

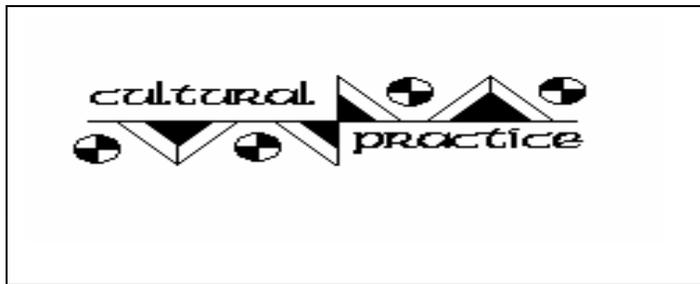
EVALUATION OF THE AVERTING MATERNAL DEATH AND DISABILITY PROGRAM

**A Grant from the Bill and Melinda Gates Foundation
To the Columbia University
Mailman School of Public Health**

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LIST OF ABBREVIATIONS AND ORGANIZATIONS

ACNM	Association of Certified Nurse Midwives - AMDD Technical Partner Organization
AMDD	Columbia University's <i>Averting Maternal Death and Disability Program</i>
BEmOC	Basic Emergency Obstetric Care
CBT	Competency Based Training
CARE	AMDD Implementing Partner Organization
CEmOC	Comprehensive Emergency Obstetric Care
C-section	Cesarean Section
DFID	U.K. Department for International Development
EmOC	Emergency Obstetric Care
EngenderHealth	AMDD Technical Partner Organization
FEMME	Foundations to Enhance the Management of Maternal Emergencies Project (CARE)
FHI	Family Health International-AMDD Technical Partner Organization
HM/HP	Healthy Mother/Healthy Child Project in Egypt
ICM	International Confederation of Midwives - AMDD Technical Partner Organization
IMMPACT	Initiative for Maternal Mortality Program Assessment
IMPAC	Integrated Management of Pregnancy and Childbirth
JHPIEGO	AMDD Technical Partner Organization
JSI	John Snow International -AMDD Technical Partner Organization
LAMM	Latin America and Caribbean Regional Initiative to Reduce Maternal Mortality (PAHO)
LIKHAAN	AMDD Women and Human Rights Project Partner, Philippines
MDG	Millennium Development Goals
M & E	Monitoring and Evaluation
MIS	Management Information System
MM	Maternal Mortality
MMR	Maternal Mortality Ratio
MNH	The Maternal and Neonatal Health Project
PAHO	Pan American Health Organization
RHRC	Reproductive Health Response in Conflict Consortium - AMDD Implementing Partner Organization
RPMM	Regional Prevention of Maternal Mortality Network - AMDD Implementing Partner Organization
SAVE	Save the Children - AMDD Implementing Partner Organization
SENDAS	<i>Servicios para un Desarrollo Alternativo del Sur</i> (Alternative Services for Southern Development) – AMDD Women and Human Rights Project Partner, Ecuador
SNL	Saving New Born Lives Program
T.A.	Technical Assistance
TBA	Traditional Birth Attendant
UN	United Nations
UNFPA	United Nations Population Fund - AMDD Implementing Partner Organization
UNICEF	United Nations Children's Fund - AMDD Implementing Partner Organization
UN P.I.	United Nations Process Indicators
WHO	World Health Organization

One woman dies from pregnancy and childbirth related complications every minute—approximately 1600 per day and over 500,000 per year.

For every woman who dies, 30 more suffer from serious complications and lifelong morbidities.

The million or so children who are left motherless as a consequence of maternal deaths are 3-10 times more likely to die within two years of their mothers' death than those whose mothers survive.

(World Health Organization Fact sheet No 276).

EXECUTIVE SUMMARY

Background

In 1999, the Bill and Melinda Gates Foundation awarded a five-year grant to the Joseph L. Mailman School of Public Health at Columbia University for a program titled “Averting Maternal Death and Disability (AMDD).” The program aims to reduce maternal mortality and morbidity by focusing on critical emergency obstetric care interventions in low resource environments of developing countries through a human rights-based approach. AMDD was designed as an implementation program with no explicit research objectives. Principally, the program provides support and technical assistance to develop the capacity to provide emergency obstetrical care.

AMDD’s principal objective was to shift the paradigm for the implementation of safe motherhood projects from a focus on preventive measures such as antenatal care and community mobilization to improving the capacity of the healthcare system to respond to and resolve effectively the five causes of 72% of maternal deaths (hemorrhage, sepsis, hypertensive disorders, obstructed labor and unsafe abortion) that are not predictable according to risk assessment methods. AMDD’s working hypothesis postulated that focused investments in emergency obstetrical care would more effectively promote policy change than would advocacy efforts alone. The program did not set out to formally test the AMDD approach against others. AMDD was designed as a demonstration program to show how moderate investments in infrastructure (around \$10,000 per facility) in conjunction with human capacity development for healthcare providers in technical procedures and management produces changes in the responsiveness, quality, and utilization of services. The interventions include upgrading of infrastructure, ensuring availability of supplies, training of personnel, and improving technical know-how and management systems for improved infection prevention. Additionally, the program uses UN Process Indicators to assess coverage of maternal health services and to monitor provider performance and maternal health outcomes at the facility level. The original proposal did not delineate explicit research or population-level evaluation objectives, although it did challenge existing assumptions about how to promote policy change.

The program signed agreements with six implementing partners: UNICEF, UNFPA, CARE, Save the Children, the Regional Prevention of Maternal Mortality (RPMM) Network, and the Reproductive Health Response in Conflict Consortium (RHRC). Additionally, Columbia University collaborates with other technical partners, including Barbara Kwast, Family Health International, JHPIEGO, John Snow International, EngenderHealth, the Indian Institute of Management in Ahmedabad (IIMA), and the

International Federation of Gynecologists and Obstetrics (FIGO) to guide, train, monitor, evaluate, and document program activities.

Recently, the AMDD Program submitted a request for follow-on funding of program activities. Before deciding on whether or not it would provide additional support, the Bill and Melinda Gates Foundation decided to evaluate the program's progress and impact to-date and its promise for the future.

The purpose of the evaluation is to ascertain whether the AMDD Program has achieved its objective of shifting thinking on approaches to reducing maternal mortality. It also examines the extent to which AMDD developed, implemented, evaluated, and monitored technological and methodological innovations and approaches to catalyze cost-effective and sustainable changes in health systems to reduce maternal mortality and morbidity.

The evaluation was conducted by Dr. Deborah A. Caro (team leader), an anthropologist with over twenty years of international health, gender, and rural development experience; Dr. Susan F. Murray, a professor of midwifery and medical sociology at Kings College, London; and Pamela Putney, a midwife and public health specialist (CSNM and MPH), with twenty five years of domestic and international experience in the public and private sectors in sustainable health systems, with particular emphasis on maternal and neonatal health. Professor Mahmoud Fathalla (MD), an internationally renowned expert on maternal health, also reviewed the final draft of the report.

A Global Network with Global Reach

The Averting Maternal Death and Disability Project (AMDD), funded by the Bill and Melinda Gates Foundation in 1999, is the first global project to focus on the major factors that directly contribute to maternal death and disability—obstetric complications requiring emergency medical intervention. Most donors shied away from supporting the necessary changes in health services because they assumed it required reform of the entire health system, a daunting and costly prospect in countries with few resources and little functioning infrastructure. The Foundation's decision to fund AMDD was a particularly bold move in this context. AMDD has demonstrated to skeptics that it is possible to take on a section of the healthcare system and to produce change in the way that care is delivered in a short period of time.

It is important to emphasize that AMDD was designed as a large-scale demonstration of a focused approach to saving women's lives rather than as a research project. It was not set up to test a set of hypotheses or assumptions, to estimate their cost effectiveness, or to compare and contrast alternative approaches. Nevertheless, AMDD has helped to substantially shift the focus of maternal health programs to include an emphasis on emergency obstetric services at the national, district and sub district levels. The program has galvanized the attention of health care providers and governments in over two-thirds of countries with the highest incidence and greatest numbers of maternal deaths. It has brought sharply into focus the health system's response to obstetric emergencies. Although there have been many other efforts to address maternal mortality, AMDD is unique in that it worked in 52 countries, of which two are national-level health systems programs (Bangladesh and Bhutan) and five (Afghanistan, Bangladesh, Morocco, Mozambique, and Nicaragua) incorporated the UN Process Indicators into their national health management information systems (HMIS) as a result of AMDD efforts.

With the resources provided by the Foundation, AMDD was able to demonstrate to key multilateral and NGO partners it is possible to design and implement maternity care programs that focused on healthcare facilities. AMDD broke through that conceptual barrier against dealing with the healthcare system by demonstrating it is possible to catalyze systemic change by improving one critical part of the system –i.e. the capacity of a threshold number of health facilities to deliver comprehensive and basic emergency obstetric care (EmOC) services. AMDD redirected the maternal health paradigm of maternal health to

focus on reducing maternal deaths, and presented implementers with a focused and manageable set of interventions.

Overall Assessment

AMDD has had a substantial impact on improving maternal healthcare. After five years of the project and 2-3 years of in-country activity it is too early to expect to demonstrate population level impact on maternal health as a direct result of the program. Documented increases in utilization of health facility based EmOC services of a hundred to three hundred percent in some facilities and timely resolution of obstetric complications with similar levels of reductions in case fatality rates indicate a positive trend. If these trends are sustained over time, it is likely that they will lead to reductions in maternal mortality and serious maternal morbidity, especially in countries that have implemented the program on a national scale, such as in Bangladesh and Bhutan.

One of the AMDD Program's goals was to increase women's access to good quality EmOC services worldwide. Covering more than 179 million people, the 18 major AMDD-supported projects upgraded a total of 159 facilities to provide EmOC services in their project areas over three years (making a total of 387 EmOC facilities in project areas). All project facilities worked to improve the quality of care offered to women with obstetric complications.

In four years, more than 270,000 women with obstetric complications received treatment at EmOC facilities in project areas. Individual projects saw average increases of 144 percent in the number of women with obstetric complications treated from baseline¹ to 2003. Not only were the project facilities treating more women, but fewer of them were dying due to improvements in the quality of care. From baseline to 2003, the case fatality rate² decreased, on average, by 50 percent. In 2003, the average case fatality rate for all EmOC facilities in project areas was 1.4 percent, down from an average of 3.2 percent at baseline.

Reductions in case fatality rates are directly attributable to improvements in the availability and quality of services. Availability of basic emergency obstetric care (BEmOC) in Rajasthan increased 104 percent (26 to 53 facilities) and comprehensive care facilities (CEmOC) increased by 35 percent from baseline in 2000 to 2002. In Bangladesh, CEmOC facilities increased by 44% during the same period. The availability of BEmOC in Bhutan more than tripled what it was at baseline (4 to 14) and the number of CEmOC sites doubled from four to eight. Utilization of services also increased markedly while case fatality rates declined. For instance, in Mozambique, the number of women with complications seeking care in project EmOC facilities more than doubled, case fatality rates declined by 64 percent.

Where interventions are on a smaller scale (e.g., Vietnam, Tanzania, and Peru), there are also promising results, especially in increasing the availability of 24 hour emergency obstetric care within the target districts, but the sustainability of the impacts is less certain without further commitment to scaling up, as the health facilities are tied into a larger health system that may undermine results by withdrawing human and fiscal resources.

Credit for the success of AMDD goes both to its conceptualizers at the Mailman School of Public Health at Columbia University and its implementing partners, who operationalized activities in the field with very promising results and on an unprecedented scale. Columbia provided a vision and a tight focus across diverse settings that held the global enterprise together; the partners took the program concepts and integrated them into wider approaches to programming. What is clear is that the principal focus on

¹ Baseline was either, the year 1999, the year 2000 or a period of 12 months falling in the years 1999 and 2000.

² Case Fatality Rate = Proportion of women treated for obstetric complications in EmOC facilities who died

EmOC, a critical element that has been under-funded and under-emphasized in other programs, has transformed how AMDD partners (international development agencies, NGOs, and governments) design and implement maternal health services. The program has leveraged additional financial resources for EmOC in approximately a third of the countries it worked in.

Despite its seemingly narrow focus, AMDD proved to be much more flexible than previous safe motherhood projects, which tended to be heavily donor driven. The flexibility allowed implementing organizations to design and adapt the program to the specific national and regional contexts in which they work. Overall, flexibility was a major strength of the program, especially when the implementing partners in a country had strong managerial and technical expertise. In countries where managerial and technical capacity was weaker, the lack of more hands-on leadership at times limited the quality and effectiveness of care.

The program also demonstrated that there is considerable value in the partnership relationships that AMDD built, although these could have been more effectively managed. The partnership contributed to widespread dissemination of evidence-based practices, and sharing of approaches and experiences among partners.

Field visits and feedback from partners demonstrated that AMDD is a program that has high impact, high visibility, and is highly regarded by governments, international development agencies, and civil societies. The partnership forged by Columbia University focused the international community on a critical part of the health system that was absolutely essential to reducing maternal mortality.

RECOMMENDATIONS

Recommendation 1: Assume International Leadership on Maternal Health

That the Bill and Melinda Gates Foundation assume a leadership role on maternal health, especially with regard to the ambitious Millennium Development Goal for reducing maternal mortality by 75 percent by 2015.

Rationale for recommendation 1

Its key role in funding AMDD, IMMPACT, and the Healthy Newborn Partnership positions the Foundation to assume a worldwide leadership role in maternal health. As demonstrated by AMDD, the combination of an influential donor, a world-class research institution, and organizations with the implementation and technical operational know-how can go a long way in galvanizing political commitment and leveraging resources for reducing maternal mortality. Without this kind of strong leadership, it is doubtful that the next twenty years will produce any significant change in maternal health outcomes for the poorest women of the world, any more than the last twenty.

Despite the status as one of two millennium development goals (MDG) focused on women, the goal to “improve maternal health” has no single influential advocacy group or donor champion to promote commitment of resources and raise international awareness and interest. One of the principal limitations to maternal health advocacy is the lack of investment in programs to address maternal mortality and morbidity.

The Gates Foundation has taken an important leadership role in the fight to improve maternal health in poor countries. By funding AMDD the Gates Foundation took a bold step at a time that no other donor was prepared to take on the difficult challenge of maternal mortality on such a global scale. That

investment by Gates in the five-year AMDD program has had impressive results. AMDD has now established good conditions—the networks, expertise and enthusiasm and the policy environment—that are necessary to take this further forward. The signs are that continued investment in maternal health can effectively consolidate and deepen existing gains.

