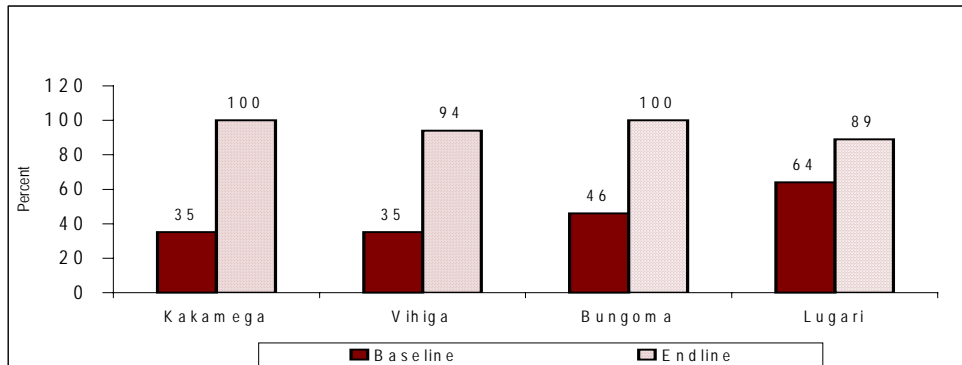


*Many women do not attend clinic unless they are in pain, if not in pain she will not go until she delivers (male - Mihuu, Bungoma District)*

### Antenatal cards

There was a marked improvement in the use of standard antenatal cards in health facilities rising from an overall 42% (baseline) to 97% (endline) as Chart 2 shows.

**Chart 2. Percent of facilities using MOH standard ANC cards**



### Intrapartum care

There is a known discrepancy between the proportion of women who attend antenatal clinic (92%) in the four districts and those who seek birth assistance from skilled attendants and health facilities (30%). The number of births that took place with a skilled health care provider in Western Province increased from 27% to 29% between the two surveys. Although a small increase, some provinces in the KDHS 2003 saw a fall in the proportion of women attended at birth by health care providers. Although there was an increase in number of facility births across the districts the proportion is still low when compared to the proportion of women delivered at home. Table 10 demonstrates the range of assistance received by women who last gave birth within their own homes.

Men would like to be able to hear what advice their wives are given. "...because some come back home and expect big things to be done to them by cheating that the staff of the hospital had said"  
Matete, Lugari district

In Vihiga there was a significant increase in number of women assisted by a skilled attendant at home from 1% at baseline to 9% at endline. In the same period, women giving birth with TBA assistance in Vihiga dropped from 36% to 27%. In Kakamega, and Lugari there was minimal change in the proportion of women attended by TBAs.

**Table 10. Attendants assisting women to give birth in their homes (%)**

Gave birth at home	Baseline (n= 2669)	Endline (n = 942)
Alone	22	24
With relative	24	24
With TBA	53	48
With skilled midwife*	1	4

\* Significant at 0.05 level

### Client satisfaction with care at birth

While 70% of the women gave birth at home (n = 942) during the endline period, 80% of them said they were happy with their birthing experience. Forty percent were comfortable with the assistance given by the TBA and a further 24% felt they had family support. Fifteen percent 'felt safe' and others preferred the low cost (9%) and privacy (8%). Bad experiences for those who had given birth at home were mainly due to the occurrence of complications (46%) and giving birth alone (16%). Of the 30% of women who last gave birth in a facility at endline (n=388), 64% had been treated with respect (up from 50% at baseline) and there was no change in the proportion of providers who explained everything. Bad experiences were attributed to poor provider attitude and disrespectful treatment (13%), relative not being allowed in (12%) and unclean environment (6%).

"At home it can be good or bad: It can be good because you can deliver by yourself. It can be bad when one gets complications. In hospital it can be good because they are skilled and also they have the required facilities."  
(Female respondent Matete Division)

### Competency and skills in providing skilled attendance

In the identification of the cardinal signs of labour there was a significant increase in the proportion of health providers who used cervical dilatation and uterine contractions to establish that a woman was in labour (Chart 3).

The proportion of healthcare providers who reported that they used partographs to monitor labour increased significantly. In Kakamega the increase among healthcare providers was from 18% to 81%, in Vihiga from 25% to 70%, and in Lugari from 10% to 78%. In Bungoma the increase was from 12% at baseline to 42% in the endline survey. Data from health facilities collected during 2002 confirms the above data, which shows that the partograph was used in 88% of deliveries. Generally, over 90% of hospitals and health centres had partographs compared to 31% of dispensaries and 50% of the clinics by December 2002.

Following birth there was a significant increase in the number of health care providers who reported that they usually advise women on infection prevention and nutrition immediately after birth by endline.

**Chart 3** Percent of nurses by signs used to establish labour during the last delivery they attended

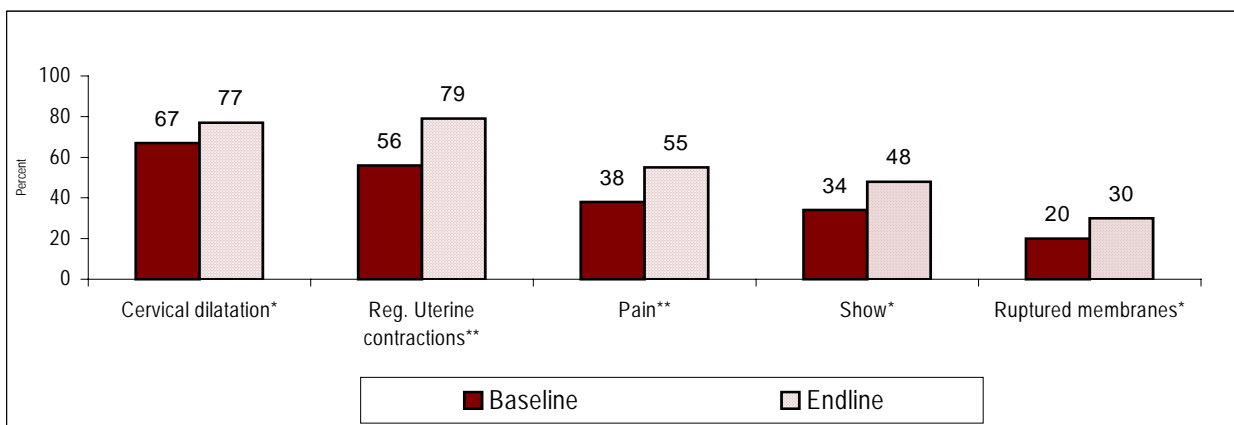


Table 11 describe significant improvements in quality of care provided through health care provider recall. The significant drop in the number of nurses who checked the urine of women in labour was due to the persistent lack of uristix across the province during the project period.

**Table 11. Quality of intrapartum care – health provider recall**

	Baseline	Endline
<b>Provider recall or knowledge and practice:</b>	307	142
Provider assisted at birth within past week**	36%	51%
Use of partographs for managing labour **	17%	72%
<b>Observations taken during labour</b>	230	119
Monitored uterine contractions**	44%	58%
Monitored blood pressure	67%	74%
Monitored temperature*	44%	56%
Checked urine for protein and glucose	7.4%	3%
<b>Advice given to mothers by nurses following delivery</b>	307	142
Nurses advise on infection prevention to mothers**	21%	53%
Nurses advise mothers on nutrition	43%	52%

\* Significant at 0.05 level. \*\* Significant at 0.01 level

Normal labour usually lasts about twelve hours. There was a significant drop in the number of women who were in labour for more than twelve hours – depicting an improvement in the management of prolonged labour. In addition, the administration of oxytocics for proactive prevention of post partum haemorrhage and measurement of blood pressure showed significant improvements. Table 12 describes analysis of patient records for normal birth in facilities.

**Table 12. Quality of intrapartum care – normal birth records**

	Baseline n = 243	Endline n = 214
Admission time to birth 5 to 8 hours**	17%	31%
Admission to birth above 12 hours**	25%	8%
Blood pressure measured 1 – 3 times**	51%	84%
Foetal heart rate observed 5+ times**	21%	54%
Blood loss measurement following birth**	61%	79%
Status of membrane and placenta recorded**	73%	86%
Oxytocics administered following birth **	65%	86%
Blood pressure measured following birth**	35%	76%
Baby's weight recorded following birth*	86%	93%

\* Significant at 0.05 level. \*\* Significant at 0.01 level



## Obstetric complications

The direct causes of obstetric morbidity and mortality are haemorrhage, infection, ruptured uterus, ectopic pregnancy, complications of abortion, and eclampsia. Indirect causes include other medical conditions, which are often exacerbated by pregnancy and childbirth such as malaria, anaemia, TB and HIV/AIDS (see Table 13). Over the project period, health care providers have seen an increasing number of women seeking skilled care for obstetric emergencies.

**Table 13. Health providers experience and management of obstetric problems**

	<b>Baseline N = 307</b>	<b>Endline N = 142</b>
APH **	18%	54%
PPH **	51%	74%
Severe malaria **	24%	49%
Severe anaemia **	45%	66%
Eclampsia **	18%	43%
Sepsis *	11%	20%

*\*Significant at 0.05 level \*\*Significant at 0.01 level*

A significantly higher proportion of providers had seen maternal deaths due to unsafe abortion, obstructed labour and eclampsia by endline.

**Table 14. Major causes of death according to health providers' experience**

Cases of obstetric complications seen in past month:	<b>Baseline N = 307</b>	<b>Endline N = 142</b>
Unsafe abortion**	31%	42%
Obstructed labour**	24%	38%
Eclampsia	15%	18%

*\*Significant at 0.05 level \*\*Significant at 0.01 level*

### *Health Care Providers' knowledge of complications in pregnancy and childbirth*

The health care providers work in units or facilities covering a range of maternal services. However not all of them work in or have worked in a labour or maternity ward unit recently. In addition most patients seeking post abortion care are managed in the female ward, which is separate to the maternity units. Moreover, some of the health care providers updated in Essential Obstetric Care during the project period have now moved to other departments.

The findings are based on health providers' recall of the last patient they managed with the specific problem. Details of the specific signs and actions for the obstetric complications are stated in Appendix 3. The criteria used to develop the composite indicators may appear "strict" given that the improvements while significant are still low as shown in Table 15. However, the criteria include only specific signs and actions that are essential to saving life.

**Table 15. Assessing health providers knowledge and practice in their management of obstetric complications**

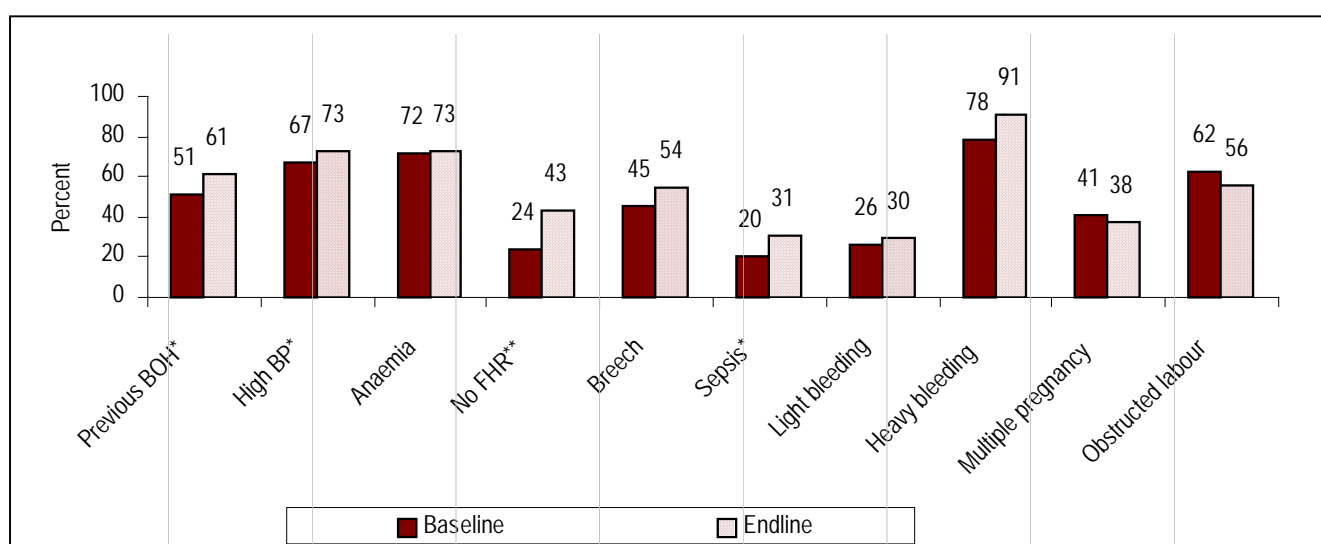
Indicator	Baseline n=307	Endline n=142
Composite knowledge indicator for PPH signs**	2%	15%
Composite indicator for PPH actions **	2.5%	12%
Composite indicator for Abortion**	1.5%	9%
Severe malaria treat with IV quinine and dextrose **	29%	73%
Severe anaemia = Hb, 5g%**	17%	68%

\*Significant at 0.05 level \*\*Significant at 0.01 level

The proportion of staff able to recall the appropriate management of a patient with post partum haemorrhage and incomplete abortion increased significantly. The proportion of nurses who said they would provide MVA more than doubled from 23% to 54% over the project period. There were no significant changes in health care providers' knowledge or recall for composite indicators for APH, retained placenta, eclampsia, puerperal sepsis or obstructed labour, although significant changes were noted in the individual signs and actions for the obstetric complications.

It appears that the knowledge of warning signs of obstetric emergencies during pregnancy, delivery and after delivery by health workers in Western Kenya has improved as can be seen in Chart 4. Significant increases for warning signs to prompt referral included bad obstetric history (BOH), high blood pressure, sepsis and “no foetal heart rate”.

**Chart 4. Percent of providers by warning signs that would prompt a referral**



\* Significant at 0.05 level \*\* Significant at 0.01 level

By the end of the project, healthcare providers were more likely to recognise signs and symptoms of severe anaemia with a significant increase of 53% in the proportion who said that low haemoglobin is indicative of anaemia. Hospital nurses were more likely to recognise marked pallor (92%) than rural health facility nurses (80%). In managing anaemia, just over half of the nurses said they would take blood for grouping and cross matching (51% compared to 36% at baseline). There was a 15% increase in the proportion that mentioned 'drawing blood' to check for malaria parasites at endline.

A higher proportion of nurses in hospitals (89% in Bungoma and 100% in Vihiga) said they would admit a patient with severe anaemia straight away compared to 7% nurses in rural health facilities in Kakamega and 32% in Lugari. However, providers stationed in rural health facilities were much more likely to refer such a patient to hospital (79% in Lugari and 100% in Kakamega), which is the correct way to manage severe anaemia as no rural health facility is able to provide blood transfusion services.

There was a significant increase in the proportion of nurses with correct knowledge of signs for malaria and action (specifically in the use of IV quinine) to be taken in cases of severe malaria. In countries such as South Africa and Zambia there has been an increase in the number of indirect maternal emergencies and deaths due to HIV/AIDS. Currently this information is not available for accurate analysis in Western Province.

In addition to measuring health care providers recall of signs and management of obstetric emergencies, a random selection of patient records were collected from the public, mission and private facilities. Similar proportions of patient records (for normal delivery, obstructed labour, pre-/eclampsia and caesarean section) from hospitals, health centres and dispensaries were reviewed. This information assessed the quality of care given and recorded accurately. Table 16 outlines some of the significant improvements in management of obstructed labour and caesarean section. The number of records for patients with eclampsia was too few to assess for significance.

#### *Caesarean section record review*

The caesarean section record review at baseline and endline provided information on; availability of theatre notes, age and parity/pregnancy distribution as well as the indications for caesarean section, utilisation of the partograph for monitoring the progress of labour, and maternal and neonatal outcome. The partograph was used in 63% of cases requiring caesarean section at endline compared to 16% at baseline. The most common indications for caesarean section were obstructed or prolonged labour and foetal distress. There was no change in the proportion of patient notes recording cervical dilatation of 2–6 cm, normal foetal heart rate and meconium stained liquor at the time of decision to perform a Caesarean Section. However, twenty-nine percent records had no indication at all on the descent of the presenting part at endline.

Overall, there was a significant reduction in the duration of time between when the decision was made to do a caesarean section and the time the actual operation was performed as shown in Table 16. Reasons for a delay of even two hours were mainly due to medical staff shortages - only one doctor covering a whole hospital as the only clinician as well as acting as the Medical Superintendent (e.g. Webuye Hospital).

**Table 16. Improvements in management of obstetric complications**

	Baseline	Endline
<b>Obstructed labour records:</b>	n=78	n = 29
Descent static/contraction more than 3 hours**	52%	97%
Uterine contractions checked half hourly*	51%	71%
Maternal pulse rate monitored	43%	54%
<b>Caesarean Section records:</b>	n = 83	n = 70
C/S performed in one hour or less from decision**	0%	13%
C/S performed more than 5 hours from decision**	10%	0%

\* Significant at 0.05 level    \*\* Significant at 0.01 level

### *Complicated births – obstructed labour record review*

Of the 29 records reviewed at endline for obstructed labour, 72% of the cases were managed using a partograph compared to 34% at baseline (n=78). The main parameters used to evaluate obstructed labour are strong uterine contractions with no progress for 3 or more hours and a static presenting part (no descent). There was significant improvement in the proportion of health providers who had recorded both the uterine contractions and foetal descent and that uterine contractions were checked half hourly and in the proportion of records that monitored the maternal pulse rate. This points to an improvement in diagnosis and management of obstructed labour by providers over the three-year period.

Over 80% of women's records reviewed (both base and endline) indicated obstructed labour as the main reason for Caesarean Section. There was no change in the time taken after the decision to perform the operation to the actual delivery at endline for obstructed labour. With regard to the pregnancy outcomes at baseline, 63 (89%) of the babies were live births. Nearly all, 8 out of the 9 stillbirths were fresh stillbirths and this is attributable to the foetal distress that usually accompanies prolonged labour. There was no maternal death for mothers diagnosed with obstructed labour at baseline. However, one maternal death was recorded at endline. Twenty-four (73%) of the births at endline were live, even though 5 (17%) of them had a poor score.

### *Eclampsia*

Parameters used to review records of patients with eclampsia included blood pressure recordings, proteinuria, eclamptic fits, fluid input and output, and foetal heart rates. Twenty-nine records were reviewed at baseline compared to ten at endline. Fewer women were recorded to have fits, (baseline 15/29, endline 4 /10). More women had their blood pressure measured hourly (Baseline 14/29, End line 6/10) and there was a significant increase in the proportion of foetal heart rates checked (Baseline 10/29, Endline 8/10). The reduced number of women tested for proteinuria from 80% to 30% is due to the concomitant lack of uristix available across districts during 2002-2003.

As regards the maternal and perinatal outcome, the survival rate was 100% at endline with all mothers and their babies discharged alive and well. At baseline, half of the babies were still born and there was one maternal death.

### **Post-abortion care**

Records show that there was an increase in the use of the technique using manual vacuum aspiration (MVA) of retained products of conception. This compares to the more invasive procedure of dilation and curettage, which requires the patient to undergo anaesthesia and to be an inpatient. The proportion of women seeking post abortion care who were managed using MVA procedure increased from 16% (n = 83) to 46% (n = 59) by endline.

Only 13 and 6 post abortion clients were available to be interviewed in hospitals throughout the data collection period, (three weeks and one week during the baseline and endline surveys respectively). An inquiry about the problem that prompted them to go to hospital to seek for medical services established four main causes in order of priority as vaginal bleeding, abdominal pain, foul smelling discharge, and fever and chills. All the post-abortion clients used vehicles to reach the facility at endline.

Once at hospital, such cases should be attended to immediately. In the baseline survey, 5 of the 13 clients received immediate attention for the manual vacuum aspiration (MVA) procedure, but in the endline survey all clients waited for two or more hours before undergoing MVA. All clients experienced varying degrees of pain, with the majority experiencing more pain than expected. A number of the clients did receive family planning information while at the hospital, but this does not appear to have been a routine activity. When asked to express their opinion on the duration they had waited, 7 of the clients at baseline complained that the waiting was too long and all clients interviewed at endline felt the waiting was too long. The majority of the clients felt that the waiting time from examination to evacuation was too long as they waited for a minimum of two hours.

The age range of the patient record reviews shows that the majority of women (71%) were less than 30 years of age from the records reviewed for normal birth. Twenty four percent were less than 19 years of age, 28% were 20 to 24 years and 19% 25 to 29 years as show in Table 17.

**Table 17. Age range of women from case patient records reviewed (by numbers)**

Age range 2003	Normal birth (n = 214)	Eclampsia (n = 10)	Prolonged labour (n = 29)	Caesarean Section (n = 70)
Under 19 years	52	4	14	22
20 – 24 years	60	2	7	20
25 – 29 years	41	1	2	8
30 – 34 years	25	0	3	8
35 – 39 years	15	2	3	8
More than 40 years	5	0	0	1
No age recorded	16	1	0	3

### **Postpartum care**

There was a significant increase in the proportion of women who said they attended post-partum care during the endline 29% (n=1294) when compared to baseline survey 7% (n=3594). If a woman delivers with a skilled attendant she is significantly more likely to attend postpartum care.

Postpartum clients were asked about the services they and their babies had received from health providers since their time of giving birth. During the postpartum visits, mothers are supposed to receive all the services shown in Table 18 with the exception of Pap smear, irrespective of the facility type.

Measurement of blood pressure, performing abdominal examination and enquiring about any abnormal bleeding, were the only services that showed a significant increase between the two surveys. Services for the baby i.e., examination, weighing and immunisation were given most attention as at least 65% of the mothers reported that their babies had received these services.

**Table 18. Type of postpartum service received by mother since giving birth**

Type of service rendered for the mother	Baseline n = 279	Endline N = 97
Measured blood pressure**	36%	53%
Performed abdominal examination**	33%	52%
Asked about any abnormal bleeding**	24%	39%

*\*\*Significant at 0.01 level*

Although there is a noted improved trend where more mothers are receiving care after giving birth, there was no significant change in the proportion of health care providers providing essential care to postpartum women. Specifically there was no change in the providers giving advice on breast-feeding, care of the baby and family planning. From the focus group discussions, it was clear that the discussants understanding of the value of postpartum/post natal services was for the baby and often the health providers did not encourage women to use these services.