Recommendation 2: Convene a State-of-the-Art Summit on Responses to Maternal Mortality

It is recommended that the Foundation sponsor a maternal mortality summit to facilitate a "state of the art" review meeting on state-of-the-art Safe Motherhood & Newborn Health care options and measurement of outcomes. The Summit should include researchers, technical partners, donors, advocacy groups, and implementing agencies to consider the current state of knowledge on what works and why and how can these can be measured within health services and systems approaches to Safe Motherhood, what is currently missing, and what the next research questions might be.

Rationale for recommendation 2

Maternal mortality has not been viewed as a global priority worthy of adequate funding to address the magnitude of the problem. In part this is attributable to lack of consensus on what to do and lack of reliable data to demonstrate what works. In the past few years there is growing consensus on what works (see Gay 2003), but less agreement and research-based evidence on how to accomplish it and how to measure it. AMDD, as well as other programs (e.g., Healthy Mother/Healthy Child and Options), now have much to contribute to elucidating the “how”, and research projects such as IMMPACT can contribute to a dialogue on how to effectively measure outcomes. It is timely to bring together the best thinking on implementation, social mobilization, and measurement.

Recommendation 3: Integrate Research and Evaluation into Foundation-Supported Maternal Health Programs

Additional funding should support maternal health programs that integrate a more explicitly research-oriented and evaluatory approach into the programmatic work, encouraging partners to submit projects that are designed to test approaches toward implementation of EmOC, to compare alternative designs, and to document successes and failures from which lessons can be learned and documented. A similar analytical approach should be taken in policy work.

To maximize impact, while maintaining a powerful focus on EmOC, new programs should address critical obstacles to accessing services, such as inadequate transport, limited communications, lack of community awareness and mobilization, non-functioning referral systems, and other key barriers.

Rationale for recommendation 3

It is imperative that full advantage is taken of the opportunities to learn from the AMDD experience and to use these to better understand what works for whom in what setting. Some of these lessons will be specific to informing future Safe Motherhood policy and programming, and some will be generic lessons for global health movements. This may require bringing in new academic partners and policy experts.

AMDD is a high profile project that is highly regarded by diverse stakeholders with a very positive image worldwide, and it is the only global program aimed at reducing maternal mortality. Continued investment in programs that aim to reduce maternal mortality would allow further improvement and consolidation to occur in the programs started by AMDD, as well as further roll-out in additional countries, and scale-up of AMDD and other programs to influence national strategies. The potential exists for more rigorous comparison of the conditions that support or inhibit progress. Several implementing partners have already leveraged additional resources to support this type of expansion and linkage to other components of maternal healthcare. Continued investment in implementation would also offer the possibility of fuller

evaluation of the EmOC approach using the health outcome indicators and surveillance systems (see recommendations 5 and 6).

Recommendation 4: Incorporate a Focus on Neonatal Outcomes into Maternal Health Programs

In the future, Foundation-funded maternal mortality reduction programs with an EmOC focus should incorporate practices that address a) neonatal outcomes and b) major indirect causes of MMR, such as Malaria, TB, Anemia, and HIV/AIDS (where they are a significant cause of mortality and morbidity). They should also build lateral relationships with other organizations working on these issues (e.g., with the Healthy Newborn Partnership).

Rationale for recommendation 4

Approximately a third of perinatal deaths are due to lack of access to emergency obstetric care and harmful obstetric practices. Therefore there is a strong rationale for addressing maternal and neonatal mortality in an integrated manner to benefit both women and neonates. AMDD is only a partial approach to addressing maternal mortality. The next challenge is to link the approach effectively with other critical elements of maternal health care. In some contexts it will also be appropriate to widen scope to include improving identification of cases and provision of care for women suffering from *indirect* causes of maternal mortality (for example severe anemia and cardiac failure due to malaria).

Recommendation 5: Support Improvements in Maternal Mortality Surveillance Systems

The Foundation should support programs that work toward improving maternal mortality surveillance, linked with entities such as safe motherhood committees and other innovative approaches that will hold facilities responsible for improving outcomes and maintaining high standards of quality of care. The program has an opportunity to build on effective models developed elsewhere (e.g. The Healthy Mother/Healthy Baby Project in Egypt and University of Newcastle's research in Tanzania). Building on their experience with the process indicators, AMDD partners should also contribute to the development and improvement of local and national maternal and perinatal health management information systems (to encompass all area-level maternity services, private and public sector, and to improve monitoring of referral networks).

Rationale for recommendation 5

Good quality population- and local-level data on the causes of maternal and neonatal mortality are essential to effectively addressing and sustaining improvements in maternal and neonatal health outcomes. The use of UN Process Indicators by themselves did not yield adequate information at the local level for resource allocation and the most effective solutions for improving maternal and neonatal outcomes.

Recommendation 6: Promote Collaboration among Complementary Programs

The Foundation should actively encourage increased collaboration among its programmatic and research projects. In the future, the IMMPACT research project, also supported by the Gates Foundation, should take active steps to explore future collaboration with programs like AMDD. Capacity and willingness to collaborate should be a prerequisite of new programs.

Rationale for recommendation 6

The IMMPACT Project will be developing new maternal and perinatal health indicators for measuring the impact of national-level Safe Motherhood programs. Collaboration between a follow-on phase AMDD (or some other program that builds upon AMDD) and IMMPACT opens up the possibility of evaluating the health impact of the EmOC approach which has not been feasible up until now.

Recommendation 7: Promote Equitable Partnerships among Advocacy, Research, and Implementing Organizations

Future programs should move to a more collaborative partnership model and work towards more seamless relationships with the White Ribbon Alliance and with other partners on global activities that will have impact at international, national, and down to the local level.

Rationale for recommendation 7

Given the impressive global reach achieved by AMDD, new opportunities exist to strengthen the ties between international advocacy initiatives and program implementation. Previously the scale of advocacy efforts (e.g., White Ribbon Alliance and WHO) for the reduction of maternal mortality have not had strong and direct links to programs due to limited funding for the types of services crucial for addressing the major causes of maternal and neonatal death. It is important for AMDD to recognize that other groups offer skills and special expertise to complement their contribution. It would be in the interest of both AMDD partners and international advocacy organizations to collaborate in defining mutual interests and promoting effective and proven strategies, greater donor and government commitment, and increased allocation of resources.

INTRODUCTION

“Of all the human development indicators, the greatest discrepancy between developed and developing countries is in maternal health” (World Bank “Investing in Maternal Health”, 2003).

“Unlike HIV/AIDS and some of the complex diseases of the tropics, to conquer maternal mortality no new technologies, medical or therapeutic breakthroughs are needed. Rather, as with the childhood vaccine initiative, the solutions already exist, but they need to be made widely available” (AMDD Proposal 1999).

The Millennium Development Goal (MDG) to “improve maternal health,” the only MDG explicitly focused on women’s health, has an ambitious target to reduce the 515,000 annual maternal deaths by three quarters by 2015. Although reduction in maternal mortality does not depend on the development of new technologies, it does require access to a functional healthcare system. The disproportional burden of death and disease borne by women in developing countries is indicative of dysfunctional and inequitable health care systems. As the five causes ² of 80% of maternal deaths are neither predictable nor treatable without access to facility-based emergency obstetric care, its achievement depends on women’s universal access to responsive, equitable health care systems (Freedman 2003).

The Averting Maternal Death and Disability Project (AMDD), funded by the Bill and Melinda Gates Foundation in 1999, refocused the international community on a critical part of the health system that was absolutely essential to reducing maternal mortality. It is the first global project to directly address the principal factors contributing to maternal death and disability, obstetrical complications during pregnancy and birth. AMDD works in partnership with United Nations agencies and nongovernmental organizations with extensive experience in implementing projects in developing countries. The project is recognized for promoting emergency obstetrical care (EmOC), a neglected critical element of maternal healthcare, providing needed technical expertise, and close working relations with governments and communities.

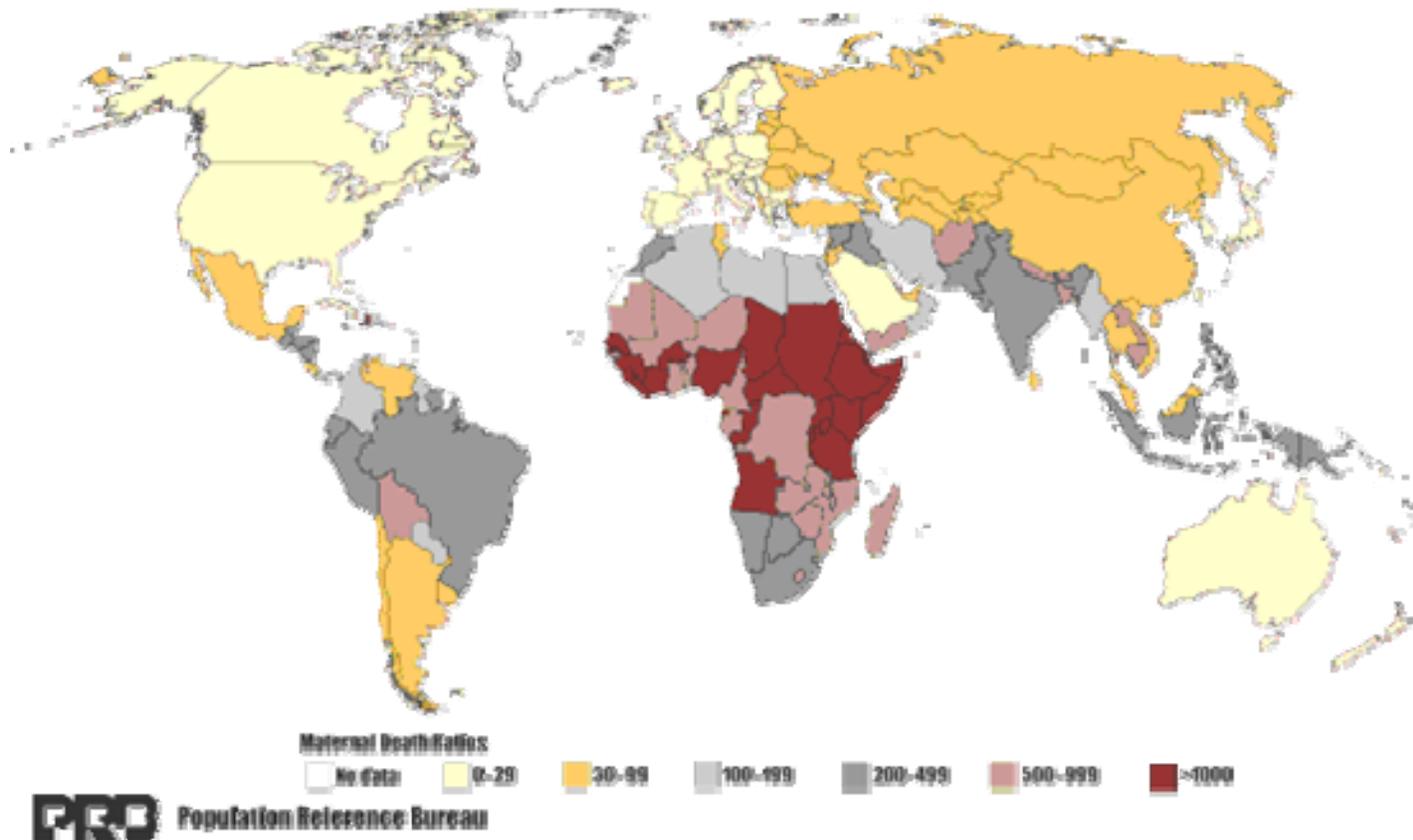
The AMDD Program combines a focus on making emergency obstetric care available with a human rights perspective that argues for a woman’s right to appropriate and quality care. The standards of availability are based on UN Process Indicators that stipulate four basic level facilities ³ and one comprehensive level facility (basic services plus cesarean sections and blood transfusions) for every 500,000 people. The AMDD human rights perspective challenges all governments and healthcare providers to guarantee women access to timely and quality treatment, information, privacy, and respect. It also promotes respect for the rights of healthcare providers regardless of gender, level of training, and ethnicity.

AMDD helped to fill a significant gap in global programming for maternal health. With the focus on making life-saving emergency obstetric care (EmOC) available as part of comprehensive efforts to reduce pregnancy-related mortality and morbidity, the AMDD program enabled its various implementing partners to take a more focused approach to saving women’s lives. Without EmOC, safe motherhood programs cannot significantly reduce maternal mortality. AMDD’s technical, programmatic and financial

² The five direct causes are hemorrhage, sepsis, hypertensive disorders (pre-eclampsia and eclampsia), obstructed labor, and unsafe abortion.

³ Basic level EmOC includes the ability to administer parenteral antibiotics, oxytocics, and anticonvulsants, and the ability to remove placenta manually, to remove retained products, and to perform assisted vaginal delivery.

assistance to implementing partners has greatly improved the quality and effectiveness of maternal health services.



The worldwide scale of the AMDD Project is unprecedented among safe motherhood programs. Proportionally, the resources of the program have been directed to areas of greatest need, with a primary emphasis on South Asia, as well as a presence in a majority of African countries, where one respectively finds the greatest numbers of deaths and the highest maternal mortality ratios. An estimated 529,000 maternal deaths occurred in 2000, of which 67% percent occur in just 13 countries. AMDD has a presence in all of these countries, except two (Indonesia and China). Worldwide, 50% of these deaths occur in South Asia. AMDD has a significant presence in South Asia through their partnership with UNICEF and UNFPA. AMDD has programs in 12 of the 18 countries where the maternal mortality ratio is 1000/100,000 or greater.⁴ No other safe motherhood program has achieved as great a presence in countries where one woman of every 15 or less has a lifetime risk of dying in child birth (WHO, UNICEF, and UNFPA 2000).

⁴ The countries with the highest number of deaths are: India, Nigeria, Pakistan, Congo, Ethiopia, Tanzania, Afghanistan, Bangladesh, Angola, China, Kenya, Indonesia, and Uganda. The countries with the highest risk of death are: Sierra Leone, Afghanistan, Malawi, Angola, Niger, Tanzania, Rwanda, Mali, Somalia, Zimbabwe, Chad, CAR, Guinea Bissau, Kenya, Mozambique, Burkina Faso, Burundi, and Mauritania.

**AMDD COUNTRIES WITH THE HIGHEST NUMBERS AND HIGHEST RISK OF
MATERNAL MORTALITY**

Implementer	Country*	Type of Activity
UNICEF	Afghanistan, India, Nepal, Pakistan, Sri Lanka	Field Projects
	Bangladesh and Bhutan	National Programs
	Benin, Chad, Guinea-Conakry, Mali, Uganda	Needs Assessments
UNFPA	India, Mozambique, Nicaragua	Field Programs
	Morocco	Field Projects/National Needs Assessment
	Cameroon, Cote d'Ivoire, Mauritania, Niger, Senegal, El Salvador, and Guatemala	Needs Assessments
Regional Prevention of Maternal Mortality (RPMM) Network	Angola, Benin, Burkina Faso, Chad, Congo, Cote d'Ivoire, Ghana, Guinea, Kenya, Lesotho, Liberia, Nigeria, Mali, Senegal, Sierra Leone, Tanzania, Togo, Uganda, Zambia, and Zimbabwe.	Regional Field Projects
CARE	Ethiopia, Rwanda, Tanzania, Peru, Tajikistan	Regional Field Projects
Save the Children	Mali, Vietnam	Regional Field Projects
Reproductive Health Response in Conflict Consortium (RHRC)	Kenya, Southern Sudan, Tanzania, Democratic Republic of Congo, Liberia (2), Sierra Leone, Bosnia, Pakistan and Thailand	
Other Women's Rights NGOs	Philippines (Likhaan), Ecuador (Sendas), Nigeria (Center for Women's Health Information), Pakistan (Shirkat Gah)	Human Rights Advocacy Projects
* Red countries are those with a MMR of 1000/100,000 or higher, blue are those countries with the highest number of deaths, and purple are countries with high MMR and high numbers of death		

The allocation of AMDD financial resources also matched closely with the magnitude of the problem in different parts of the world, although more was allocated to Asia than Africa. Fifty-four percent of the subcontract funding was allocated to projects in Asia, 40% was allocated to Africa, and the remaining 6% to Latin America. The distribution reflected the fact that AMDD partnered with the UNICEF Regional Office for South Asia (ROSA) that decided to work in seven South Asian Countries.⁵

Magnitude of Maternal Mortality	Latin America	Africa	Asia
Maternal Mortality Ratio	190/100,000 live births	1000/100,000 live births	280/100,000 live births
Number of Maternal Deaths	22,000	273,000	217,000
Percent of Maternal Deaths	4%	53%	42%
Percent of AMDD Financial Support	6%	40%	54%

⁵Afghanistan, Bangladesh, Bhutan, India, Pakistan, Nepal, and Sri Lanka

DISTRIBUTION OF AMDD FINANCIAL RESOURCES BY PARTNER ORGANIZATION (May 1999- April 2004)

Partner Organization	Latin America	Africa	Asia
RPMM		\$ 4,200,000	
UNICEF-ROSA			\$, 11,000,000
UNICEF-HQ		\$ 252,334	
UNFPA-India			\$ 400,000
UNFPA-Morocco		\$ 1,803,139	
UNFPA-Mozambique		\$ 1,000,000	
UNFPA-Nicaragua	\$ 700,000		
Save the Children-Vietnam			\$ 719,566
Save the Children –Mali		\$ 670,682	
CARE-Ethiopia		\$ 519,700	
CARE-Peru	\$ 629,096		
CARE-Rwanda		\$519,220	
CARE –Tanzania		\$ 663,568	
CARE-Tajikistan			\$ 680,803
Women’s Groups			
• Ecuador	\$ 145,280		
• Philippines			\$ 138,000
• Nigeria		\$ 25,000	
• Pakistan			\$ 250,000
Leadership Grants		\$ 73,600	\$ 250,000
Obstetric Fistula Initiative		\$ 750,000	
TOTAL	\$ 1,474,376	\$ 10,527,243	\$ 14,243,477

The Bill and Melinda Gates Foundation’s decision to fund AMDD was a bold move to support an arena of maternal healthcare—emergency obstetrical services—that most donors were reluctant to fund for fear it required reforming the entire health system, a daunting and costly prospect. AMDD demonstrated to skeptics that it is possible to take on a manageable piece of the health system and produce dramatic results in a short period of time.

AMDD has helped to substantially shift the focus of maternal health programs to include an emphasis on emergency obstetric services at the national, district and sub district levels. The program has galvanized the attention of health care providers and governments in many countries with the highest incidence and greatest numbers of maternal deaths. It has brought sharply into focus the health system’s response to obstetric emergencies. Although there have been many other efforts to address maternal mortality,⁶ AMDD is unique in that it worked in 52 of countries, of which two are national-level programs, and five (Afghanistan, Bangladesh, Morocco, Mozambique, and Nicaragua) integrated the UN Process Indicators into their national health management systems (HMIS).

⁶ For instance, MotherCare I and II, Maternal and Neonatal Health Program, The PAHO Regional Strategy for Maternal Mortality and Morbidity Reduction, DFID, as well as country-specific programs, such as the Healthy Mother/Healthy Child Program in Egypt.

A NOTE ON METHODOLOGY

The evaluation methodology examined seven dimensions of program quality of relevance to this type of global initiative on maternal mortality reduction.

1. **Evidence Base:** The evaluation team examined the AMDD approach in light of the published research on best practice and the historical evidence for what works and what does not contribute to reducing maternal mortality. This entailed both a literature search and an examination of AMDD actions and achievements against recognized best practices.
2. **Geographical and Population Focus:** We examined whether AMDD prioritized countries with the highest numbers of maternal deaths and the highest maternal mortality ratios in order to ascertain if the resources went to the areas of greatest need.
3. **Evidence of High Quality Implementation at Local Project Level:** The team visited eight countries (India, Nepal, Vietnam, Bangladesh, Bhutan, Tanzania, Ecuador, and Peru) to evaluate the results on the ground. We selected countries in coordination with AMDD partners with whom we first met in Kuala Lumpur at the final project conference. We included programs of different size, geographical areas, and implementing partners. The group included two national programs (Bhutan and Bangladesh) and one Women's Group Human Rights program (Ecuador); four South Asian countries (Bhutan, Bangladesh, India, and Nepal), one African Country (Tanzania), one Southeast Asian country (Vietnam), and two Latin American countries (Peru and Ecuador). African countries were underrepresented in our sample due to logistical and time constraints. UNICEF and UNFPA are AMDD implementing partners in South Asia. CARE implements the programs in Peru and Tanzania. Save the Children implements the Vietnam program. During our field trips we traveled with country staff and conducted meetings and interviews with hospital personnel and national, regional, and local government representatives. Where possible, we also spoke with the users of the services, although our access was limited by time and language in most places. It was not possible to conduct in-depth evaluations of each country program.
4. **Evidence of the Breadth and Reach of the Program:** We participated in the final project-wide conference in Kuala Lumpur where AMDD implementing partners presented findings and lessons learned. The Conference provided us a broad perspective on the accomplishments of AMDD across the world. We held focus groups with technical partners (JHPIEGO, EngenderHealth, PRB, ACNM, ICM, and FHI), implementing partners (UNICEF, UNFPA, CARE, Save the Children, RPM, and RHRC), and AMDD Core staff. We met with WHO staff that have closely followed the program. The Kuala Lumpur conference also gave us the opportunity to have many informal conversations with people from countries we were not able to visit.
5. **Evidence of Policy Change and Leveraging of Additional Resources:** Through field visits, oral and written interviews, focus group discussions with AMDD core team and implementing partners, and analysis of project information, the team identified instances where the project had influenced changes in health policies and significantly leveraged additional resources.
6. **Evidence of Lessons Learned and Critical Understanding of Next Steps:** The team formulated the criteria presented in the report used to codify lessons learned and to identify next steps. This was particularly important, as the Foundation has changed its grant-making criteria since the inception of the project. We shared some of these criteria with AMDD staff who were able to pull together much of the quantitative data presented in the report.

7. **Potential for Value-Added through Synergy with Other Programs:** We looked for ways to build on the accomplishments of AMDD and complementary programs funded by the Foundation, such as IMMPACT and Healthy Newborn Partnership.

THE SAFE MOTHERHOOD CHALLENGE

The world needs a war on maternal mortality, and the U.S. could lead that effort. Yet maternal care rarely gets the priority or attention it deserves. Partly that's because the victims tend to be faceless, illiterate village women who carry little weight in their own families, let alone on the national or world agenda.

(Nicholas D. Kristof. "Terror of Childbirth." NY Times, Saturday March 20, 2004, p. 14.

Why Invest in Safe Motherhood?

Investments in maternal health care save women's and children's lives. It contributes to better health, nutrition, and education of children. Investments in essential obstetric services strengthen the entire healthcare delivery system. Facilities that provide quality obstetrical care (includes good infection prevention, safe blood supply, administration of anesthesia and surgery) are also equipped to treat accident victims, trauma, and other critical emergencies. Economic research has demonstrated that investments in maternal health are cost-effective. Those most in need of quality maternal healthcare are poor women in the poorest countries.

Pregnancy and childbirth are the primary causes of death, disease, and disability among women of reproductive age in developing countries and accounts for approximately 18 percent of the burden of disease among this group—more than any other single cause. For every woman who dies of pregnancy and childbirth related causes, three more suffer severe morbidities that limit their capacity to earn a livelihood, participate as citizens, and care for their children. In addition, between 30-40 percent of infant deaths are directly attributable to poor care in pregnancy and childbirth.

Maternal mortality is highest among the poorest women of the world. DHS data from Indonesia provide evidence that a third of maternal deaths occurred among women in the poorest quintile. The risk of death among the poorest women was 3-4 times that of the wealthiest women in the country. Review of DHS from ten other countries demonstrated similar disparities are widespread in developing countries (Graham et al 2004: 23).

Maternal deaths also contribute to the poverty and malnutrition of their families. In many parts of the world, women's income is the primary source of support for children's food, healthcare, and education. The marginal impact of women's income on child survival is 20 times that of men, and eight times larger on weight for height measures (World Bank 2001).

Over the last twenty years, contrary to the trend in many other health indicators, there has been little change in maternal mortality rates (World Bank 2003). Maternal health is not sufficiently prioritized or funded by governments and donors. Some argue that gender inequality contributes both to high rates of maternal deaths and to low investments in providing availability and access to quality healthcare necessary to prevent women from dying. Despite strong efforts on the part of maternal health advocacy groups, important factors constrain political commitment on the part of donors and governments: 1) lack of agreement on what works; 2) perception that effective interventions are too costly; and 3) lack of reliable and accessible indicators to measure impact.

Increasingly, there is consensus among maternal health experts that access to emergency or essential obstetric care is critical to reducing maternal mortality. Safe Motherhood requires a functioning healthcare system that supports the critical elements of care—the right drugs, technology, and skilled providers. While it is to be hoped that research in technological and pharmaceutical innovations may advance the ability to save mothers' lives still further, any new technologies can have little impact without a functioning healthcare system in which they can be used. Future research is needed on the relative impact and cost-effectiveness of different strategies to make essential care both available and accessible.

The 1993 World Bank World Development Report stated that maternal health services are among the five most cost-effective interventions in low-income countries, costing \$60 per DALY and averting 3% of the disease burden. This compares favorably with other investments such as family planning, which costs \$100 per DALY and averts only 1% of the disease burden (cited in Ensor 1999).

Once of the major constraints to funding maternal health programs was the skepticism on the part of donors of being able to demonstrate the impact of their investments (Graham 2002: 2). The development of cost-effective and reliable indicators and the implementation of sound surveillance systems continue to be challenges to measuring the impact of programs on reducing maternal mortality.

“The inadequate resources provided to safe motherhood are both a cause and an effect of inadequate data with which to prioritize, plan, implement, and sustain intervention strategies. The comparative lack, until recently, of large-scale programs [such as AMDD] attempting to address maternal mortality means that there have been few opportunities to look for impact” (Graham 2002: 4).

The Bill and Melinda Gates Foundation-supported IMMPACT Project aims to develop methods and tools for measuring outcomes. Its success is likely to be limited by the small number of maternal health programs on which to test the validity and feasibility of the indicators and data collection methods under a variety of conditions and contexts. Donor support for direct programmatic interventions for reducing maternal mortality and for development of better measurements and surveillances systems are both essential and mutually reinforcing.

What Works?

Safe Motherhood programs are based on the assumption that high quality maternal health services can reduce maternal mortality (Koblinsky et al 1999). This assumption that maternity care services are critical to making a difference is supported by historical data on the timing of maternal mortality declines which suggest that such declines have not coincided with socioeconomic gains, but with improvements in specific services (Louden 1991, Papiernik 1995). The challenges therefore center upon determining which elements of maternal health services are most effective and how they can be put in place.

In ground-breaking work in the 1980s and early 1990s, Deborah Maine and her colleagues at Columbia University challenged the assumptions behind accepted strategies of maternal health programs. They demonstrated that most obstetric complications could not be reliably predicted and questioned the logic behind the risk approach to antenatal care and the training of traditional midwives. They argued that such interventions would be ineffective in the prevention maternal mortality in developing countries in the absence of the provision of accessible emergency obstetric care.

There is now accumulating evidence to support the arguments that improvements in the capacity of the health services to provide timely and high quality responses to complications during pregnancy and childbirth are key to the reduction of maternal mortality. Recently, some large-scale cross-national

regressions for maternal mortality have been performed to ascertain which maternal health services are associated with reduced maternal mortality (Bulatao & Ross 2003).

Shiffman's analysis (2000) showed that the proportion of women reported to be receiving trained assistance at childbirth was a significant factor in regressions across 64 countries, whereas the proportion receiving antenatal care was not. Other significant factors were female secondary school enrollment and health expenditures as a percent of GNP. Sloan et al (2001) had similar findings along with a significant association with contraceptive prevalence. However, as Sloan et al argue, skilled attendance at births is so closely linked to potentially confounding factors, such as education and the availability of transport for emergencies, that the actual contribution of skilled attendants to lower maternal mortality cannot be definitively established.

Most recently, Bulatao and Ross (2003), used indices of the adequacy of maternal health services obtained from local expert ratings on an 81 item questionnaire for 49 developing countries. They found per capita income to have a significant effect, but trained attendant at delivery did not. Instead, their analysis suggests that access to treatment for pregnancy complications and to services that help avoid pregnancy and birth is most closely related to lower maternal mortality.

The Challenges of Measuring Program Impact on Maternal Mortality

Maternal deaths in developing countries are notoriously difficult to measure for three key reasons. They are: 1) under-reported; 2) misclassified; 3) complicated to calculate. In most developing countries vital registration systems are not fully operational, especially in rural and disadvantaged areas. Therefore many deaths, especially maternal deaths go unreported. Furthermore the causes of death are rarely tracked accurately, so even when maternal deaths are recorded, the cause of death is not necessarily attributed to pregnancy or childbirth. Because maternal death is a relatively rare event in any one locality, the current methods for collecting information on maternal mortality ratios depend on large population-based surveys or censuses and retrospective recall on the part of relatives. An additional complication is lack of clarity on whether we know what reduces maternal mortality at the population level, which is a different issue from understanding how to prevent one woman from dying (Graham 2002:3).