Clients were asked to state how long they had waited from the time they arrived at the health facility to the time they were seen by a service provider on the day of interview. The average waiting time decreased from 45 minutes to 40 minutes. The continued length of waiting time may be explained by the fact that if both the mother and baby are examined thoroughly, the other clients will have to wait longer.

Men were not aware that women should attend postpartum "women do not go to clinic it is for the baby"

### Maternal and child mortality

Measuring mortality over a short period of time is challenging, therefore as a proxy, women were asked if they had heard of a woman dying of obstetric complications that year. The proportion of women who had heard of a woman dying because of pregnancy related problems reduced over the project period. At baseline 54% (n= 2157) of women had heard of a woman dying compared to 33% (n = 467) at endline. However more recalled that the maternal deaths appeared to have occurred during pregnancy at endline (an increase from 10% to 23%), but fewer women died during childbirth (reduced from 50% at baseline to 45% endline and after childbirth reduced from 40% to 32%). This increase of deaths during pregnancy may indicate more deaths due to abortion complications although indirect causes cannot be ruled out.

Thirty percent of women (n = 1147) at baseline said they had lost at least one child at baseline compared to 28% (n = 384) at endline. The age of children who had died was not asked at baseline but among women who had lost a child one year or less (n = 112) at endline, 20% said their baby had died at birth, 33% died within the first week, and a total of 36% died within the first month of birth.

## Health organisational and management issues

### Hours of operation

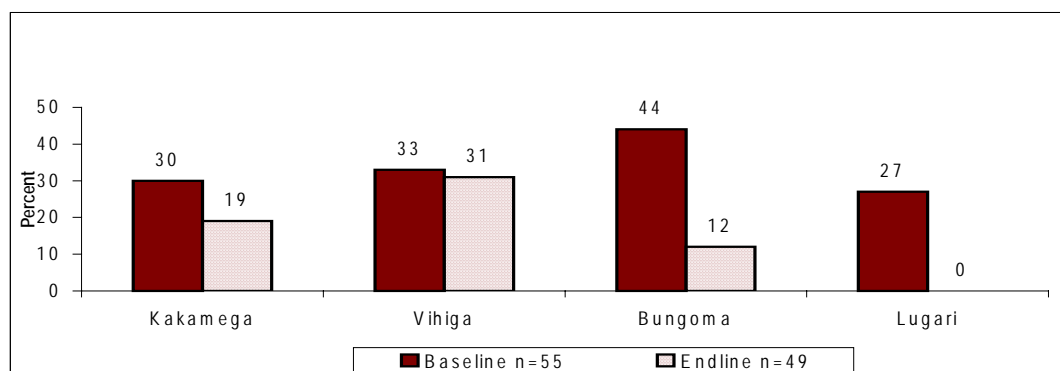
Any facility offering maternity services should operate every day for 24 hours. All hospitals in the project area operated for 24 hours, seven days a week. There were no significant increases in the proportion of Health Centres (82% endline from 60% baseline) and dispensaries (22% endline from 19% baseline), which were operating 24 hours, seven days a week. The proportion of rural health facilities whose outpatient departments were only open during the day Monday to Friday reduced from 17% at baseline to 10% at endline.

Significantly more (85%) facilities had on-call services for complicated deliveries at night and weekends during the endline survey than during the baseline survey (65%). While such increases were evident in Kakamega, Vihiga and Bungoma districts, there was no change in Lugari district where only 33% of the facilities could cater for complicated deliveries at night and weekends. During both surveys, all hospitals (except Kima Mission Hospital in Vihiga district) had on-call services for caesarean section at night and weekends. There was a marked improvement in the number of health facilities that now have organograms (from 39% to 54%) to show the lines of supervision and management.

### *Availability of supplies, drugs and equipment*

Overall, after two years of interventions the proportion of facilities that required women in labour to come along with supplies and drugs reduced significantly. Chart 5 illustrates the drop across the four districts.

**Chart 5. Proportion of facilities requesting women in labour to bring drugs and supplies**



The most significant reductions took place in Bungoma and Lugari districts. The high performance in Lugari and Bungoma districts in supplies may be attributed to active participation of rural health management committees in nearly all facilities which ensure there are no stock outs by buying drugs and supplies locally while waiting for orders from central level.

At baseline there were fundamental gaps in functioning equipment. However, the SMDP distributed basic essential equipment to health facilities through DHMTs. In addition, existing non-functioning equipment was repaired. Following the distribution of “start up equipment”, facilities have been able to procure further items through discussion with their health facility committees and use of facility improvement funds. Moreover other funds are available to the Ministry of Health through the

decentralisation process of Health Sector Reform. Nearly all facilities providing delivery services now have delivery kits. Only 14 out of 45 facilities in Kakamega District and 2 out of 14 facilities in Lugari District did not have delivery kits during endline survey. One of the most pressing gaps that continues to exist is the lack of both adult and neonatal resuscitation kits.

#### *Continuing professional development in obstetrics/midwifery*

Continuing medical education sessions are now the norm in most hospitals. One way of ensuring retention of knowledge is to encourage individuals to prepare a presentation on a given subject for their colleagues or a wider audience. Some of the health care providers have also given presentations at conferences (KOGS 2002, ECSAOGS 2003, NNAK annual conference 2003 etc). Significantly fewer nurses (42%) at endline said they had never received any formal training in obstetrics and midwifery compared to 55% at baseline. Although a greater drop was expected, it is possible that on-job-training (OJT) updates in EOC are seen as informal and therefore “do not count” towards formal training. An alternative explanation includes the recent re-deployment and a number of the 260 providers updated between 2001 and 2002 have retired or have been moved to other departments and replaced with new providers who have not been formally updated in essential obstetric care.

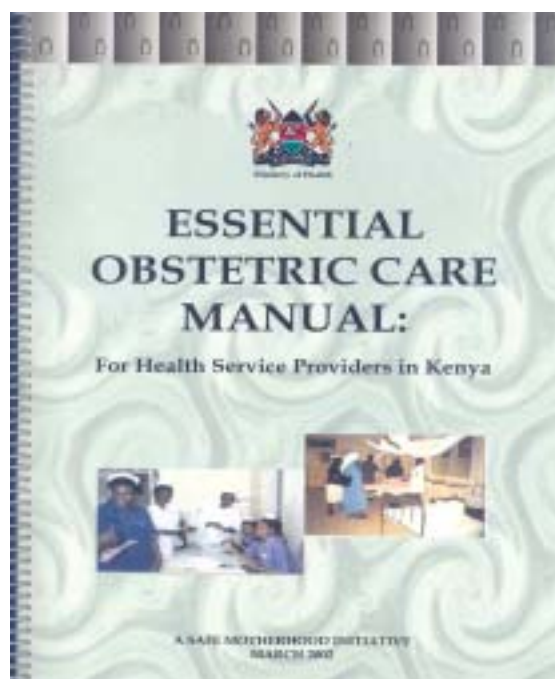
More providers (77%) had received practical skills at the time of endline survey as compared to the baseline survey (61%). From the baseline report, family planning, care of the patient during delivery, and antenatal care were the topics for practical skills updates (on job training). In contrast, the majority of those who received updates at the time of the endline survey related to the conduct of a normal delivery, use of partograph, and handling of obstetric emergencies. There was no change in supportive supervision given to health care providers in the facilities over the project period.

#### *Availability of guidelines or procedure manuals on EOC*

The proportion of providers having access to guidelines or procedure manuals on essential obstetric care increased significantly: from 55% at baseline survey, to 80% at endline. The two main reasons for not having the guidelines (multiple response) were that they were either ‘misplaced’ (84%) and/or ‘not received from supervisor’ (43%).

The most readily available manual at the time of the endline survey was the “Essential Obstetric Care Manual for Health Care Providers in Kenya 2002” (see figure 3), which was not available at all at the time of the baseline survey. Less than 10% of health providers in all four districts had access to the postpartum care manual. Guidelines on risks in pregnancy, unavailable in Vihiga and Lugari districts during the baseline survey, were available at the time of the endline survey.

**Figure 3. Health care procedure manual for health providers at facility level**





### Meetings to discuss patient care

There was no change in the number of health providers (over 80%) who reported that they met to discuss patient care. At least half of the meetings were held on a monthly basis. There was a decline in the proportion of health providers who reported that they discussed difficult cases during the endline survey (70%) compared to the baseline survey (85%), especially in Kakamega, Vihiga and Bungoma districts. Even though maternal deaths were being reported, maternal mortality meetings were not getting the attention they deserved.

Even for perinatal mortality meetings, majority (at least 74%) of the health facilities had never held these meetings. The lowest reporting rate was in Lugari district where only 25% of them held perinatal meetings for every death by the time of the endline survey.

### *Problems in health facilities as perceived by providers*

Health providers considered that the three most important management problems faced by health institutions were lack of equipment and supplies, staff shortage and poor means of transport as shown in Table 19.

**Table 19. Major problems facing health facilities as perceived by providers (multiple response)**

Problem	Baseline		Endline	
	(n=307)	%	(n= 142)	%
Lack of equipment/supplies*		72		61
Staff shortage**		47		68
Lack of transport		30		32

\*significant at 0.05 level    \*\*significant at 0.01 level

The perceived lack of equipment and supplies lessened significantly. On the other hand, the situation on shortage of staff appears worse: -in the past three years there has been no recruitment of new personnel in the health sector except for doctors. Another reason is increased workload, due to additional facilities seeing more clients and providing services for 24 hours as well as an increase in types of services now provided (e.g. FANC, PMTCT/VCT services). The impact of the above problems varied from one district to another. Lack of transport continues to be a major problem in Lugari district while in Vihiga drug shortage is the most important problem. In Kakamega and Bungoma districts, lack of essential equipment was the second major problem.

## DISCUSSION

The discussion that follows addresses components of interventions identified by various stakeholders at district level. The main constraints at baseline were: poor provider competency and skills; inadequate equipment and supplies; inefficient referral system; limited access to community obstetric care; poor health information system; and weak organisational and management system. The SMDP model was developed to address these issues, through four broader elements, which are: skilled attendance, institutional capacity building, strengthened partnerships and community action. If these elements are addressed concurrently this will in turn reduce the three delays and increase utilisation of quality services. An increase in utilisation of services or meeting the obstetric met need will then lead to a reduction in maternal and perinatal morbidity and mortality.

### KEY FINDINGS

#### Antenatal Care

- Increase in use of standard ANC cards
- Significant increases in IPT first and second doses in Antenatal clinic
- Increase in proportion of women receiving blood tests
- More women seen in privacy and given the opportunity to ask questions
- Women spend more time with provider
- Increase in women's knowledge on danger signs

#### Intrapartum Care

- Increase in proportion of partographs used for managing labour
- Increase in knowledge of danger signs among health care providers
- Increase in frequency in health providers assisting at birth
- Increase in measurement of vital signs during labour
- Improvement in management of obstetric complications
- Reduction in number of women in labour for more than 12 hours

#### Postpartum Care

- Increase in number of women attending PPC
- If women deliver with a skilled attendant they are significantly more likely to attend post partum care.