Knowing that a particular procedure or drug is efficacious in the controlled and artificial context of a randomized trial is not, of course, the same as knowing that it can be provided effectively and cost-effectively to reduce maternal mortality in a real world population with real resource constraints. Moreover, these interventions are not delivered singly but rather as packages of care or strategies. It is this aggregate level – for strategies and whole populations – that governments and donors need to be persuaded of benefit. Monitoring process indicators remains crucial to implementing these strategies, but without any rigorous demonstrations of the causal link between process and outcomes, inferences about maternal mortality are ungrounded (Graham 2002:3).

There are a number of well recognized difficulties with the use of indicators such as Maternal Mortality Ratios for the measurement of project and program impact. Maternal mortality is a relatively rare event in epidemiological terms. In areas or populations small enough to permit complete information to be gathered on maternal deaths, the numbers of deaths are often insufficient to measure statistically reliable change over a short period of time. The Sisterhood Method, used within many Demographic and Health Surveys for estimating national MMRs, resolves this by increasing the length of time period studied. Such retrospective data on deaths over a 5-10 year period is useful for international comparisons and in advocating for safe motherhood initiatives within national priorities, but it cannot be used for the measurement of pre- to post- intervention changes at the local or project level.

The USAID funded Healthy Mother/Healthy Child Project in Upper Egypt is one rare example of a large enough long-term program with sufficiently accurate baseline and follow-up data. Two community-level National Maternal Mortality Surveys indicate impressive reductions in the maternal mortality ratio over the lifetime of that project. Similar to AMDD, it has focused on providing access to 24/7 emergency obstetric care, but the Upper Egypt project has simultaneously combined this critical element with others, such as community involvement, improved surveillance systems, efficient management systems, and high-level political commitment (USAID Midterm Evaluation 2002). In the case of other Safe Motherhood projects (e.g. MotherCare and Options projects), where data was gathered prior to and upon completion of projects, results were limited by both the scale of the project and by the timeframe.

One useful alternative approach has been retrospective analyses that have examined programmatic approaches in developing countries that have successfully reduced maternal mortality (Liljestrand and Pathmanathan et al 2003 and Koblinsky 2003). The AMDD experience is compared against a framework derived from one of these analyses in the section *KEY FINDINGS AND OBSERVATIONS* of this report (pp.32-33).

IMPACT (the Initiative for Maternal Mortality Program Assessment) is a seven-year research program initiated in September 2002 and coordinated by the University of Aberdeen. This research program will focus upon the development of new and improved methods for collecting data on maternal and perinatal deaths and severe morbidity, and aims to provide baseline information that will allow the hitherto elusive health outcome evaluation of Safe Motherhood intervention strategies. First phase activities, supported financially by the Bill and Melinda Gates Foundation, DFID and USAID, have commenced in three focus countries: Burkina Faso, Ghana and Indonesia. Such measures might eventually be tested within AMDD projects and in the future be used to evaluate the EmOC approach in national level programs.

THE AMDD CONTRIBUTION

A Global Network with Global Reach

AMDD has helped to shift the focus of maternal health programs to include an emphasis on emergency obstetric services at national, district and sub district health services. Prior to the Nairobi Conference and the launch of the Safe Motherhood Initiative in 1987 there had been a comfortable but erroneous assumption that prenatal care could identify women at high risk of obstetric complications who would need to be referred for hospital care, and that the rest could be catered for by traditional birth attendants if these were trained in clean delivery techniques. Columbia University's early work challenged this assumption and made a significant contribution to the realization that risk screening did not work well in pregnancy, and that all women needed to have access to emergency obstetric care. Donors were often reluctant to confront this however, as it seemed to imply costly overhaul of the entire health care system.

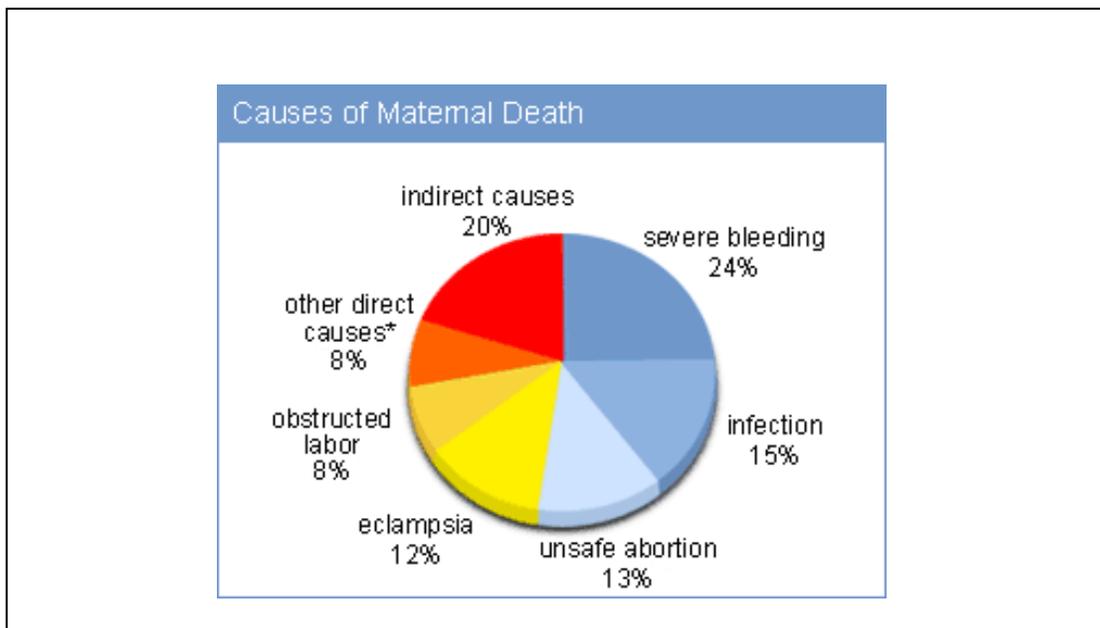
Comparison with Other Programs

At first glance, AMDD shares a number of common elements with other programs to reduce maternal mortality, in that they focus on obstacles to accessing care (3 delays model) or the means to overcome the obstacles (MotherCare's 'pathway to survival' model). They also include service delivery, behavior change and policy as programmatic elements, although the relative emphasis on these elements varies across programs. Recognition of the importance and effectiveness of 1) competency-based training and 2) clinical standards is part of the service delivery component of all the projects. Similarly, there is either an implicit (AMDD) or explicit set of activities that promote 'behavior change' among providers and clients, emphasizing, quality improvement, supportive supervision, teamwork and readiness, and health care personnel's understanding of their role in developing constructive accountability in the health system.

Policy change was a major focus in LAMM, for which PAHO was responsible, as it was for MotherCare and MNH (JHPIEGO), although few appear to have had the same transformative impact on policy that AMDD had in almost all of the countries where it had either national or regional field activities.

When compared with these programs, AMDD stands out as one of the few specifically focused on reducing maternal mortality and morbidity due to direct causes, rather than on a broader concept of maternal health. Therefore, unlike the other projects, it did not explicitly support antenatal care, nutritional interventions, community mobilization, and training of traditional birth attendants or healthcare personnel in community health posts. AMDD focused primarily on the third delay, conceptualized as the capacity of health facilities to respond to obstetric emergencies at either a basic or comprehensive level of care, although it also contributed to reducing the second delay in time it takes to get to the appropriate level of care by increasing the number and proximity of BEmOC and CEmOC facilities.⁷ AMDD's contribution to decreasing the first delay, the decision of a woman or her family to seek care, was more indirect. Increased quality of services and partners' continued involvement in complementary community outreach activities did address this delay to a lesser degree. This singular focus allowed AMDD to promote a much more streamlined set of interventions than previous safe motherhood programs, and, as a result, both healthcare administrators and policy makers perceived the approach to be more accessible and feasible with tangible results.

Up to 15 percent of all pregnant women experience potentially life-threatening complications. WHO attributes 72 percent of maternal deaths worldwide to five causes: hemorrhage, sepsis, unsafe abortion, eclampsia, and obstructed labor. More than 20 percent of maternal deaths are caused by diseases such as malaria, anemia, TB, and HIV/AIDS that are aggravated by pregnancy. Adolescents are at increased risk of dying during pregnancy and childbirth. They are twice as likely to die as women in their twenties, and teens younger than 15 are five times as likely to die of complications. The chances of survival are greatly increased by availability and access to emergency obstetrical care.



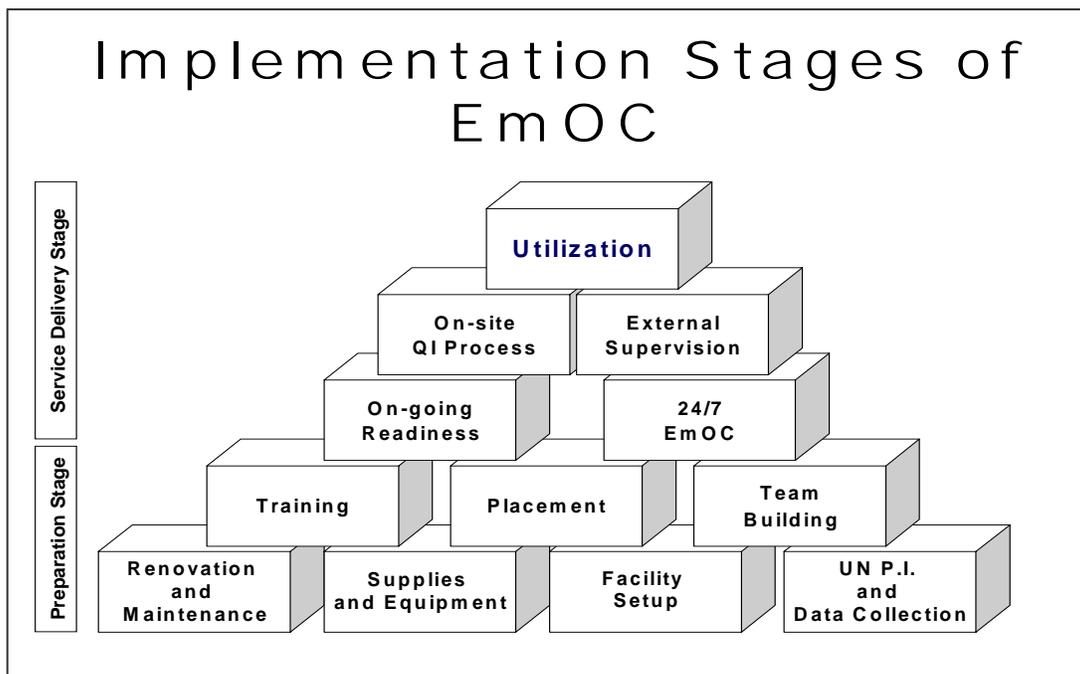
⁷ At a **Basic EmOC facility**, the six signal functions that need to be available are, the ability to administer parenteral antibiotics, oxytocics, and anticonvulsants, and the ability to remove placenta manually, to remove retained products, and to perform assisted vaginal delivery. A **Comprehensive EmOC facility** provides two additional signal functions – the ability to perform surgery (cesarean section) and to perform blood transfusion.

AMDD offered a clearly articulated set of interventions. The main implementation guidelines were the “building blocks” referred to by some partners as the “Bangkok framework” because they were the main focus of the 2002 AMDD Network Conference held in Bangkok. The activities undertaken by the project partners included baseline assessments, training, repair and renovation, equipment supply, management improvement, team building, establishment / improvement of healthcare management information systems, supervision, and clinical audits. It aimed to do this in a large number of countries through pilot projects implemented by partner organizations and with relatively small inputs into each country.

AMDD is a program that offers a fairly standardized set of actions (the “Bangkok framework”) for application in diverse developing country settings. Partners often innovated with varied approaches at local level that were not part of the standard AMDD package but usually very important for motivating healthcare providers, e.g., Appreciative Inquiry used in Rajasthan and Maharashtra (UNICEF), the Mobile Equipment Management Team, (UNFPA) Rajasthan; Hospital Action Planning, Bangladesh; shortened competency based EmOC training program used in Bangladesh, Nepal and Afghanistan (JHPIEGO); the inclusion of pharmacists and lab technicians in the EmOC training in Tanzania (CARE); and regional health networks linked to EmOC facilities in Peru (CARE). However, these were not set up for systematic evaluation within an operations research framework. It is important to emphasize that AMDD was not designed as a research project. It was not set up to test a set of hypotheses or assumptions, to estimate their cost effectiveness, or to compare and contrast alternative approaches.

Focus and Activities

Building Blocks: The Bangkok Framework



AMDD emphasized systems change as a goal of its program. Although only two programs, Bhutan and Bangladesh, actually dealt with the national health system, AMDD’s focus on the facility had a catalytic effect of provoking changes in human resource allocation, drug distribution, medical school training, and policies regulating blood safety, clinical procedures performed by providers of different skill levels. In many countries where changes were restricted to specific facilities, they had spillover effects for other

areas of healthcare, such as improved operating theaters, a more constant and safer blood supply, greater drug availability, and better quality of care.

AMDD was also responsible for framing access to emergency obstetric care as a human rights issue. Although the program struggled with articulating how to operationalize the perspective, it resonated with policy makers, donors, and civil society groups. In order to address the operational dimensions of the perspective, AMDD decided to support programs run by women’s organizations in Nigeria, the Philippines, Ecuador, Pakistan and the Dominican Republic to develop concrete interventions that articulated with EmOC activities in health facilities. This was the most experimental aspect of the program, but it has had a large impact on how the issue is framed in international and national discussions.

Use of the UN Process Indicators of Measurement of Outcomes

AMDD’s use of the UN Process indicators to monitor and evaluate all their country field projects distinguished it from other programs that developed their own set of indicators attuned to their specific activities. The UN indicators were used to examine the availability, use and quality of EmOC services in many developing countries where maternal mortality rates are high. Despite the difficulties of measuring project impact on reducing maternal mortality, AMDD did take on the challenge by using the UN Process Indicators to measure progress towards reducing the leading causes of maternal deaths and increasing the availability of life-saving services. The UN Process Indicators, however, are not population-based impact measures.

Table: UN Process Indicators (Source AMDD Workbook 2003)

UN Process Indicator	Definition	Recommended level
1. Amount of EmOC services available	Number of facilities that provide EmOC	-Minimum: 1 Comprehensive EmOC facility for every 500,000 people -Minimum: 4 Basic EmOC facilities per 500,000 people
2. Geographical distribution of EmOC facilities	Facilities providing EmOC well-distributed at sub-national level	-Minimum: 100% of sub-national areas have the minimum acceptable numbers of basic and comprehensive EmOC facilities
3. Proportion of all births in EmOC facilities	Proportion of all births in the population that take place in EmOC facilities	-Minimum: 15%
4. Met need for EmOC services	Proportion of women with obstetric complications treated in EmOC facilities	At least 100% [Estimated as 15% of expected births]
5. Cesarean sections as a percentage of all births	Cesarean deliveries as a proportion of all births in the population	Minimum 5% Maximum 15%
6. Case fatality rate	Proportion of women with obstetric complications admitted to a facility who die	Maximum 1%

In theory, the UN Process Indicators offered a common set of measures to use and aggregate across countries. Multiple partners working in 52 countries offered a unique opportunity to test the validity of

the indicators on a broad scale. AMDD viewed the indicators in the aggregate as plausible proxies for maternal mortality ratios based on the association of very high maternal mortality ratios with low coverage of EmOC services, low utilization of EmOC services and poorer quality of care.

Plausible Association between Maternal Mortality Ratios and the UN Process Indicators

In Countries with National Level EmOC Services Data	Maternal mortality ratio*	Deliveries in EmOC facilities	Met need	Cesarean delivery	Case fatality rate
United States	17	92%	99%	21.1%	0.1%
Sri Lanka (16 districts)	92	77%	75%	13.7%	0.3%
Morocco	220	41%	33%	2.8%	0.8%
Nicaragua (9 regions)	230	29%	31%	6.3%	0.4%
Bangladesh	380	8%	27%	2.2%	2.16%
Bhutan	420	11%	19%	1.3%	1.5%
Senegal	690	10%	12%	1.1%	4.0%
Benin	850	13%	23%	2.7%	3.5%
Chad	1100	9%	12%	0.5%	3.9%

In practice, it proved far more difficult to use the indicators consistently and accurately. Difficulties in data collection, calculation, and interpretation limited their utility for both national and international comparisons. As the AMDD Program was not designed or intended as a research program, they did not design the appropriate research and evaluation protocols for testing the sensitivity and validity of the UN Process Indicators under different conditions. Their great value proved to be that they focused healthcare staff on how their actions affected utilization and outcomes within the facility. The indicators notably increased accountability of service providers and administrators for improving EmOC care. In several countries, such as Afghanistan, Bangladesh, Mozambique, Nicaragua and Morocco, the indicators have been incorporated into national M&E and HMIS systems.

Organization and Management

AMDD's approach to management and implementation also sets it apart from the other projects; it has been extremely flexible while maintaining the sharp focus on EmOC. Organizationally the AMDD structure had many merits. The Gates Foundation (2002) commissioned report by McKinsey on global health alliances characterized AMDD as a "General contractor" model, but this typology belies the flexibility of the working relationships reported and valued by project partners. Columbia University

maintained a key coordinating, advisory, selecting, disbursing and monitoring role without a top-heavy central staff, or a large overhead. Otherwise, Columbia left the implementing partners of CARE, Save the Children, UNICEF, and UNFPA, as well as smaller partners such as RPMM, and RHRC, to design and run their own programs. They were strategic in picking partners with a wide reach across the world and significant experience in implementing projects.

Partners repeatedly highlighted that their association with an internationally renowned university gave them enormous technical credibility with professional associations, medical faculties, and policy makers. We heard instances of project partners requesting (and receiving) visits from specific central resource persons to assist in lobbying reluctant zonal leaders. The annual AMDD conferences provided opportunities not only to receive orientation and guidance from the Columbia team (the “Bangkok framework” etc), but also to share experiences across the network, and the enthusiasm and sense of joint purpose was highly evident at the 2003 Malaysia conference. Most partners also built in internal cross-learning meetings or visits for their own projects. It was evident that such activity contributed to maintaining morale and allowed for the borrowing and adaptation of ideas across the networks.

The loose organizational structure was also a weakness in the sense that it prevented aggregation across implementing organizations and across countries, and weaker partners would have benefited from additional technical guidance. However, the flexibility of the partner/Columbia University relationships was highly valued by the partners and was held in contrast to experiences with other donor funded projects which tended to have specific deliverables, strong influence from the donor and little room for individual negotiation and innovation.

KEY FINDINGS AND OBSERVATIONS

Overall Assessment of AMDD

Field visits and feedback from partners demonstrated that AMDD is a program that has high impact, high visibility, and is highly regarded by governments, international development agencies, and civil societies. The partnership forged by Columbia University focused the international community on a critical part of the health system that was absolutely essential to reducing maternal mortality. With the resources provided by the Foundation, AMDD has been able to convince many key multilateral and NGO partners that it was possible to design and implement maternity care programs that focused on healthcare facilities. AMDD broke through the conceptual barrier against dealing with the healthcare system by saying that you could catalyze systemic change by improving one critical part of the system –i.e. the capacity of a threshold number of health facilities to deliver comprehensive and basic emergency obstetric care (EmOC) services. AMDD redirected the maternal health paradigm of maternal health to focus on reducing maternal deaths, and presented implementers with a focused and manageable set of interventions.

High Impact

“A remarkable story of transformation has unfolded in the health facilities of Bangladesh that has touched the facilities, the medical force, the community and the decision makers of the country in such a way that at long last a woman’s right to survival has found a place of priority in the national agenda.” (Dr. Mizanur Rahman, Director General of Health Services, Ministry of Health, Bangladesh)

The AMDD project worked at scale involving district, regional and national ministries of health to advocate for EmOC to be part of the national safe motherhood agenda in a large number of countries

through demonstration projects implemented by partner organizations and with relatively small inputs into each country (see Table on p. 11). Through this process, AMDD has made a significant contribution to reorienting the focus of maternal health programs. In the past, donors had been reluctant to provide resources to EmOC because they believed it was too expensive to do it correctly and that it was not possible without reforming the whole health system and they saw that as potentially frustrating, too monumental, and expensive. UNICEF implemented AMDD programs on a national scale in two countries, Bangladesh and Bhutan. These programs resulted in major transformations of the healthcare system. In addition, AMDD partners conducted national-level needs assessments in 23 countries and influenced policy change in 13.

One of the AMDD Program's goals was to increase women's access to good quality EmOC services worldwide. Covering more than 179 million people, the 18 major AMDD-supported projects upgraded a total of 159 facilities to provide EmOC services in their project areas over three years (making a total of 387 EmOC facilities in project areas). All project facilities worked to improve the quality of care offered to women with obstetric complications.

In four years, more than 270,000 women with obstetric complications received treatment at EmOC facilities in project areas. Individual projects saw average increases of 144 percent in the number of women with obstetric complications treated from baseline⁸ to 2003. Not only were the project facilities treating more women, but fewer of them were dying due to improvements in the quality of care. From baseline to 2003, the case fatality rate² decreased, on average, by 50 percent. In 2003, the average case fatality rate for all EmOC facilities in project areas was 1.4 percent, down from an average of 3.2 percent at baseline. Reductions in case fatality rates are directly attributable to improvements in the availability and quality of services.

High Visibility

AMDD partners worked extensively with policy and decision makers in such countries as Bhutan, India and Vietnam (which is an example of a highly centralized country in the initial stages of the decentralization process) to sensitize them to the problem of maternal mortality and morbidity and the potential solutions. In Bhutan and Bangladesh for example, the result of the Gates AMDD grant was to establish high profile national programs to reduce maternal deaths and improve maternal/neonatal outcomes. In both countries, AMDD policy and technical inputs, accompanied by sufficient funds to begin to address the problem for the first time at the national and local levels, led to national written policies deeming the reduction of maternal deaths as high priority, along with the necessary political support down to the local levels to improve the availability and quality of life-saving services for mothers.

Highly Regarded

The evaluators heard nothing but praise for the project activities and accomplishments in the field visits, focus groups, and through written and oral interviews. Stakeholders of all types expressed their satisfaction with the results of the program and for the vision and approach that AMDD has brought to the task of responding to complication during pregnancy and childbirth. All project partners reported improvements in the extent and quality of the obstetric care in the project facilities and the evaluation field visits corroborated this.

AMDD Succeeded Where Others Have Failed: The Evidence

⁸ Baseline was either, the year 1999, the year 2000 or a period of 12 months falling in the years 1999 and 2000.

² Case Fatality Rate = Proportion of women treated for obstetric complications in EmOC facilities who died

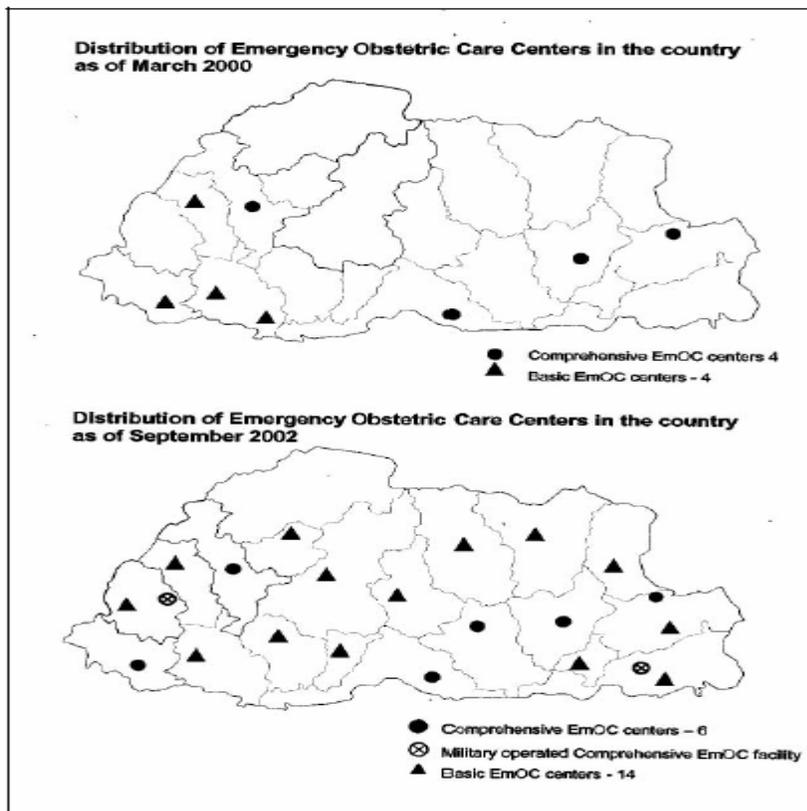
Raised Visibility of the Problem and Motivated High-level Policy Makers to Address Maternal Mortality

Causal factors that together influence the magnitude of maternal deaths cannot be remedied by making small changes “at the margin” of the health system. Instead, they require major changes in the way health services are financed and delivered, often in creative new ways (Krasovec and Shaw 2000).

AMDD achieved impressive results in shifting the policies of governments, international agencies and donors, primarily by focusing on the message “emergency obstetric services are a basic requirement for reducing maternal mortality.” The funds provided by the Gates foundation enabled AMDD to capture and maintain the attention of opinion leaders and stakeholders in a position to take action to address the problem. In several countries, AMDD achieved significant shifts in the policy environment by delivering a focused message to key stakeholders through an informed policy/advocacy process in conjunction with effective technologies/procedures/interventions. For instance, in Vietnam and Peru, the governments revised their standards and protocols based on AMDD tools; and in India, AMDD contributed to the revision of maternal health policies in the state of Rajasthan, and in national policies guiding the allocation of human resources, standards for blood banks, and regulations of what kind of providers can administer different types of clinical procedures.

In Bhutan (see figure below), AMDD transformed the governments approach to maternal health. *The Ninth National Plan* states:

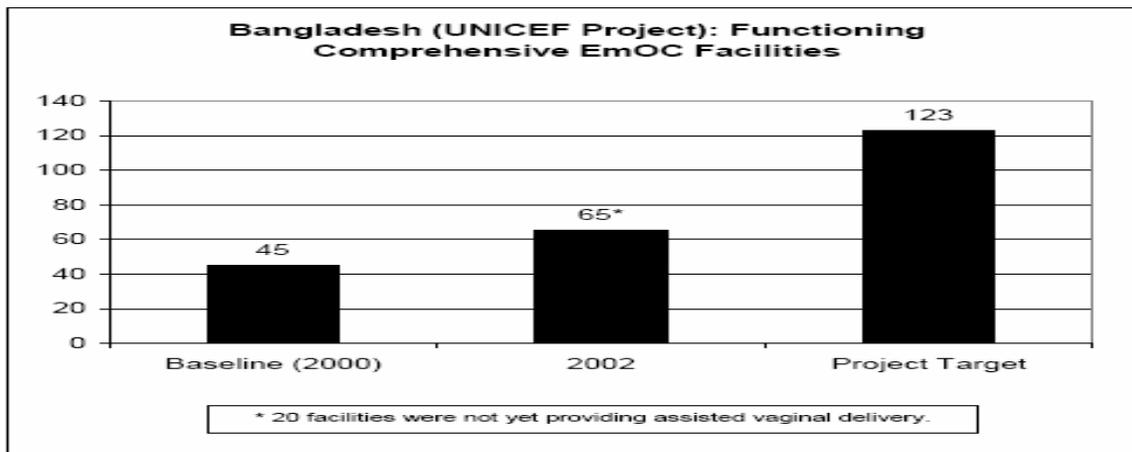
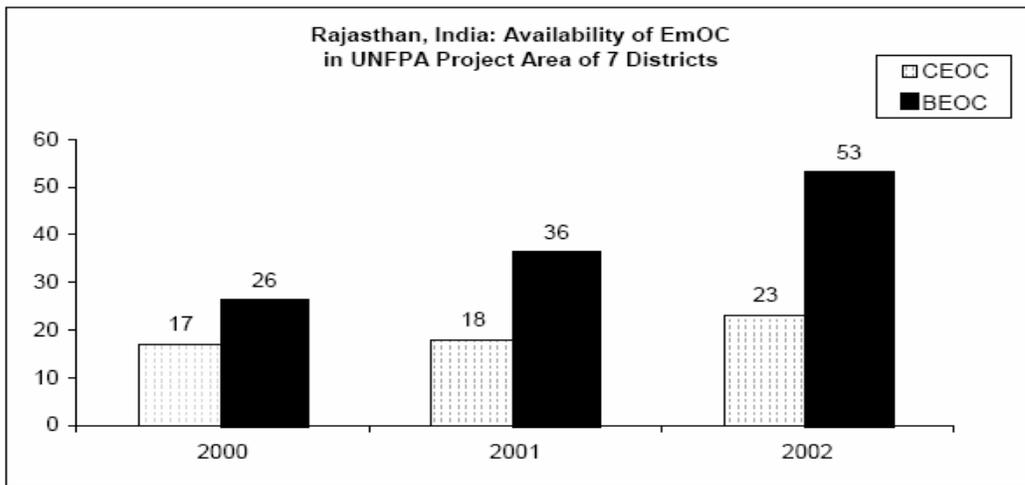
“During the transition of the modernization of the economy and society women and children are particularly vulnerable. The Royal Government acknowledges the emerging economic and social trends and has committed resources and redirected its plans and programs to improve Mother and Child Health and mainstream gender needs and interests.”