#### Complications

- Obstetric met need increased
- Reduction in Case Fatality Rate
- Increase in facilities providing MVA services for post abortion care

#### Referral

- Increase in access to telephone for referral
- Increase in access to functioning ambulance
- Emergency obstetric cases referred in one hour or less

#### Management

- Increase in number of facilities open 24 hours
- Increase in number of health facilities using guidelines and protocols
- Less women required to bring supplies at time of delivery
- Health facility management improved (organograms)

#### Community obstetrics

- Increase in number of women delivering at home with skilled attendant
- Increase in number of dispensaries providing delivery care
- Prepayment model and birth preparedness models can increase skilled attendance

## Skilled Attendance

One of the key efforts and focus for the SMDP has been on increasing the knowledge and skills of health care providers across the four districts in order to increase the number of women giving birth with skilled attendance. This has resulted in improved knowledge and quality of care and the increasing trend in number of C/S and a reduction of case fatality rate. In addition a supportive environment, which enables the health care providers to work more effectively now exists through the distribution of equipment and supplies as well as supportive supervision.

Overall, more staff received continuing education during the project period although more continuous updates are required given that 58% of staff said they had not received any continuing education at endline. Regular monitoring and supportive supervision are critical elements of management in ensuring that not only set targets are met but also in guaranteeing overall quality of health care at all levels. Staff attitude has improved but remains an issue among women and their families, as many feel helpless to do anything about it. (See box)

"In this world there are two people you do not differ with: you should not differ with the doctor or the magistrate – they have the power to harm you"  
(Vihiga District)

In the provision of focused antenatal care there remain some challenges. The time required to provide a comprehensive consultation, which includes the prevention and early detection of disease, health promotion and birth preparedness is insufficient given the current staff shortages and deployment. However if antenatal care can be improved then it is likely that there will be an increase in use of skilled attendance and postpartum care.

## Institutional Capacity Building

For proper management of obstetric and neonatal complications, a functional referral system needs to be in place. Access to a functional ambulance is essential for facilities to effectively manage obstetric complications and refer appropriately. The number of facilities that had access to transport or were able to call for transport using telephones increased significantly. Moreover while it may be ideal for facilities with major maternity units to have their own facility vehicles it would be more appropriate for an overall review of all health transport needs/vehicles at district level to take place and develop a transport pool that can be accessed swiftly when required.

There was an increase in the number of facilities operating at night and during weekends. Most facilities had procedure manuals and for those who did not have access to them, this was mainly an internal issue and not unavailability *per se*.

Management of health information at facility level improved over the project period. Some districts e.g. Lugari and facilities in other districts took the initiative to develop and print individual patient folders, registers and other stationery. Hospitals and other health facilities were able to improve their patient records and storage as well as compiling their monthly reports following training updates.

The challenge remains for the facility management to ensure regular availability of the partographs and other essential stationery. Due to the improved management systems in procurement and financial control, drugs and supplies were available most of the time. Purchasing of supplies and equipment has now been decentralised to district level.

There was no improvement with regard to holding of maternal and peri-natal mortality meetings, despite there being regular meetings that discussed patient care. These mortality meetings are important as they are meant to reduce future occurrences and should therefore be held on a regular basis.

The majority of women were of the opinion that they spent too much on health care. Waivers and exemptions, put in place by the MoH at the time the 'cost-sharing' was introduced do exist but many women are deterred from seeking skilled care and have no financial capability to pay for the health services. In spite of the MoH 'cost-sharing' guidelines the system remains ineffective in its implementation. Some public health facilities have limited their provision of waivers and exemptions citing declining resources from the central government as a reason for not granting them.

Even in situations where formal fees are low or non-existent, there may exist other costs (including transport, drugs and supplies) that deter women from seeking care. For instance, some women mentioned transport costs as a reason for not attending clinic. This was reinforced during the FGDs with the mothers where they stated that due to the poor economic situation, it was better to spend the money on food rather than spend it as transport and payment for ANC services. Long distances were a handicap in accessing quality maternal care given that 34% of the women normally took at least one hour to reach the nearest health facility.

## Partnerships

Within the SMDP building partnerships was a key strategy to empower all levels of health care and to strengthen linkages between and within institutions. The tripartite approach involving the Ministry of Health, University of Nairobi and Population Council has resulted in an efficient and effective implementation partnership, which is replicable and scalable.

Involving many stakeholders from the districts has resulted in a high level of ownership and subsequently increased likelihood of sustainability. Since the training of health care providers in Essential Obstetric Care, linkages created between the public and mission hospitals have continued. Trainers selected from these institutions remain part of the continuing medical education programme at district level in the form of the Reproductive Health Training and Supervision Teams.

Utilization of facilities has improved where there was good partnership between health facilities and the community. Where health care providers have a positive attitude towards traditional birth attendants, the likelihood of TBAs bringing women to the health facilities increases when problems occur. Some facilities have provided small incentives to TBAs to escort women in labour to the facility and provide psychosocial support during labour. In one rural health facility, the staff helped the TBAs develop performances, which include songs and dancing explaining when women should seek care and how to care for themselves during pregnancy.

## **Community Action**

Lack of a clear policy on the role of dispensaries has been translated into denial of BEOC services for women seeking care in dispensaries. In the past this meant that any woman who turned up at a dispensary for delivery was often referred to a health centre. However as result of the SMDP there has been an increase in availability of services in the peripheral facilities. Domiciliary care has increased significantly indicating a trend to assist women to deliver in the location they feel most comfortable in.

## **Maternal Morbidity and Mortality Reduction**

Evidence from the SMDP has shown that the case fatality rate while not yet less than 1% has started to reduce in the four districts. There has been an increase in number of complicated cases seen and managed and an increase in the number of caesarean sections done for obstetric emergencies. Health care providers are now more likely to see obstetric complications (an indication that more women are reaching facilities in time) and also have improved knowledge and skills to deal with the problems.

Every maternal death is a tragedy. Increased efforts using maternal death review at facility and community level can contribute to learning why these deaths happened and procedures put in place to prevent the same thing happening again.

## **Lessons Learned from the SMDP**

The SMDP adopted a participatory approach in problem identification, analysis and proposing possible solutions by bringing together all stakeholders at all levels. This approach to project implementation was effective in raising morale and increasing levels of commitment and motivation amongst health managers, health providers and members of facility management boards and committees and community representatives. Arising from experiences of the SMDP, some of the lessons learnt are as follows: -

- The Tripartite Approach involving Ministry of Health, University of Nairobi and Population Council has resulted in an efficient and effective implementation partnership, which is replicable and scalable at a national level.
- Use of participatory approach in projects from planning to evaluation enhances ownership and sustainability, and especially when new project activities build on existing management infrastructure.
- Districts are able to organise, on their own, inter-disciplinary support teams to undertake continuing medical education activities such as training in essential obstetric care and as well organize intensive support supervision and follow up.
- Effective management of various resources including human resource deployment, institutional preparedness as well as strengthening basic systems such as health management and information system does improve coverage and quality of health care in facilities.
- While the growth of the private sector has important lessons on how public facilities should be run, staffed and resourced, far too little attention has been paid to effective means of securing better health outcomes from the private sector, or to obtain greater complementarity between private and public sector.

- Public/Private/Mission health facility collaboration involving personnel exchange, sharing of supplies and facilities can ensure 24-hour coverage.
- Emphasis on partograph use reduces third delay and assists staff in rural facilities in deciding to refer in time.
- Postgraduate ObGyn registrars seconded to provincial hospitals can address gaps in specialised care and supervise Continuing Medical Education.
- Inclusion of laboratory technicians, public health officers and health information officers in EOC training improves support to maternal services.
- Considerable barriers to accessing BEOC and CEOC do exist for the poor. Financial barriers to accessing health care remain a major constraint. The current waiver and exemption system does not adequately ensure access for the poor.
- In facilities where there is active participation by community members on the facility committees, referral and utilisation of services improved.
- Effective linkages with community based caregivers (CHWs and TBAs) does increase the number of women with complications being referred in time.
- Individual birth plans distributed by women's groups provides social support as well as raising awareness for seeking care for obstetric complications.
- Information from monitoring and evaluation activities should be used for annual district plans. Only if information is seen as useful will health service staff collect data properly.

## CHALLENGES FOR SCALING UP SAFE MOTHERHOOD AND NEONATAL HEALTH PROGRAMMING

Despite the achievements mentioned within this report, there remain some challenges. These must be taken into consideration prior to any scale up of activities. The following areas require increased focus with the Ministry of Health taking a more pro-active role in the coordination of all aspects of MNH services in order to reduce maternal and neonatal morbidity and mortality.

*Neonatal Care:* Improving maternal care has some impact on improving newborn lives. Health care providers were updated in resuscitation and care of the newborn as part of the EOC updates and resuscitation equipment supplied, however there remain weaknesses in terms of coverage and specifically essential care of the newborn in the community.

*PMTCT:* This was not a focus during the demonstration phase, however some of our partners (FHI, NARESA) were piloting interventions within Kakamega District and elsewhere in Kenya. Increased support to integrate PMTCT within maternal and neonatal services is necessary at all levels.

*Young mothers:* There was no particular focus on adolescent mothers. However data shows that there was increased attention on adolescent health needs. There is now an adolescent RH policy, which should be an integral part in any scale up plan.

*Male involvement:* Results from focus group discussions indicate that men are increasingly aware of the problems their women face during pregnancy and childbirth. Safe motherhood and newborn life will benefit if men are included.

*Postpartum Care:* Although some progress has been made in this area, women do not always receive early post partum care. Nurses appear reluctant to provide this care especially in busy units. Women and newborn babies continue to die within the first week. Increased emphasis must be focused during this crucial period.

*Retaining trained staff in maternal services:* Although SMDP updated 260 health care providers in EOC; many have since been transferred to other units or have retired. A critical mass of providers skilled in midwifery/obstetrics must be maintained within the districts and hospitals to ensure quality maternal and neonatal care. Multiple trainings, which are not, integrated with other essential health service packages pull health care providers away from their stations for too long - a strong CME programme would help resolve this.

*Policy for TBAs required:* In some districts, TBAs are still an important provider of care in the community in some districts. However, an important finding was that where domiciliary care was active the TBAs' role was found to have reduced such as in Vihiga District. A policy regarding the role of the TBA needs to be reviewed nationally.

*Maintaining Quality:* Quality of care is a composite indicator that relies on many inputs and participation of many institutions and departments. The biggest challenge is to generate interest especially at the community level to encourage demand-led services. Evidence has shown that where communities are actively involved in the delivery of health services, utilisation increases.

*Participation:* The participatory nature of the project design (requiring all stakeholders to be involved in problem identification, planning and management) took longer than anticipated. However, the fact that the project was built on existing government, NGO and private sector structures made it more acceptable and realistic. This approach is therefore replicable and sustainable within the constraints of the public health system.

*Community Advocacy:* This is a key area that cannot be ignored. Although the SMDP adapted and distributed a range of IEC materials, not enough reached the women and their families who needed it. Materials written in the vernacular will improve access to essential information to assist decisions regarding care-seeking behaviour to improve.

*Emergency Obstetric Care:* There is still a large shortfall with regard to obstetric met need, caesarean section rate and case fatality rate. Future work in this area needs to take into account the relative contribution of indirect causes (specifically HIV/AIDS, TB and Malaria) of maternal morbidity and mortality.

*Health information system:* The information culture within the public health system is low. Health facilities do not use information at source for planning. HIS nationally needs a strategic review.

*Health sector reform:* In any programme more direct linkages must be made with other essential packages. For example, malaria, integrated management of childhood illnesses, Expanded Programme of Immunisation and HIV/AIDS.