The Evidence Base

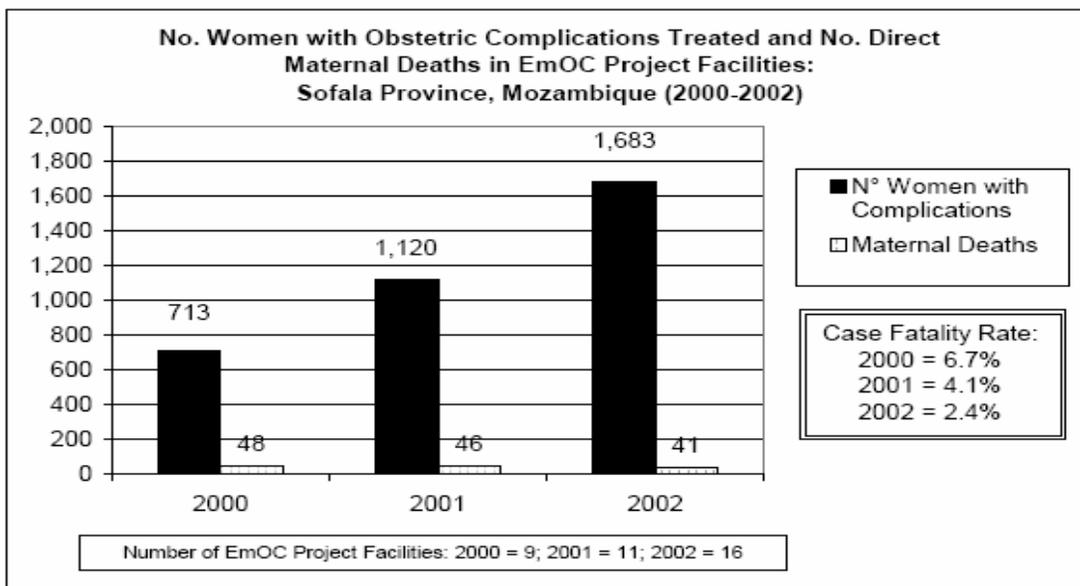
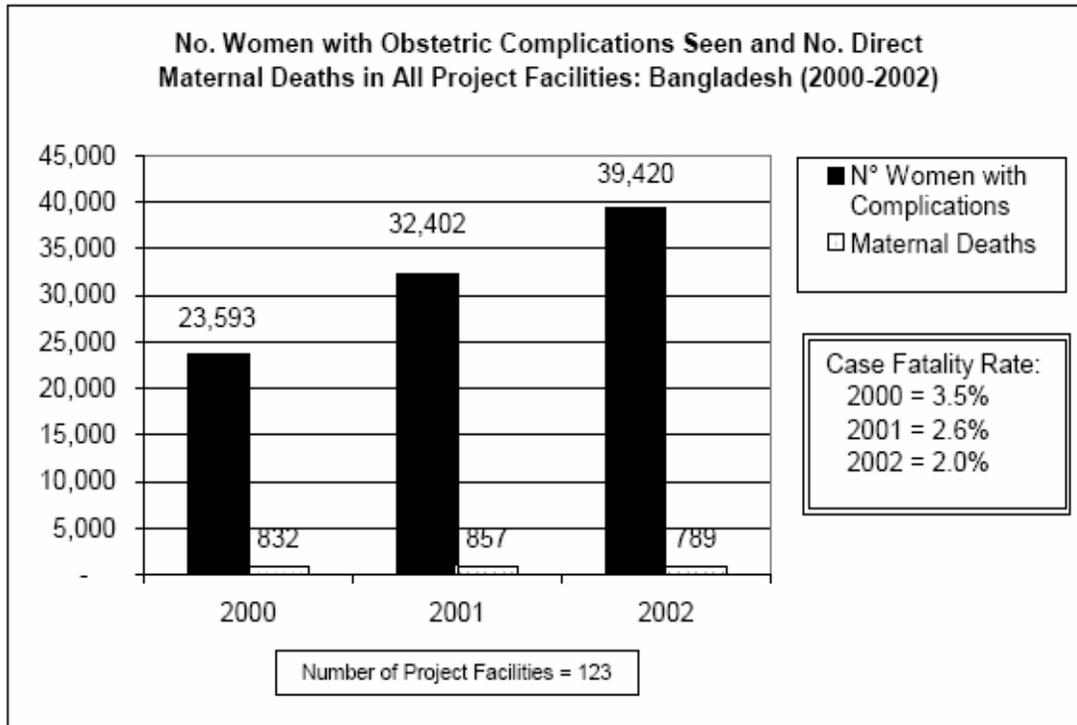
The evidence base for AMDD’s success rests largely on the use of the UN Process Indicators. The program used the indicators for 2 main purposes: 1) to ascertain the baseline status in targeted districts or on a national scale, depending on the country and 2) to monitor progress as the facility level. As stated earlier, it is difficult to aggregate information up from the facility level because the denominators for the indicators were not always calculated consistently, even in a single district. It is also difficult to use them to measure impact because, in most countries, needs assessments used to establish baselines were not re-applied towards the end of projects. Nevertheless, facility-based data do illustrate some of the gains achieved by the project in increasing utilization of services and decreasing case fatality rates.

Increased Availability of EmOC Services Program in Rajasthan, India and Bangladesh⁹



⁹ Figures from the AMDD Fourth Annual Report p. 21-23

Reductions in Case Fatality Rates in Bangladesh and Mozambique¹⁰



¹⁰ Figures from the fourth AMDD Annual Report, p. 25

Achievements of the Averting Maternal Death and Disability Program in Selected Countries¹¹

Country	Implementing Partner	MMR per 100,000	Total Population	AMDD Investment	# of Expected Births per Year (target pop.)	Increase in Utilization of EmOC Services	Decrease in Case Fatality at Facilities
Bangladesh	UNICEF	est. 320-400	128 million	\$4,762,000	39,350,232	-123 functioning facilities - 54% increase in births at targeted facilities -127% in # of women admitted with obstetrical emergencies -56% increase in c-sections (to 2.3%)	2.16% in 2002 in facilities (comparison not available for whole country)
Bhutan	UNICEF	420	657,548	\$ 616,000	23,672	-19 facilities upgraded -% of births in facilities doubled from 11% to 20.5% -% of c-sections increased from 1.28% to 2.6% (5% is target)	Around 1.5% in 2003 (held steady despite doubling of births attended)
India	UNICEF/ UNFPA FOGSI	540	31.5 million in the 13 districts in Rajasthan and Maharashtra	\$1,500,000 \$1,400,000 \$25,000	761,000	-Increased functioning CEmOC facilities from 17 to 24 -Increased functioning BEmOC facilities from 26-55 -25% increase in deliveries at facilities -30,000 women with complications received care -11,000 women had c-sections -62% increase in met need (to 14.3%)	- Decreased by 50% from 1.8% to .9%
Mali	SAVE/ UNICEF	1200	434,976 in the 2 districts of Bougouni and Yanfolila	\$670,0682 \$50,000	21,314	-42% increase in # of women treated in 2 facilities (396 in 2003) -11% increase in c-sections (2003)	40% decrease to 5% at Bougouni Hospital/ -92% decrease to 1% at Yanfolila Hospital

¹¹ These are the countries that the evaluation team visited (Bhutan, Bangladesh, India, Nepal, Vietnam, Peru, and Tanzania) or were notable because of the size of the program (Morocco) or unique challenges (e.g. Mali). Data for the rest of the AMDD countries can be compiled by the grantee and should be requested directly from them. It was not possible to get totally comparable information for all countries given differences in data collection and scale of projects.

Country	Implementing Partner	MMR per 100,000	Total Population	AMDD Investment	# of Expected Births per Year (target pop.)	Increase in Utilization of EmOC Services	Decrease in Case Fatality at Facilities
Morocco	UNFPA	220	5.4 million in the 13 provinces in the Marrakech Region	\$1,800,000	141,000 in districts served and 656,904 nationally	-28% increase in complications treated in project facilities (25,000 women in 4 years) -42% increase in c-sections (over 10,000 from 2000-2003)	Decrease from 1% to .79 % during project period in facilities in 13 provinces
Nepal	UNICEF	740	National Pop. Est. 23.6 million	\$1,100,000		-3 of 4 planned CEmOC facilities are functional -100% increase in births in all facilities (4388 in 2003) -35% increase in c-sections (still well below target of 5%)	-Decrease from 1.5% to .3% in 3 facilities
Peru	CARE/ IPAS	276	414,000 in Ayacucho	\$629,096 \$47,061	9924	-Four BEmOC and one CEmOC facilities now functional (none prior to project) -64% increase in complications treated in Northern Ayacucho -Met need increased from 21% to 41% in project area	39% decrease from .79% to .48% in facilities
Tanzania	CARE	530	588,000 in two districts, Kwimba and Missungwi	\$616,000	24,122	-3 BEmOC and 1 CEmOC facilities functional -100% increase in # of women treated with obstetrical emergencies at facilities -# of c-sections tripled in 2 years	Decrease from 10% to 2.4% in 2 years
Vietnam	SAVE	130	4,237,331 in two provinces, Hue and Quang Tri	\$719,566	67,252	-CemOC at all 5 project facilities -89% increase in deliveries -75% increase in # of women treated with complications -65% increase in c-section deliveries	-100% decrease to zero fatalities in 2003

Enabling Factors

There were three key enabling factors integral to the AMDD strategy that contributed to the program's success. They are strategic alliances among different partners, a focused technical approach, and capitalizing on prior relationships and the reputation of Columbia University as a premier research and teaching institution.

Strategic Alliances

Project implementing partners were chosen because they were already established in a number of countries and were actively engaged on initiatives around maternal health and healthcare. Some of these had already been working with the Columbia University led group on safe motherhood prior to AMDD (e.g. UNICEF with RPMM) or had significant field presence (e.g. SAVE, CARE, and UNICEF), and were therefore able to get projects “up and running” quickly. Others took somewhat longer to become involved and to carry out their initial needs assessments in the proposed areas.

The extent to which they each partner already possessed experience and working knowledge of how to advocate for, establish and sustain EmOC services varied. For Save the Children and CARE, involvement in AMDD represented a new area of work that they integrated into existing project districts which typically were working on issues such as family planning, sexually transmitted infections, community awareness of obstetric danger signs and community transport, as well as child health and non health issues. For UNICEF, AMDD was their first effort to focus on women's health and rights. Although they had previously been involved in community level activities, such as TBA training, community mobilization, antenatal care, and nutrition, AMDD was the first time that they focused on clinical services. For UNFPA, AMDD represented both a new focus and a first experience in direct project implementation. The Regional Prevention of Maternal Mortality Network on the other hand, built upon existing experience of working around EmOC in its original member countries, having been working on initiatives to address all “three delays”. It used AMDD funds as seed money to expand that approach and their network in a larger number of African countries.

Focused Technical Approach

As stated in the previous section, AMDD offered a clearly articulated set of sequenced interventions leading toward increased utilization of EmOC services, known as the “building blocks.” Not all implementers stuck strictly to the sequencing of the “blocks”—and some project participants seemed more familiar with these than others. But those for whom this type of initiative was new did report that this structured stepwise approach was very helpful to them for managing a complex intervention. It also permitted a strong sense of understanding and ownership of the process among local project workers and facility managers.

The conceptual framework was supported by technical assistance from different sources. Technical expertise was in-put into the country/local level EmOC activities in three main ways:

1. Internal to the implementing organization: Some implementing partners (SAVE, CARE) recruited a clinical expert (typically with midwifery or public health background) on staff to guide the projects through implementation. RPMM used clinical specialists from its own existing network membership to act as consultants to new and ongoing projects. UNICEF received support from its regional and headquarters staff.
2. AMDD's technical partner organizations: Columbia University developed a system of “technical partner” organizations with field experience in key areas (JHPIEGO – competency based training;

EngenderHealth -quality of care and facility management; FHI – clinical supervision and data collection and monitoring; ACNM with CARE– life saving skills training). Implementing agencies could call on this outside technical assistance to supplement local expertise. The technical partners also developed tools in their areas of expertise, such as the IMPAC manual for managing complications in pregnancy and childbirth (JHPIEGO/WHO), *Quality Improvement for Emergency Obstetric Care Tool book* (EngenderHealth), *Improving Emergency Obstetric Care Through Criterion-Based Audit* (FHI and Columbia University).¹²

3. At the request of the implementing partners, Columbia University developed a “technical monitor” system in which they used identified specialists (fulltime staff or consultants) with a corresponding skill area in management, project monitoring, clinical aspects, or knowledge of the country, who visited implementing projects on a regular basis to assist at key stages and to monitor progress.

Partners viewed these inputs as highly valuable and appropriate. Our visits to the field confirmed the value and utility of the tools. In addition to seeing them in use, we observed local translations of the content in the form of posters displaying protocols and standards, and changes in management information systems, patient flows, and preparedness.

Capitalized on Prior Relationships and Reputation

By picking these partners and building their capacity in EmOC it was easier for AMDD to leverage other resources through them. The partners in turn were able to influence AMDD’s thinking and to implement the programs that they felt were the most appropriate to address the local needs.

The flexibility of the partner/ Columbia University relationships was highly valued by the partners and was held in contrast to experiences with USAID funded projects which tended to have specific deliverables, strong influence from the donor and little room for individual negotiation.

AMDD Catalyzed Significant Changes in Approach

Simplified Message and Approach to a Problem Perceived as Overly Complex and Difficult

Throughout the five years, AMDD maintained a focus on EmOC services as the only effective way to reduce maternal mortality from direct causes. The clear focus facilitated explaining to policy makers what needed to be done. It also spoke to the interests of healthcare providers at secondary and tertiary level facilities who had often felt neglected in public health programs that focused on community-level strategies. The project’s promotion of a limited set of concrete actions galvanized healthcare providers to action, as they felt empowered to deal with the aspects of the healthcare system within their control and manageable interest. The construction of access to EmOC as a human right also resonated with stakeholders concerned about equity issues. The combination of the two foci brought together stakeholders that previously had perceived themselves to have divergent interests (e.g. healthcare providers and women’s advocacy groups).

Convinced global agencies, to include maternal mortality as a focus in their programs

AMDD leveraged significant resources for expanding EmOC services to other parts of the countries where they had demonstration projects. In other instances AMDD convinced donors and governments to invest in needs assessments to ascertain the EmOC coverage according to UN Process Indicator benchmarks. Often, needs assessments were instrumental in convincing the same governments and donors

¹² A complete list of the tools is provided at the end of the *References* section

to incorporate EmOC into national health programs. The list below illustrates some of the most notable accomplishments.