## **Way Forward and Programme Sustainability**

Stakeholders from Kakamega, Vihiga, Bungoma and Lugari districts developed strategies to continue activities grouped under nine themes viz., consolidating achievements made and improving on skilled attendance, strengthening partnerships at all levels, maintaining equipment and ensuring a regular supply of supplies and drugs, regular supervision of staff, rolling out to other districts within the Province, redefining the role of the TBAs, community involvement and sensitisation, institutional capacity building, initiating other reproductive health programmes and involving men in the same. Details of these are outlined in a separate district dissemination report<sup>3</sup>.

Although the RH policy documents in Kenya emphasise the need for equitable coverage of maternal and child health services across all districts in the country, the absence of specific resource allocation criteria in the health sector has continued to undermine this policy intention. This has created gaps in geographical coverage as well as inadequate programme coverage. For example, some districts have very limited donor support while others are overwhelmed with external collaborators. Often external support focuses on individual components of safe motherhood rather than adopting a holistic approach to improving women's health. A holistic approach gives women an opportunity to benefit from the continuum of care from conception, during pregnancy to delivery and the postpartum period including family planning.

The Division of Reproductive Health has therefore, developed a Kenya model for SMNH with members of the Safe Motherhood Working Group (who includes Population Council, KOGS and Dept of ObGyn University of Nairobi) (see appendix 10). This model serves as the basis for any further maternal and neonatal programming in Kenya.

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<sup>3</sup> District Dissemination Report for SMDP August 2003 Population Council



## CONCLUSION AND RECOMMENDATIONS

### Conclusions

It is evident from the results that the project has largely achieved its purpose, which was to increase utilization of quality maternal services in the selected districts. Specifically, the project has made substantial progress in the area of maternal health as well as in the broader health system issues through building partnerships, supporting and strengthening community action, use of skilled attendance at birth and having in place a strengthened and supportive health management system at all levels. Emerging lessons from the project point to the fact that realising improvements requires a systems approach and that the four strategic interventions identified above need to work in a synergistic manner to increase utilisation of maternal services in order to improve maternal health in Kenya especially for poor women.

The decision to build in the issue of project sustainability during the planning and design stages of the programme has resulted in high ownership at district level. Judging from the overwhelming support the project has received from the local community it is evident that the interventions being implemented do address a felt need within the implementing districts.

Aware that the three delays were responsible for the majority of maternal and perinatal morbidity and mortality in the four districts, the project developed a variety of strategies to tackle the underlying obstacles at the institutional level, during referral of patients with obstetric emergencies and at the community level. This was done through provision of direct support to the districts e.g. giving a range of inputs in training, supplies and systems development; identification of models of best practice through operational research and finally, generating useful lessons for wider dissemination and for feeding into policies and national strategies.

In addition the collaboration between Population Council, Ministry of Health and University of Nairobi has resulted in an efficient and effective implementation partnership, which is replicable and scalable. Although there wasn't adequate time to scale up some of the pro-poor strategies such as pre-payment schemes, mobile laboratories, birth preparedness scheme etc to all parts of the demonstration districts, in the long term they will contribute towards achieving improved quality maternal services given the enthusiasm and momentum shown by the districts in implementing these innovations.

### Recommendations

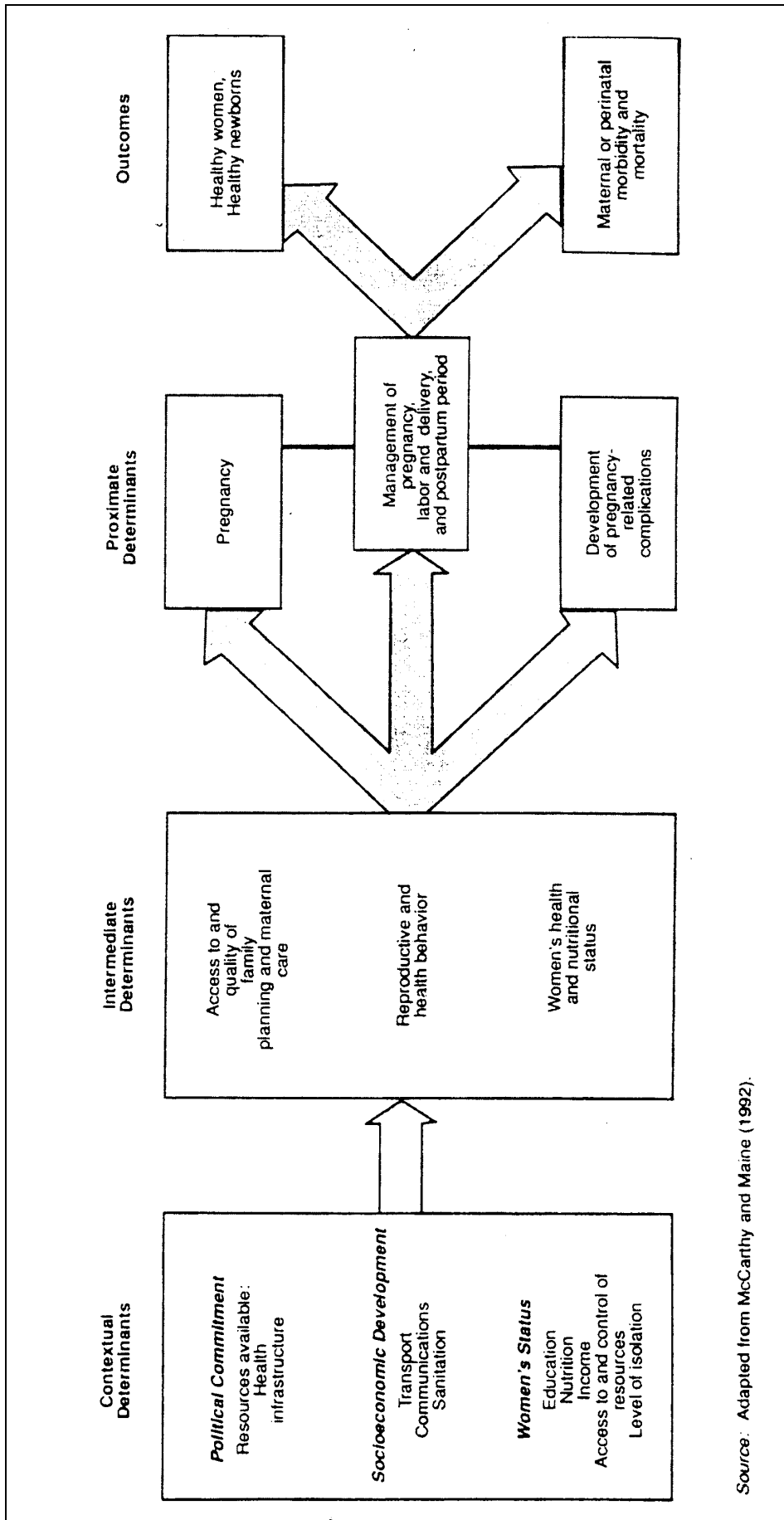
- Ensure effective replication and scale up of safe motherhood initiatives in other provinces in Kenya in line with the Division of Reproductive Health Safe Motherhood and Neonatal Model.
- Strengthen the technical capacity of the Division of Reproductive Health as well as the Provincial Reproductive Health Supervision and Training Teams.
- Incorporate the integrated reproductive health curricula into the basic training courses in all health-training institutions and disseminate evidence based best practice widely, including updates for all trainers/lecturers.

- Safe Motherhood and Neonatal Health is considered one of the essential packages within health sector reform and linkages with the other packages must be strengthened at national level in order to guide linkages at provincial and district level.
- Develop a National RH policy and National Advocacy Strategy for Maternal and Neonatal Health: improve policy clarity and wide communication on making pregnancy safer issues (e.g. a national transitional strategy for TBAs is developed and domiciliary care strengthened).
- Ensure pro-poor systems are in place to provide equitable maternity services country wide

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# APPENDIX 1: SAFE MOTHERHOOD CONCEPTUAL FRAMEWORK



Source: Adapted from McCarthy and Maine (1992).

## APPENDIX 2: DESIGN AND METHODOLOGY

### Study Design

A participatory approach was followed in problem identification and analysis in all the four districts of Kakamega, Vihiga, Bungoma and Lugari. The process entailed bringing together all stakeholders involved in various aspects of Safe Motherhood activities at national level and in the pilot districts. As a start, a baseline survey was conducted in the four pilot districts to provide information on the current status of safe motherhood in these districts. The results from the baseline survey and the recommendations from the internal review were consolidated to form the basis for the interventions adopted, which aimed at improving the quality of care for improved pregnancy outcome. Through a collaborative effort involving the Division of Reproductive Health, the University of Nairobi and Population Council, questionnaires and guidelines for focus groups were developed to address all issues raised by the stakeholders. The then existing strengths, opportunities and constraints were identified and indicators for monitoring project performance established through the use of the logical framework analysis. After two years of implementation, an endline survey was conducted. Results from the baseline and endline surveys were used to assess the effectiveness of the interventions hence providing a basis for possibilities of replicating similar interventions elsewhere.

### Sampling and Data Collection

Both probability and non-probability sampling procedures were used in this study. The selection of study sites was purposeful. Enumeration Areas (EAs) were deliberately selected to provide information about the population in the pilot sites. A combination of sampling techniques were used: (i) systematic sampling was used to identify case files for record review and clients for various obstetric services; (ii) multi-stage cluster sampling for selection of women respondents at household level; and (iii) stratified sampling was used to select administrative divisions within each district.

#### Women at household level

Using the census enumeration areas for 1999 (Republic of Kenya 2001) for the four districts, divisions, locations, sub-locations and enumeration areas (EAs) were listed. Using the total population per division within each district, purposive sampling of divisions was conducted to include proportionate number of divisions with high populations and an equal number with low. For each division sampled, locations were randomly selected. For those locations identified, all the sub-locations within it were included for sampling. Within each sub-location, EAs were picked at random, and all households within an EA formed the wider sampling frame for the household survey.

For each household a list of members from the oldest to the youngest, who usually live in the household, was compiled. Concentrating on females, women in the reproductive age group were identified. Further, all those who had either given birth in the past three years preceding the survey, or were currently pregnant were identified and their consent sought to be interviewed. From the four districts, 276 enumeration areas were selected for the baseline survey. A total of 4,026 women were interviewed in the four districts. For those not found at home during the first visit, two additional revisits were made.

During the endline survey, a narrow range of indicators, were agreed upon with the Ministry of Health at national, provincial and district level. A total of 1,427 were therefore interviewed. This time, the focus was on mothers to children born since January 2001 and females who were currently pregnant.

### **Traditional Birth Attendants**

In each location, a proportionate number of TBAs were randomly selected for the baseline survey using information from the local leaders. Interventions did not target specifically on TBAs. At endline their operations were covered through focus group discussions only.

### **Health institutions**

A list of all health institutions providing any type of maternal care was compiled in each district. While all hospitals (including NGO/private hospitals), health centres and nursing homes were visited; two dispensaries were selected in each district. Eighty-three health institutions (56%) were covered during the baseline survey. The number, which included all hospitals, health centres and two of the most active dispensaries (no nursing homes due to poor availability of data and lack of clients) in each of the four districts, was 59 (40%) during the endline.

### **Health providers**

Every member of staff in a hospital or nursing home working in maternity units or the outpatient MCH/FP and available at the time of interview, was identified by the in-charge of each hospital or nursing home selected. All staff in health centres working in MCH/FP including maternity, and available at the time of the survey, were interviewed. At dispensary level, all providers handling MCH/FP clients/patients on the day the facility was visited were interviewed.

### **Exit clients**

Clients who had come for health services at the sampled institutions (all hospitals and health centres and selected dispensaries) were asked for interview. Due to the minimal number of women who attended nursing homes for antenatal care, delivery and postnatal at baseline, these facilities were not visited in the endline. The client exit interviews targeted clients who had come for antenatal care, postpartum care, and post-abortion care. All post-abortion clients in all facilities visited were interviewed during the two surveys. However, there was a poor response rate and only a few of post-abortion clients were interviewed during the baseline and endline surveys.

### **Record review**

In all hospitals and nursing homes, records in the maternity and labour wards on various modes of delivery during the year 1999 (for baseline) and 2002 (for the endline) were subjected to a review. Records on normal delivery, prolonged or obstructed labour and caesarean section were randomly selected for review (every 10<sup>th</sup>) in order to obtain a sample throughout the year. However due to the low number of women expected to suffer from hypertensive disease in pregnancy, all available records on eclampsia were reviewed for the previous year.

### **Management issues**

All district and hospital management boards and committees were selected for interview in the four districts but only three Health Centre Committees were selected per district. Twenty-one boards and committees were interviewed during the baseline survey.

There were no questionnaires on management issues during the endline survey since such issues were either covered during the monitoring process or through the qualitative component.

### **Focus group discussions**

To supplement data collected quantitatively, views were gathered on health in general and on safe motherhood in particular. Focus group discussions (FGDs) involving young women, adolescent girls and young men were conducted in each of the four districts. Within the sampled locations used for the household interview, villages were sampled to select three focus groups (one each of young women, adolescent girls and young men) in each district.

The FGDs were meant to seek for perceptions and practices of young men and women on issues concerning antenatal, intrapartum and postpartum care. During the baseline survey, additional information collected included: maternal health with a focus on perception of pregnancy, support during pregnancy, available services in terms of accessibility and cost; childbirth/delivery, referral, postpartum care, adolescent pregnancy, pregnancy loss (miscarriage); and sources of information. Through such discussions, adolescent girls expressed their perceptions and knowledge on various RH issues including pregnancy and sexually transmitted infections.

In focus group discussions at the endline survey, the purpose was to elicit views and perspectives of the community based on their experiences with the Safe Motherhood Initiatives that had been in operation over the past two years. Specifically, the discussions sought views on ANC attendance and its importance, choice of site for delivery and relative costs, referral and use of postnatal services. Overall, the discussions were to establish whether there were changes in health service delivery, especially with regard to safe motherhood. Both men and women groups addressed the same themes and were asked to suggest the way forward. Besides the above categories of interviewees focus group discussions were also held with TBAs at endline.

### **Data Analysis**

Quantitative data were coded and edited for completeness and accuracy. Data entry and cleaning was done in Nairobi after which necessary tables were produced for analysis. While the EPIDATA package was used for data entry (including routine monitoring data), analysis was done by SPSS. Using simple frequency distributions and cross tabulations of the quantitative data, the analysis was largely descriptive in nature. Comparison of the data for endline and baseline was done to capture the effect of interventions. Data from monitoring activities was also analysed to show the trend. Qualitative data from the transcripts were typed and then coded before being analysed. Where necessary, the qualitative data were used to explain and expound on some of the quantitative aspects.

### APPENDIX 3: SUMMARY OF PROVIDERS RECALL ON SIGNS AND ACTION REQUIRED FOR OBSTETRIC EMERGENCIES

Sign and action	Baseline (n=262)		Endline (n=139)	
	Single%	Composite%	Single%	Composite%
<b>Signs of APH</b>				
Amount of external bleeding	80	3	89	13
Signs of shock	42		64	
Abdominal tenderness	15		22	
<b>Action for APH</b>				
Refer to doc or hospital	83	3	90	13
Check vital signs	34		45	
Blood for Hb group and X match	28		40	
Set up IV fluid	30		58	
<b>Signs of PPH</b>				
Signs of shock	64	2	78	15*
Amount of external bleeding	68		71	
Uncontracted uterus	31		49	
Retained products/placenta	25		44	
<b>Action for PPH</b>				
Massage fundus	25	2	41	12*
Give ergometrine	54		66	
Empty bladder	18		34	
Start IV	54		66	
<b>Action for retained placenta</b>				
Empty bladder	36	0.4	50	4
Apply controlled cord traction	28		46	
Give oxytocin	10		15	
<b>Signs of obstructed labour</b>				
No descent of presenting part	76	6	87	12
No cervical dilatation	61		65	
Maternal distress	50		57	
Bandls Ring	26		37	
<b>Action for obstructed labour</b>				
Refer/call doctor	91	3	98	12
Start 10% dextrose	28		43	
Continuous bladder drainage	6		14	



Sign and action	Baseline (n=262)		Endline (n=139)	
	Single%	Composite%	Single%	Composite%
<b>Signs of puerperal sepsis</b>				
High fever/ pulse	80	5	91	6
Foul smelling lochia	83		87	
Tender abdomen	44		53	
Septic shock	20		18	
<b>Action for puerperal sepsis</b>				
Give antibiotics IV	79	3	89	9
Examine lochia	26		35	
Start IV fluids	11		23	
<b>Signs of Eclampsia</b>				
Oedema	75	1	81	9
High BP	89		98	
Fits	70		78	
Proteinuria	28		18	
<b>Action for eclampsia</b>				
Start vital signs	44	0.4	38	9
Monitor fluid input and output	16		17	
Administer antihypertensive	33		53	
Administer anticonvulsant	34		51	
<b>Signs of ruptured uterus</b>				
Blood stained liquor	42	3	56	4
Tender lower uterine segment	24		32	
Signs of shock	74		83	
Easily felt foetal parts	36		43	
<b>Action for ruptured uterus</b>				
Treat shock/start IV fluids	39	11	58	12
Monitor vital signs	17		17	
Refer to hospital/doctor	89		94	
<b>Action for incomplete abortion</b>				
Assess bleeding and vital signs	37	1.5	50	9
Start IV and antibiotics	41		66	
MVA	23		54	
Refer	63		54	

Sign and action	Baseline (n=262)		Endline (n=139)	
	Single%	Composite%	Single%	Composite%
<b><i>Action for prolapsed cord</i></b>				
Check pulsation	42	13	59	25
Reduce pressure on cord	49		61	
Prepare for C/S	43		42	
<b><i>Signs of severe anaemia</i></b>				
Shortness of breath	53	0.4	58	38
Marked pallor +++	79		85	
Low Hb (<5g%)	15		68	
<b><i>Action for severe anaemia</i></b>				
Blood grouping and X match	36	0.4	51	1.4
Transfuse	8			
Vital signs	15		19	
Blood slide for MPS	20		35	
Refer	57		58	
<b><i>Signs of malaria</i></b>				
High temperature	80	2	91	4
Coma	13		22	
Pallor	31		48	
Jaundice	19		35	
<b><i>Action for malaria</i></b>				
Admit	54	7	78	19
Vital signs	16		28	
IV quinine and dextrose	29		73	

## APPENDIX 4: COST OF THE SMDP IN WESTERN KENYA

The Ministry of Health and the Population Council initiated the Safe Motherhood Demonstration Project in 2000, with funding from DFID, with the purpose of reducing maternal and perinatal morbidity and mortality in Western Province. Both development and recurrent costs were incurred in this project.

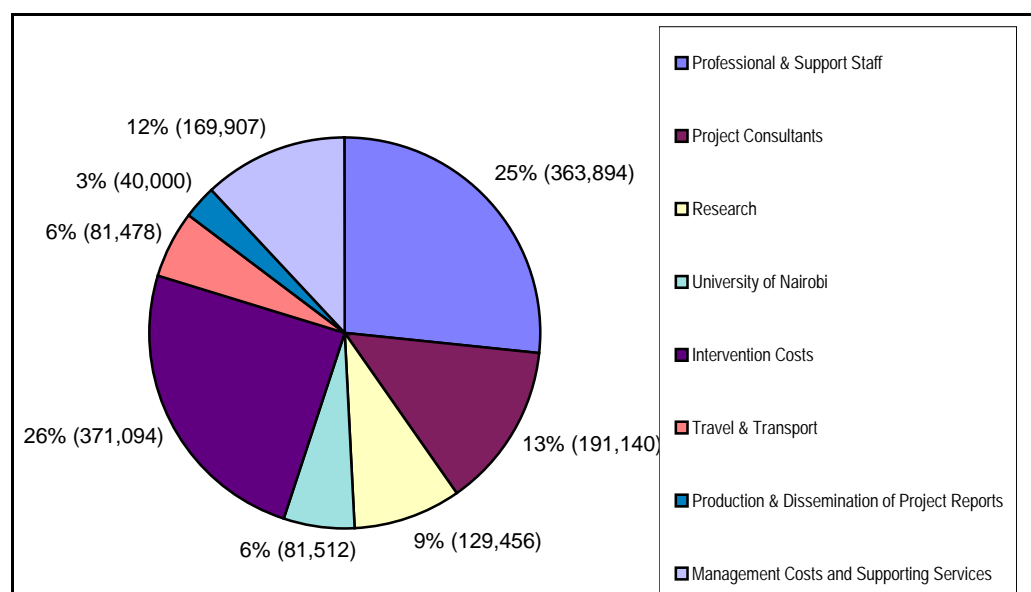
Development costs incurred involved installation of telephone lines, a fax machine (in the PMO's office), purchase of mobile phones, procurement of medical equipment, and production of IEC materials, as well as training in EOC. The recurrent expenditure was for procurement of consumable supplies, payment of utilities such as telephone and fuel, seminars, workshops, on-the-job training and transport operating expenses.

Overall, about US\$1.4 million was used in implementing the project activities during the 2½-year (3 years in Kakamega and Vihiga, and 2 years in Bungoma and Lugari) period. Highlights of the costs incurred by various components during the project period are given below.

### Overall Project Costs

At the end of the project, the total cost incurred was \$1,428,481. Details of the cost breakdown are as depicted in Chart appendix 4.1 below.

**Chart 6** Project costs by activity



Further analysis of the costs for the project is described in a separate document.