INFLUENCE OF AMDD ON HEALTH PROGRAMMING

ORIGINAL AMDD FUNDING		ADDITIONAL RESOURCES LEVERAGED			
Country	Amount/ Partners	Additional resources for AMDD activities	Expansion of EmOC activities	Incorporation of EmOC into national programs	Donors
Afghanistan	\$50,000 and T.A. to UNICEF	Support for upgrade of the first Center of Excellence at Malalai Hospital (CBT), MIS development	National Strategy workshop, EmOC in 32 districts, 5 Centers of Excellence		UNICEF, World Bank, USAID
Bangladesh	\$4,762,000 to UNICEF	Equipment for 47 additional facilities			JICA
Bhutan	\$616,000 to UNICEF	Equipment donation		\$5 million to National Health Fund Trust as a result of AMDD's facility improvement	JICA, Asian Development Bank
Dominican Republic	No funds/ T.A. only			EmOC model for MM reduction in \$35 million RH and HIV/AIDS program	USAID
India	\$1.5 million to UNICEF; \$1.4 million to UNFPA, \$25,000 to FOGSI		\$500, 000+ for expansion of CBT training centers by FOGSI and JHPIEGO	EmOC in \$2 billion RCH II program, EmOC in \$75 million Rajasthan State Health Systems Program	MacArthur Foundation World Bank, EU, DFID
Mali	\$670,682 to Save the Children, \$50,000 to UNICEF for Needs Assessment		\$14,382 contributed to expand to national needs assessment		UNFPA
Mozambique	\$1,000,000 for Sofala Province	Equipment donation	Funding to improve EmOC facilities in the other 9 provinces		Italian Cooperation, UNFPA, UNFPA, NORAD, DFID, WHO USAID
Nepal	\$1,102,000 to UNICEF for 4 districts		\$30 million for upgrading EmOC facilities in 10 districts		DFID
Nicaragua	\$700,000 to UNFPA	Equipment and supplies	EmOC in 3 additional regions		UNFPA, Luxembourg PAHO, USAID
Niger	\$50,000 for needs assessment	\$1,000,000 for Agadez Region			UNFPA, Luxembourg

ORIGINAL AMDD FUNDING		ADDITIONAL RESOURCES LEVERAGED			
Country	Amount/ Partners	Additional resources for AMDD activities	Expansion of EmOC activities	Incorporation of EmOC into national programs	Donors
Pakistan	\$952,000 to UNICEF			EmOC in \$70 million Women’s Health Program	Asian Development Bank, OPEC
Peru (FEMME Project)	\$629,096 to CARE	\$30,000 in local funds for renovations and \$35,000 for blood bank equipment	EsSALUD (Employer Health Services, a contributory health system of 7 million beneficiaries with nearly 400 health facilities) has adopted FEMME’s EmOC guidelines/ protocols and wall charts for use in their urban hospitals nationwide	\$25,000 of Health Reform funds for training of providers in EmOC \$3.3 million for displaced populations in Ayacucho includes EmOC facility improvements; funds for establishing training centers in 7 Departments (states)	World Bank IDB PARSALUD Dutch Aid JICA
Rwanda	\$519,220 to CARE	Equipment donation for 3 facilities			JICA
Senegal	\$50,000 for needs assessment		\$1.27 million for 2 regions		UNFPA
Sri Lanka	\$345,000 to UNICEF		\$20,000 to complete needs assessment in conflicted areas		MOH, Asian Development Bank
Uganda	\$50,000 to UNICEF/ needs assessment in 19 districts	Completion of needs assessment in remaining districts		EmOC prioritized in Sector Wide Approach (SWAp) for Health	World Bank, EU, GOU, other donors, USAID

Written responses to an interview questionnaire from the AMDD implementing partners also illustrate the transformative influence AMDD had on maternal health programming within their organizations:

- “CARE had decided to work in EmOC in 1999, however we did not have experience doing this. Thus, AMDD influenced how we did these programs, both in the AMDD countries as well as in non-AMDD countries that received other funding (e.g. Guatemala with EU funding). Through AMDD, we were also able to influence many MOH officials (CARE).”
- “The Humanitarian community at large have benefited from lessons learned and tools and resources developed. There is potential to strengthen this linkage in the future. Finally, refugees have greatly benefited from the work of the AMDD Project (RHRC).”
- “For UNFPA, the AMDD program has been determinant in re-formulating MMR strategy, advocating policy change, fostering internal consensus about the Fund’s contribution to MMR, attracting further resources, strengthening partnership, and increasing national and international visibility (UNFPA).”

- “The partnership with the AMDD Program has helped to establish safe motherhood, and especially improving EmOC, as key components of our reproductive health programming beyond the countries for which we received grants (Save the Children).”
- “AMDD was an important outside influence on and support for people within UNICEF who believed in EmOC, and enabled them to effect policy change within the organization (UNICEF).”

Demonstrated Feasibility of Improving Maternal Mortality and Morbidity Outcomes at All Levels

In her review of lessons learned from seven countries, Marge Koblinsky (2003) identifies six factors for success in reducing maternal mortality ratios. Her conclusions corroborate findings of other recent retrospective analyzes of successful strategies (Pathmanathan and Liljestrand 2003, Gay 2003). AMDD compares favorably when measured against lessons learned from retrospective case studies in other countries.

1) Increased availability of a skilled birth attendant.

Training of providers at basic EmOC (BEmOC) and Comprehensive EmOC (CEmOC) facilities in “evidence-based medicine” was a principal focus of AMDD. In a few cases the program also supported training in life-saving skills for healthcare providers at primary level healthcare facilities, but this was not a widespread practice. Although the project did not contribute significantly to increasing the availability of skilled birth attendants who work outside of the BEmOC and CEmOC facilities supported by the implementing partners, some of the more mature programs (e.g. Vietnam and Peru) are beginning to train at the community-level skilled healthcare providers in life-saving skills and integrating them into the network of EmOC facilities.

2) Increased availability of health facilities to provide skilled birthing care.

The primary focus of AMDD was to increase the availability of skilled emergency care in health facilities to treat complications in pregnancy and childbirth. The capacity of participating health facilities to opportunely respond to and resolve obstetrical complications has increased appreciably as a result of the AMDD program. AMDD significantly improved the skills of different types of healthcare providers in facilities, including auxiliary and registered nurses, midwives, obstetricians, and anesthesiologists. In addition, the project strengthened blood banks and drug supply systems. In India, the program supported a public-private partnership between public hospitals and local business organizations that raised money for rotating funds to purchase and distributed essential drugs at the hospital door.¹³

3) Service costs appropriate for the setting.

There were active efforts in all AMDD projects visited by the evaluation team to address financial barriers to accessing care. In India and Nepal, health center policies were changed so as to immediately treat any women with an emergency regardless of her capacity to pay. In Peru and Ecuador, national laws promise free care for all women from pregnancy through six months post-partum, but the laws are not enforced rigorously. In Ecuador, the advocacy and coalition-building activities emphasized women’s right to free care by pressuring local hospitals to follow the law. They created oversight committees for health facilities at all levels to ensure that women’s rights to free care during delivery were respected.

Koblinsky notes that addressing cost barriers alone is rarely sufficient to increase demand. She argues that it is necessary to address cultural preferences for home-based births in some countries, as well as other barriers, such as geography, transport infrastructure, etc. Although this was not an explicit emphasis of

¹³ AMDD trained professional midwives that had training in medical institutions. It did not train Traditional Birth Attendants (TBAs) based on overwhelming evidence that TBA training does not contribute directly to reducing maternal mortality. TBAs have the potential to be an important nexus between women and health services and therefore merit training in conjunction with other community-based interventions as a complement to EmOC.

the project, many AMDD partners did address these ‘second delay’ constraints by including ambulance drivers in processes to improve quality of care, by building support from municipal authorities, the transportation sector, and communities. In Peru, a basic EmOC facility raised money from local businesses to build a waiting home for women from distant communities. As in Bhutan, a mountainous topography makes it virtually impossible to reach a facility in an emergency in time to save a woman’s life.

4) *Strong policy guidance for delivery care.*

AMDD stimulated changes in policy formulation at the national level and implantation at the regional and local levels. In several instances (e.g., Vietnam, Peru, Bangladesh, and Bhutan), AMDD influenced changes in policies regulating what procedures could be performed by providers of different skill levels; standardization of protocols; availability and distribution of essential drugs; regulation and availability of blood; and introduction of standard procedures, such as MVA. AMDD also had a significant impact on reforming and standardizing in-service and some pre-service training curriculum and pedagogy, allowing doctors, nurses, and midwives to be trained together as a team.

5) *A functioning referral system, beginning with providers at the community level.*

In the best of cases, Vietnam and Peru for example, a functioning referral and counter-referral system provided the glue for integrating the different levels of response to obstetrical emergencies. In both countries, the system seemed to work not only because they had the necessary infrastructure (transport and communication), but also because providers throughout the system knew and trusted each other. The trust was a product of a supportive process of supervision whereby trained medical personnel received ongoing supervisory support from their trainers in their own facilities, as well as periodic opportunities to refresh their skills at higher level facilities. In both countries the staff of BEmOC and CEmOC facilities described the supervision as collaborative partnerships.

6) *Accountability for-providers' performance.*

The program supported the development and application of a number of tools to improve accountability of provider performance. The use of the UN Process Indicators has increased the facilities’ capacity to monitor outcomes. In the best of circumstances, providers have used the information as a management tool, along with more qualitative methods such as near miss case study reviews, death audits, and feedback from clients. Other methodologies, such as COPE and Appreciative Inquiry, were used to stimulate a sense of shared responsibility for outcomes and reorient providers to focus on quality of care from both technical and client-centered perspectives.

As indicated by the discussion earlier in the evaluation report, maternal mortality is costly to measure and does not yield the information needed to plan and monitor safe motherhood activities. This has led to a search for appropriate process indicators able to measure access to and use of those services most likely to reduce maternal mortality. AMDD-funded projects have been strongly encouraged to use the “UN Process Indicators” to measure progress towards implementation of EmOC at the facility level. These indicators are based on the ability of a facility to perform certain critical clinical functions, known as “Signal Functions”, to address life-threatening complications due to direct obstetric causes.

The data collection elements—principally promotion of local application of the “UN indicators” set—were aimed more at local tracking of improvements in EmOC provision than at measurement of how the AMDD Program affected health outcomes. At a Basic EmOC facility, the six signal functions that need to be available are the ability to administer parenteral antibiotics, oxytocics and anticonvulsants, to remove placenta manually, to remove retained products, and to perform assisted vaginal delivery. Two additional signal functions—the ability to perform surgery (cesarean section) and to perform blood transfusion—are required for a facility to qualify as a Comprehensive EmOC facility.

AMDD's use of the UN Process indicators was instrumental in providing healthcare providers, administrators and policy makers with immediate tangible measures of results. The indicators were more useful for building accountability for health outcomes than as accurate impact measures. Nevertheless, they did focus providers on health outcomes and the processes that lead to lower incidences of maternal deaths and disabilities.

Filled Leadership Gap in Championing Maternal Mortality as a Priority Global Health Issue

Despite the status as one of two millennium development goals (MDG) focused on women, the goal to "improve maternal health" has no single influential advocacy group to promote commitment of resources and raise international awareness and interest. One of the principal limitations to maternal health advocacy is the lack of investment in programs to address maternal mortality and morbidity. AMDD, with resources from the Foundation, was able to increase commitment on the part of other donors and governments in a way that previous advocacy efforts have not.

By funding Columbia, a renowned institution with a worldwide reputation for maternal health advocacy, the Gates Foundation championed the issue on an unprecedented scale. The combination of resources with the reputation of Columbia University for excellence in research and teaching, as well as Columbia's participation in the MDG review process has been effective raising the issue to global attention.

Summary of Conclusions about AMDD

"Health system performance has always been determined by how things are financed, how providers are motivated, how services are organized, how health care is regulated, and how clients or potential clients behave" (Krasovec and Shaw 2000).

- AMDD demonstrated to key stakeholders, both within and outside of international agencies, that it was possible to undertake a set of activities that address principal causes of maternal mortality and morbidity.
- AMDD has influenced the thinking and priorities of donor agencies such as UNICEF, who previously had ignored the issue, to identify the reduction of maternal mortality as a priority.
- AMDD demonstrated a small investment can make a difference in reducing maternal mortality in the right setting and under certain conditions, but it is necessary to recognize that the hospital-based services so critical to saving women's lives imply higher costs than many other types of interventions, although they may not be higher in the aggregate when time and efficacy are considered.

AREAS FOR IMPROVEMENT AND FUTURE EMPHASIS

"Emergency obstetric care is about something more than providing services-it is also about delivering hope, about saving lives and building the future of the community. It is about a women's right to life and health" (Dr. Mizanur Rahman, Director General of Health Services, Ministry of Health, Bangladesh).

Measurement and Indicators

It was clear to the evaluation team that, as a result of the AMDD projects, many facilities were collating and reviewing data on obstetric complications for the first time, a highly positive development. For others, maintenance of complete birth registers was a significant advance on previous practice. Similarly,

UN agencies and government partners had been encouraged to think about monitoring through markers of quality and utilization of care, and not just inputs such as *numbers of staff 'trained'*.

It is our impression from the field visits, however, that application of the UN Process Indicator series at the facility level settings is not straightforward. Problems in consistency of definition, data collection, interpretation, and lack of knowledge of how to use the indicators as a management tool limited their utility.¹⁴ Even applied correctly, the meaning of the indicators themselves is open to question. Ronsmans et al (2002) drawing primarily upon their experiences of using such process indicators in the MotherCare projects, have highlighted some of the difficulties with the conceptualization and definition of indicators of service use such as caesarean section rate, and of met need for obstetric care.

There is more to be learned from AMDD's experience with the U.N. Process Indicators. As the AMDD experience is the most extensive so far on implementation of the UN indicators in a variety of settings, it is important that Columbia University (or an external consultant) undertakes a critical evaluation of that experience during the last year of AMDD and contributes to that wider debate.¹⁵

Another area of measurement overlooked by AMDD, but of critical importance, is the development of effective maternal mortality surveillance systems. Two recent efforts to develop surveillance systems provide convincing evidence of how they are intrinsic to monitoring outcomes, improving the quality of care, and mobilizing communities to become active partners in reducing maternal mortality.

The Healthy Mother/Healthy Child (HM/HC) Project in Upper Egypt instituted the Maternal Mortality Surveillance System (MMSS) to provide policy makers with vital information on the level, trends, causes and avoidable factors of maternal mortality. The decentralized system, together with continuously updated data, allows each governorate the ability to detect patterns of deaths and problems to be addressed to improve maternal/neonatal outcomes. Safe Motherhood Committees at the facility, district and governorate levels play a key role in the maternal mortality surveillance system and in planning and ensuring corrective actions are taken to improve outcomes. Mass media campaigns have also been carried out to educate families to be aware of danger signs during pregnancy and seek appropriate care when they occur. As a result of the system, the 2000 National Mortality Study was able to precisely establish the numbers and pinpoint the causes of maternal deaths:

- 81% of maternal deaths are caused by avoidable factors
- Health providers are responsible for 54% of maternal deaths due to poor diagnosis and case management, late referrals (often private sector) and misuse of drugs such as pitocin.
- Hemorrhage is the leading cause of death (30%), followed by eclampsia/pre-eclampsia (13%).
- In 50% of all maternal deaths, the fetus or infant also died.

¹⁴ In 2003 AMDD produced a detailed workbook giving guidance on some of the complicating issues (what to do about "cross border traffic" of service users between districts, population growth, double counting etc) but in practice there are considerable challenges in data collation and interpretation, and in many settings local knowledge of using such indicators was often limited. For the indicator series to be meaningful it requires initial mapping of all maternity facilities (public and private) for a specified geographically defined population and collation of data on certain activities from all of these. However the need for this mapping is implicit rather than explicit in the manual, and in some AMDD projects the data collation focus and input was not at district level but rather at the level of the facility where the improvements had occurred, and we found "population based" Met Need for EmOC, and c-section rates being inappropriately calculated at the level of single EmOC facilities (within multi-facility districts).

¹⁵ In a paper title, "The evidence for emergency obstetric care," (Paxton, Maine, Freedman, and Lobis 2003), the AMDD staff attempted to summarize how the U.N. Process Indicators were used in specific country settings to track distribution and certain aspects of utilization of EmOC services. The paper does not grapple with the advantages and limitations of the Process Indicators, or analyze AMDD's aggregate experience with them across the different countries.

The Government of Tanzania and the University of Newcastle engaged in a similar process to assess the impact of the government's strategy to reduce maternal mortality in the 1990s (Mswia et al 2003). They used a variety of data collection techniques at demographic surveillance sites to monitor specific causes of maternal mortality in three districts. The research explored the viability of extrapolating from the sentinel sites to a population-wide estimate of maternal deaths. The findings of the study were:

- Demographic surveillance produces reliable estimates of health outcomes
- Follow-up to quantitative data collections with verbal autopsies can increase the quality of the information
- Timely and appropriate use of obstetric care would prevent most deaths
- 70% of urban deaths and 50% of rural deaths took place in a hospital
- More than half of all deaths were in women in their twenties
- Educational level of the head of household had a major impact on maternal deaths (one additional year of educational attainment accounted for a 62 percent reduction in maternal mortality).

The study also revealed important findings about how data from surveillance systems compare with population-based surveys and census methods that use recall techniques. While the research did not establish whether it was possible to extrapolate to the national level based on sentinel sites, it did conclude, with follow-up methods and frequent verbal autopsies, demographic surveillance systems generate more accurate cause-specific mortality information than survey techniques (Mswia et al 2003:91-92). Finally, maternal mortality ratios were much higher in the sentinel sites than indicated by official regional estimates based on government statistics, emphasizing the significant underreporting of maternal deaths and the great value of community-based surveillance systems (Mswia et al 2003: 92).

Further research on the validity and feasibility of demographic surveillance systems would contribute to the objective of generating reliable maternal mortality monitoring systems to better ascertain the impact of safe motherhood interventions. This would also complement the IMMPACT Project, which is more focused on developing indicators.

Leadership and Focus

The energy and commitment of the core AMDD leadership and staff was clear to partners and to the evaluation team. There was a strong sense of mission and of camaraderie evidenced at the AMDD Network conferences. Some partners did express their unease about the leadership's "dismissive attitudes" to others' contributions in the safe motherhood domain. In particular, there was discomfort at leadership condemnation of alternative approaches to Safe Motherhood. The critical tone of the rhetoric diminished as the program matured. Most all of AMDD's implementing partners continued other types of interventions (with other funding) alongside EmOC activities funded by the program.

"Most of the implementing partners utilized AMDD resources and technical assistance to build on their existing community-level and health systems strengthening activities – which allowed for excellent leveraging of resources and programming strategies" (CARE).

The leadership of AMDD, in refusing to acknowledge how EmOC was additive rather than substitutive, missed an opportunity to examine the relative effectiveness of combining different components in different ways. They could have accomplished this without losing the focus of the program, which all agreed was critical to drawing attention to a EmOC as a long neglected essential component of programs aimed at reducing maternal mortality.

Although the tight focus of the AMDD on improving the quality of EmOC was appreciated by many, there was a widespread feeling that follow-on activities around emergency communication and transport and community awareness were still required in order for timely service utilization to be improved. With the RPMM Network, because the grants were generally for small amounts of seed money and the local groups were required to generate funding from other sources as a condition of the grant, a broader “three delays” approach tended to be taken within the plan of activities.

In the spirit of forging a more equitable and collaborative partnership, there is now an opportunity to reach out to a wider network of partners. In addition, funding operations research on a variety of approaches would permit controlled comparisons of different strategies in combination with EmOC to increase access and quality.

AMDD, IMMPACT, and Saving Newborn Lives position the Foundation to assume a worldwide leadership role in maternal health. As demonstrated by AMDD, the combination of an influential donor, a world-class research institution, and organizations with the implementation and technical operational know-how can go a long way in galvanizing political commitment and leveraging resources for reducing maternal mortality. Without this kind of strong leadership, it is doubtful that the next twenty years will produce any significant change in maternal health outcomes for the poorest women of the world, any more than the last twenty.

Documentation of Lessons Learned about the Implementation Process and Policy Reform

The program undertook little formal evaluation or regular analysis of what worked and what didn't as the programs were being implemented. Although three international conferences provided opportunities for learning and sharing of experiences, they engaged in relatively little organizational learning about the processes of partner selection, processes by which partners incorporated the AMDD approach into their other activities, application of the tools and technical assistance, or how they effected changes in management systems and policies. Clearly there are lessons to be learned about the relative success of the application of the Bangkok framework in different settings, either through the particular experiences of individual project partners (such as CARE's FEMME program which implemented the approach in five diverse settings), across AMDD partners in the same country (e.g. RPMM and CARE in Tanzania; UNICEF and UNFPA in India and Bhutan; UNICEF and RCHC in Pakistan), or with similar strategies in different countries such as among the women's groups working on human rights (e.g. SENDAS in Ecuador, Likhaan in the Philippines).

Similarly, despite a clear objective of promoting changes in healthcare systems, the program has yet to take advantage of opportunities to document these processes at different levels. In addition to the two national programs, several programs integrated the EmOC focus into processes of decentralization (e.g. India, Ecuador, Peru, and Mozambique).

The program has the opportunity to more effectively learn from partners' positive and negative experiences with leveraging political and financial resources for expansion of successful strategies. It was a weakness of AMDD that a clearly specified and *resourced* “policy change” component of work was not made a requirement of *all* participating projects, and the absence of this perspective reflects the absence of experienced policy specialists within the central Columbia team. This would need to be rectified in any follow-on activity.

The great flexibility of the project was a major strength of AMDD. The opportunity now exists to document the wealth of experiences in order to tease out lessons learned about successful and unsuccessful implementation strategies under the varying conditions in which the partners work.

RECOMMENDATIONS

Recommendation 1: Assume International Leadership on Maternal Health

That the Bill and Melinda Gates Foundation assume a leadership role on maternal health, especially with regard to the ambitious Millennium Development Goal for reducing maternal mortality by 75 percent by 2015.

Rationale for recommendation 1

Its key role in funding AMDD, IMMPACT, and the Healthy Newborn Partnership positions the Foundation to assume a worldwide leadership role in maternal health. As demonstrated by AMDD, the combination of an influential donor, a world-class research institution, and organizations with the implementation and technical operational know-how can go a long way in galvanizing political commitment and leveraging resources for reducing maternal mortality. Without this kind of strong leadership, it is doubtful that the next twenty years will produce any significant change in maternal health outcomes for the poorest women of the world, any more than the last twenty.

Despite the status as one of two millennium development goals (MDG) focused on women, the goal to “improve maternal health” has no single influential advocacy group or donor champion to promote commitment of resources and raise international awareness and interest. One of the principal limitations to maternal health advocacy is the lack of investment in programs to address maternal mortality and morbidity.

The Gates Foundation has taken an important leadership role in the fight to improve maternal health in poor countries. By funding AMDD the Gates Foundation took a bold step at a time that no other donor was prepared to take on the difficult challenge of maternal mortality on such a global scale. That investment by Gates in the five year AMDD program has had impressive results. AMDD has now established good conditions—the networks, expertise and enthusiasm and the policy environment—that are necessary to take this further forward. The signs are that continued investment in maternal health can effectively consolidate and deepen existing gains.

Recommendation 2: Convene a State-of-the-Art Summit on Responses to Maternal Mortality

It is recommended that the Foundation sponsor a maternal mortality summit to facilitate a "state of the art" review meeting on state-of-the-art Safe Motherhood & Newborn Health care options and measurement of outcomes. The Summit should include researchers, technical partners, donors, advocacy groups, and implementing agencies to consider the current state of knowledge on what works and why and how can these can be measured within health services and systems approaches to Safe Motherhood, what is currently missing, and what the next research questions might be.

Rationale for recommendation 2

Maternal mortality has not been viewed as a global priority worthy of adequate funding to address the magnitude of the problem. In part this is attributable to lack of consensus on what to do and lack of reliable data to demonstrate what works. In the past few years there is growing consensus on what works (see Gay 2003), but less agreement and research-based evidence on how to accomplish it and how to measure it. AMDD, as well as other programs (e.g., Healthy Mother/Healthy Child and Options), now have much to contribute to elucidating the “how”, and research projects such as IMMPACT can contribute to a dialogue on how to effectively measure outcomes. It is timely to bring together the best thinking on implementation, social mobilization, and measurement.

Recommendation 3: Integrate Research and Evaluation into Foundation-Supported Maternal Health Programs

Additional funding should support maternal health programs that integrate a more explicitly research-oriented and evaluatory approach into the programmatic work, encouraging partners to submit projects that are designed to test approaches toward implementation of EmOC, to compare alternative designs, and to document successes and failures from which lessons can be learned and documented. A similar analytical approach should be taken in policy work.

To maximize impact, while maintaining a powerful focus on EmOC, new programs should address critical obstacles to accessing services, such as inadequate transport, limited communications, lack of community awareness and mobilization, non-functioning referral systems, and other key barriers.

Rationale for recommendation 3

It is imperative that full advantage is taken of the opportunities to learn from the AMDD experience and to use these to better understand what works for whom in what setting. Some of these lessons will be specific to informing future Safe Motherhood policy and programming, and some will be generic lessons for global health movements. This may require bringing in new academic partners and policy experts.

AMDD is a high profile project that is highly regarded by diverse stakeholders with a very positive image worldwide and it is the only global program aimed at reducing maternal mortality. Continued investment in programs that aim to reduce maternal mortality would allow further improvement and consolidation to occur in the programs started by AMDD, as well as further roll-out in additional countries, and scale-up of AMDD and other programs to influence national strategies. The potential exists for more rigorous comparison of the conditions that support or inhibit progress. Several implementing partners have already leveraged additional resources to support this type of expansion and linkage to other components of maternal healthcare. Continued investment in implementation would also offer the possibility of fuller evaluation of the EmOC approach using the health outcome indicators and surveillance systems (see recommendations 5 and 6).

Recommendation 4: Incorporate a Focus on Neonatal Outcomes into Maternal Health Programs

In the future, Foundation funded maternal mortality reduction programs with an EmOC focus should incorporate practices that address a) neonatal outcomes and b) major indirect causes of MMR, such as Malaria, TB, Anemia, and HIV/AIDS (where they are a significant cause of mortality and morbidity). They should also build lateral relationships with other organizations working on these issues (e.g., with the Healthy Newborn Partnership).

Rationale for recommendation 4

Approximately a third of perinatal deaths are due to lack of access to emergency obstetric care and harmful obstetric practices. Therefore there is a strong rationale for addressing maternal and neonatal mortality in an integrated manner to benefit both women and neonates. AMDD is only a partial approach to addressing maternal mortality. The next challenge is to link the approach effectively with other critical elements of maternal health care. In some contexts it will also be appropriate to widen scope to include improving identification of cases and provision of care for women suffering from *indirect* causes of maternal mortality (for example severe anemia and cardiac failure due to malaria).

Recommendation 5: Support Improvements in Maternal Mortality Surveillance Systems

The Foundation should support programs that work toward improving maternal mortality surveillance, linked with entities such as safe motherhood committees and other innovative approaches that will hold facilities responsible for improving outcomes and maintaining high standards of quality of care. The program has an opportunity to build on effective models developed elsewhere (e.g. The Healthy

Mother/Healthy Baby Project in Egypt and University of Newcastle's research in Tanzania). Building on their experience with the process indicators, AMDD partners should also contribute to the development and improvement of local and national maternal and perinatal health management information systems (to encompass all area-level maternity services, private and public sector, and to improve monitoring of referral networks).

Rationale for recommendation 5

Good quality population- and local-level data on the causes of maternal and neonatal mortality are essential to effectively addressing and sustaining improvements in maternal and neonatal health outcomes. The use of UN Process Indicators by themselves did not yield adequate information at the local level for resource allocation and the most effective solutions for improving maternal and neonatal outcomes.

Recommendation 6: Promote Collaboration among Complementary Programs

The Foundation should actively encourage increased collaboration among its programmatic and research projects. In the future, the IMMPACT research project, also supported by the Gates Foundation, should take active steps to explore future collaboration with programs like AMDD. Capacity and willingness to collaborate should be a prerequisite of new programs.

Rationale for recommendation 6

The IMMPACT Project will be developing new maternal and perinatal health indicators for measuring the impact of national-level Safe Motherhood programs. Collaboration between a follow-on phase AMDD (or some other program that builds upon AMDD) and IMMPACT opens up the possibility of evaluating the health impact of the EmOC approach which has not been feasible up until now.

Recommendation 7: Promote Equitable Partnerships among Advocacy, Research, and Implementing Organizations

Future programs should move to a more collaborative partnership model and work towards more seamless relationships with the White Ribbon Alliance and with other partners on global activities that will have impact at international, national, and down to the local level.

Rationale for recommendation 7

Given the impressive global reach achieved by AMDD, new opportunities exist to strengthen the ties between international advocacy initiatives and program implementation. Previously the scale of advocacy efforts (e.g., White Ribbon Alliance and WHO) for the reduction of maternal mortality have not had strong and direct links to programs due to limited funding for the types of services crucial for addressing the major causes of maternal and neonatal death. It is important for AMDD to recognize that other groups offer skills and special expertise to complement their contribution. It would be in the interest of both AMDD partners and international advocacy organizations to collaborate in defining mutual interests and promoting effective and proven strategies, greater donor and government commitment, and increased allocation of resources.

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