## APPENDIX 5: PERCENTAGE OF FACILITIES WITH SELECTION OF KEY DRUGS AND SUPPLIES JAN 2002 TO JUNE 2003

Percent of facilities with drugs and medical supplies						
Type of drug, medical supply	Type of facility	Jan 02	Sep 02	Jun 03	Jan–Jun 02	Jan–Jun 03
<b>Sulfadoxine/ Pyrimethamine</b>	Hospitals	92	100	100	86	98
	Health Centres	86	91	96	84	99
	Dispensaries	98	98	98	95	99
<b>Quinine</b>	Hospitals	83	83	89	70	87
	Health Centres	48	70	75	47	69
	Dispensaries	56	64	60	54	65
<b>Ferrous Sulphate</b>	Hospitals	67	83	89	83	90
	Health Centres	82	84	98	73	92
	Dispensaries	91	100	98	87	95
<b>Folic Acid</b>	Hospitals	83	92	100	80	93
	Health Centres	73	84	100	66	100
	Dispensaries	91	100	98	88	92
<b>Ergometrine</b>	Hospitals	100	100	100	96	97
	Health Centres	93	100	100	90	100
	Dispensaries	78	83	74	77	77
<b>Gentamycin</b>	Hospitals	83	67	89	77	77
	Health Centres	32	47	59	34	58
	Dispensaries	28	34	37	23	31
<b>Flagyl</b>	Hospitals	17	33	0	20	10
	Health Centres	5	2	0	6	2
	Dispensaries	1	2	0	3	2
<b>Amoxil</b>	Hospitals	8	8	0	7	0
	Health Centres	11	2	0	6	0
	Dispensaries	13	2	0	13	3
<b>Ampicillin</b>	Hospitals	58	50	33	52	27
	Health Centres	7	7	9	5	8
	Dispensaries	2	2	0	4	1
<b>Normal saline</b>	Hospitals	92	97	100	94	95
	Health Centres	68	70	72	68	79
	Dispensaries	70	71	77	71	73
<b>Dextrose</b>	Hospitals	92	83	100	86	97
	Health Centres	98	86	86	92	92
	Dispensaries	84	94	83	81	83

<b>Percent of facilities with drugs and medical supplies</b>						
<b>Type of drug, medical supply</b>	<b>Type of facility</b>	<b>Jan 02</b>	<b>Sep 02</b>	<b>Jun 03</b>	<b>Jan–Jun 02</b>	<b>Jan–Jun 03</b>
<b>Penicillin</b>	Hospitals	92	92	89	90	92
	Health Centres	63	84	89	68	79
	Dispensaries	83	89	79	85	85
<b>Reagents for Hb</b>	Hospitals	92	83	100	96	97
	Health Centres	52	65	66	58	64
	Dispensaries	27	58	62	48	59
<b>Reagents for VDRL</b>	Hospitals	100	100	100	100	97
	Health Centres	48	70	66	54	63
	Dispensaries	18	45	59	35	57
<b>Syringes/needles</b>	Hospitals	100	100	100	100	99
	Health Centres	93	98	93	95	95
	Dispensaries	98	100	100	98	97
<b>Gloves</b>	Hospitals	100	100	100	100	97
	Health Centres	98	100	98	98	98
	Dispensaries	98	100	96	98	95
<b>Cotton Gauze</b>	Hospitals	100	100	89	100	99
	Health Centres	82	98	77	87	85
	Dispensaries	96	91	85	95	90
<b>Cord tie</b>	Hospitals	92	100	100	96	98
	Health Centres	89	88	75	89	81
	Dispensaries	67	45	72	70	60
<b>IV Giving sets</b>	Hospitals	100	100	100	100	99
	Health Centres	100	98	84	97	94
	Dispensaries	93	96	74	93	67
<b>Urine dipsticks</b>	Hospitals	50	75	100	59	83
	Health Centres	39	67	41	38	52
	Dispensaries	17	13	30	20	21
<b>Chlorine solution</b>	Hospitals	92	100	100	94	97
	Health Centres	91	95	98	87	98
	Dispensaries	93	96	96	94	97

## APPENDIX 6: LIST OF OPERATIONAL HEALTH FACILITIES BY DISTRICT

Type of Facility	Kakamega	Vihiga	Bungoma	Lugari
<b>Hospital</b>  <i>* Facility was visited during the baseline survey</i> <i>+ Facility was visited during the endline survey</i>	Provincial General Hospital Kakamega *+ St Elisabeth’s Mission Hosp, Mukumu *+	Vihiga District Hospital+ Kaimosi Hospital*+ Kima Hospital*+	Bungoma District Hospital*+ <b>Lugulu Friends Mission Hospi*+</b> Kimilili sub district Hospital*+ Lumboka Hospital* Misikhu Mission Hospital*+ Webuye sub District Hospital*+	Lumakanda Hospital*+ (In name only – functions as a health centre)
<b>Nursing Homes</b>  <i>* Facility was visited during the baseline survey</i> <i>+ Facility was visited during the endline survey</i>	Kakamega Central Nursing Home* Kakamega Highway Nursing Home* Bukura Community Nursing Home* Emukaba Nursing Home* Eshisiru Nursing Home* Glory Nursing Home* Lady Tharau Nursing Home* Maraba Nursing Home* Nala Nursing Home* St. Paulines Nursing Home*	Lundu Nursing Home* Equator Nursing Home*	Chetambe Hills Nursing Home* Elgon View Nursing Home* Mumias Road Nursing Home* Webuye Nursing Home*	Motraco Nursing Home* Matunda Nursing Home* Western Nursing Home*
<b>Health Centres</b>  <i>* Facility was visited during the baseline survey</i> <i>+ Facility was visited during the endline survey</i>	Bukura H/C*+ Bushiangala H/C*+ Bushiri H/C*+ Eregi H/C*+ Iguhu H/C* Ileho H/C* Kambiri H/C*+ Kilingili H/C*+ Malava H/C* Navakholo H/C*+ Shamakhubu H/C*+ Shibwe H/C*+ Shikusa H/C*+ Shiseso H/C*+ Singo H/C	Banja HC*+ Buyangu HC* Ebusiratsi HC*+ Ekwanda HC+ Emuhaya HC*+ Enzaro HC*+ Esiarambatsi HC*+ Givundimbuli HC* <b>Hamisi HC* , Ipali HC*+</b> Kegondi HC Lyanaginga HC*+ Mbale RHTC*+ Sabatia HC*+ Serem HC *+ Tigo HC* Vihiga HC*	Bokoli Health Centre*+ Bumula HC*+ Chwele HC*+ Kabuchai HC*+ Khasoko HC*+ Kibabii HC* Kimalewa HC*+ Malakisi HC*+ Naitiri HC*+ Ndaluh HC*+ Sirisia HC* Webuye HC* Tongaren HC+	Koromaiti H. Centre+ Likuyani HC*+ Mabusu HC* Matete HC*+ Mautuma HC*+

## LIST OF OPERATIONAL HEALTH FACILITIES BY DISTRICT

Type of Facility	Kakamega	Vihiga	Bungoma	Lugari
<b>Dispensaries</b>	Budonga Dispensary. Bukhaya Dispensary Chebwai Dispensary* Emahola Dispensary Ematete Dispensary Ematsayi Dispensary Enanga Disp. Ingotse Disp. Kakamega Forest Disp. Kharanda Disp. Kongoni Disp. Namagara Disp. Sango Disp. Savane Disp.+ Shihome Disp. Shikokho Disp+. Shikusa Disp. Sirwa Disp. Sivilie Disp.	Buyani Disp. Chamakanga Disp. Chavogere Disp. Esirulo Disp. Fudumi Disp. Kavirondo Disp. Likindu Disp.* Musitinyi Disp.+ Nandaya Disp. Shamakhokho Disp. Shiru Disp.+ Tiriki Mission Disp. Vihiga Mission Disp.	Bulondo Disp. Chesamisi Disp. Chesikaki Disp. Chwele Disp. Kamukuywa Disp. Kamusinga Disp. Kaptanai Disp. Kimaeti Disp. Kirima Disp. Kimobo Disp. Korosiandet Disp. Lukhuna Disp. Machwele Disp. Makhonge Disp.* Makutano Disp.+ Mayekwe Disp. Mechimeru Disp.* Milo Disp.*+ Mitua Disp. Muhanda Disp. Mukuyuni Disp. Namwela Disp. Ngwelo Disp. Nzoia Sugar Co. Disp. PP Mills Disp. Sinoko Disp. Sirakaru Disp. Soyasambu Disp. St. Damanio Disp. St. Leos Disp. St. Lukes Disp. Tamlega Disp. Tongaren Disp.	Chekalini Disp.+ Kongoni Disp.*+ Koromaiti Disp.* Lugari Forest Disp. NYS Disp. Nzoia Disp. Sango Disp.* Serenga Disp. Turbo Forest Disp. St. Mary's Mautuma+

\* Facility was visited during the baseline survey

+ Facility was visited during the endline survey

**APPENDIX 7: KENYA SAFE MOTHERHOOD  
AND NEONATAL HEALTH MODEL**





## APPENDIX 8: LISTS OF CO-ORDINATORS, SUPERVISORS AND RESEARCH ASSISTANTS

	CATEGORY	Kakamega	Vihiga	Bungoma	Lugari
BASELINE SURVEY	<b>MOH Co-ordinators</b>	Judith Sitti Pedro Lubale	Jonathan Majan Joyce Lung'aphar	Bilha Lugiri	Eunice Kiiru
	<b>Supervisors</b>	Odylia Muhenje	Emmy Kageha Wycliffe Ngoda	Douglas Waswa	Helen Wanjala
	<b>Research Assistants</b>	Alfred Nyongesa Annita Sisa Irene Namai Jael Olubero Jane Kweyu Michael Namayi Millicent Oluteyo Rosemary Mutakha	Christiaan Adenya Haron Ayugu Jacqueline Kesenwa Joyce Oyangi	Benson Khisa Carolyne Nyongesa Chrisostim Wataka Churchill Seyle Clementina Obonyo David Wafula Elizabeth Makali Eric Walukano James Simiyu Vincent Makokha	Angeline Wambanda Catherine Juma Cleophas Mukhutsi Gilbert Gohole Judith Mukhwami Wesley Kidiavai
ENDLINE	CATEGORY	Kakamega	Vihiga	Bungoma	Lugari
	<b>Supervisors</b>	George Wanzala	Fred Lyani	Jonathan Majan	Amina Baraka
	<b>Research Assistants</b>	Michael Ochieng Dorcas Mutsotso Irene Namai Millicent Oluteyo Patrick Rapando Jacquiline Kesenwa	Wycliffe Ngonda Joyce Oyangi Jerida Angote Kennedy Mwashu Jackline Kivunaga Mary Akoto	Veronicah Echesa Charity Makali Quinto Mukamani Martin Simiyu Josephine Maleya Judith Ngeresa Sophie Ngugi Charles Watitwa	Wesley Kidiavai Paul Welangai John Namisiko Catherine Juma Gilbert Gohole

### List of data processing and data analysis staff

Joel Kuria  
Ben Obonyo  
Sophie Ngugi  
Florence Khakame  
Sarah Mutua  
Pauline Obong'o  
Abigael Imbigu

## **APPENDIX 9: LIST OF CONTRIBUTORS**

### **Ministry of Health**

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### **University of Nairobi**

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Dr. Guyo W. Jaldesa

#### **Department of Community Health**

Dr. Peterson Muriithi  
Dr. Peter Njoroge  
Prof. Joyce Olenja

### **Population Council**

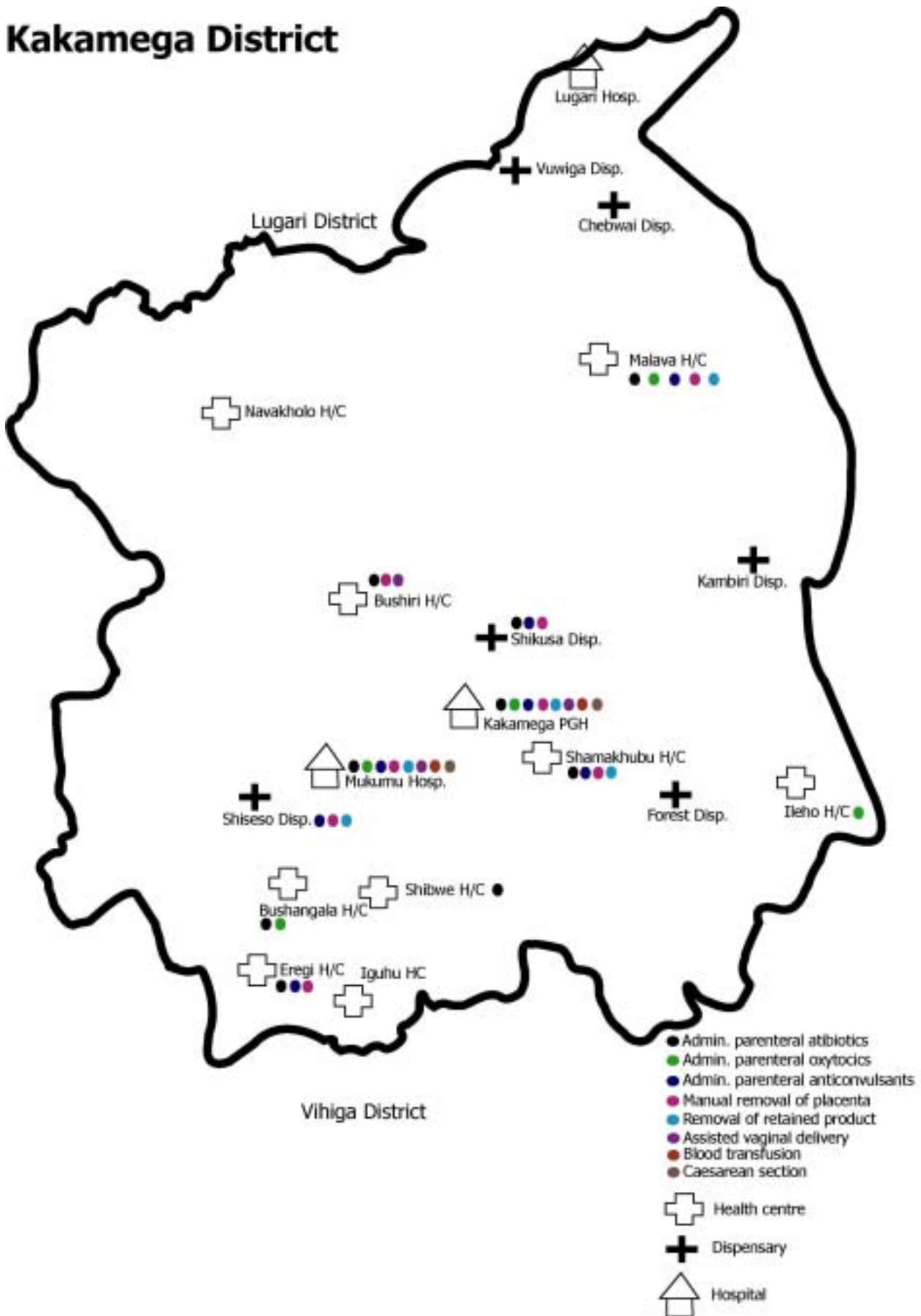
Charlotte Warren  
Wilson Liambila

### **Administrative Assistance**

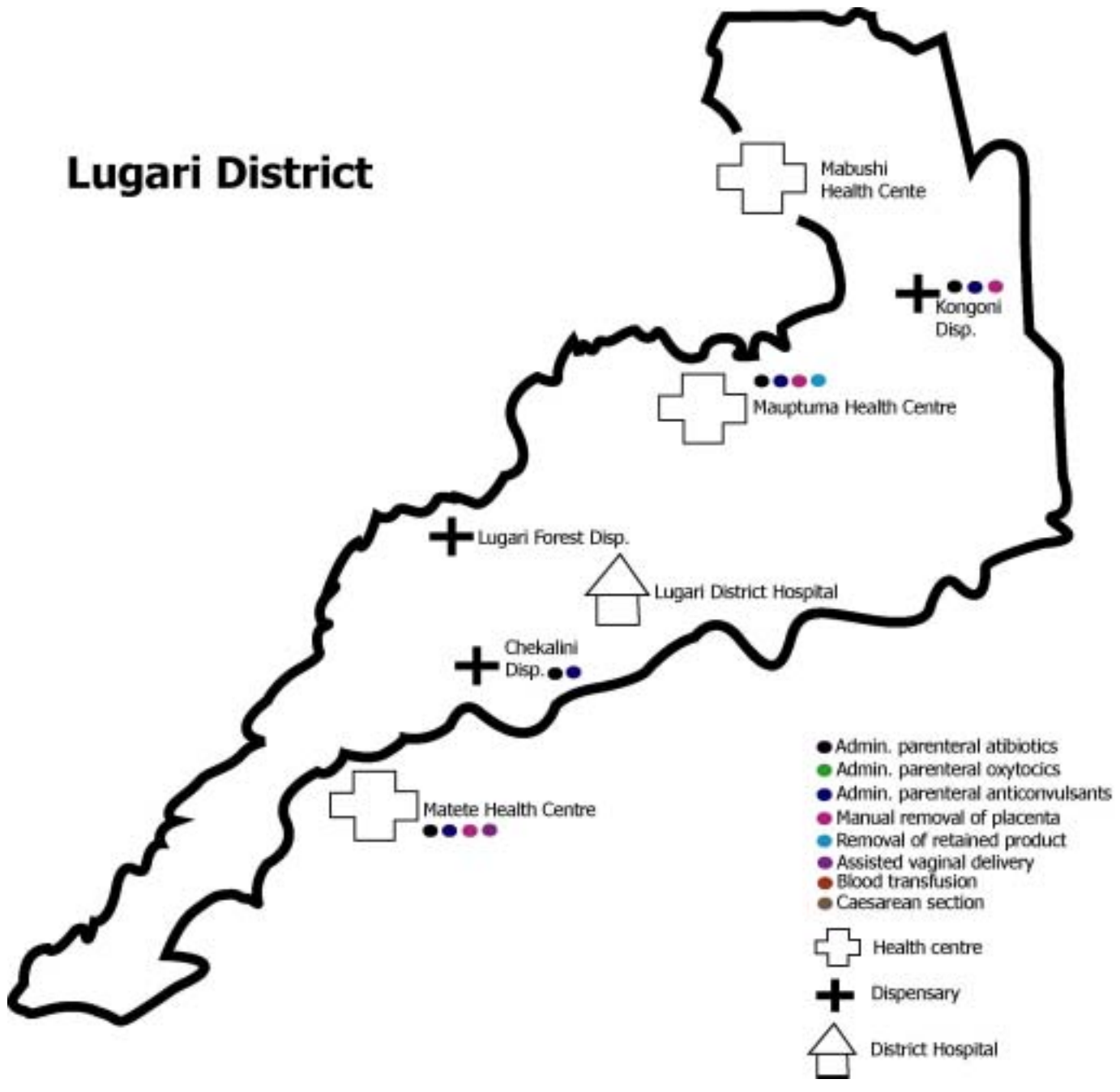
Joanne Lewa  
Diana Mwangi

# APPENDIX 10: DISTRICT MAPS SHOWING DISTRIBUTION OF EOC AND OTHER FACILITIES IN MARCH 2003

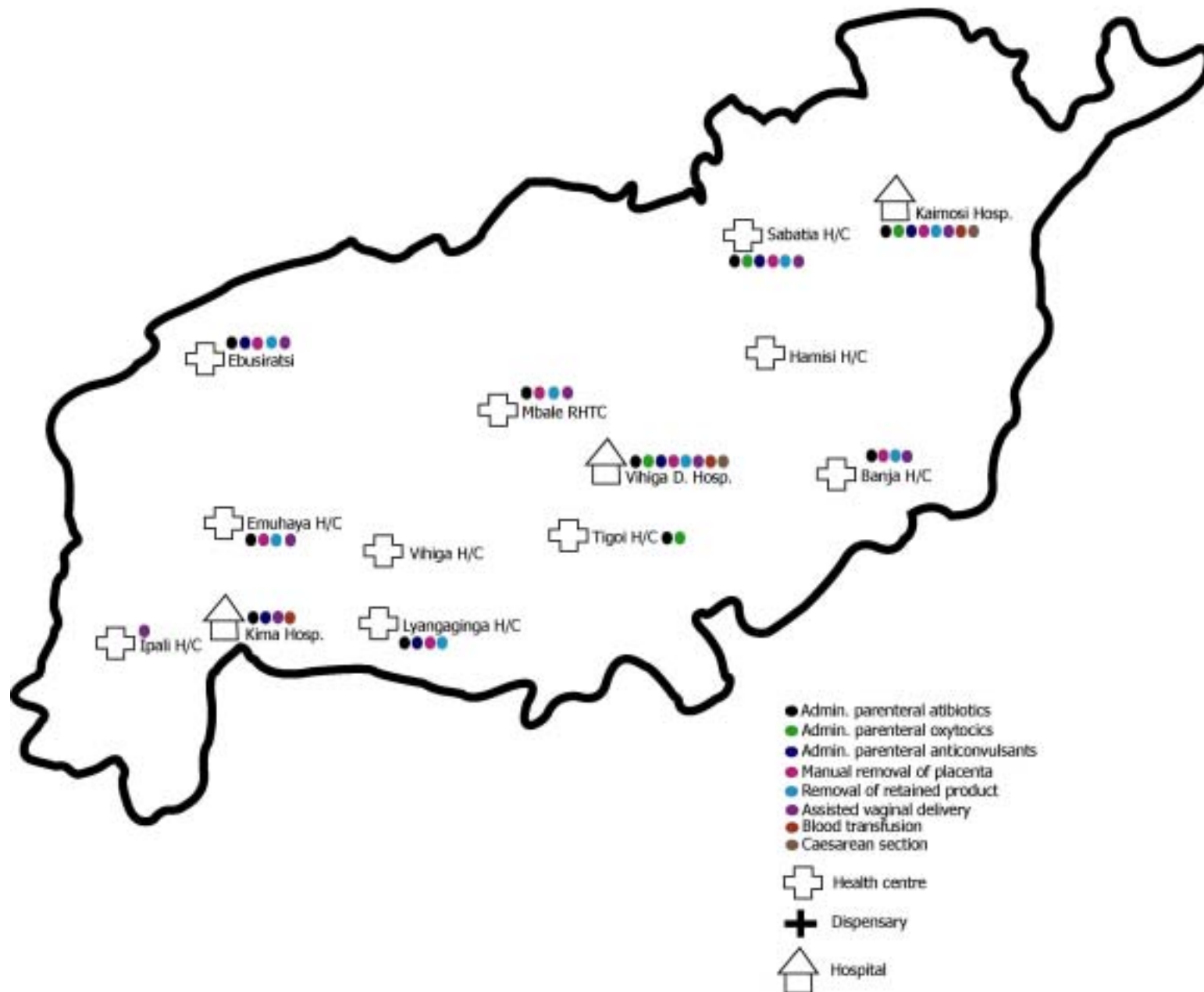
## Kakamega District



# Lugari District



# Vihiga District



# Bungoma District

Population: 955,763  
Sq-Km: 2,069

