Maternal and Perinatal Death Inquiry and Response

Unite for Children

Empowering communities to avert maternal deaths in India

United Nations Children’s Fund
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New Delhi, INDIA

www.unicef.org
“The most important reason for lack of progress in reducing maternal deaths is denial - we need more openness and clearer messages.”

Jens Stoltenberg, Prime Minister of Norway
At the launch of Tanzania’s ‘One Plan’ programme, April 2008
The current estimated maternal mortality ratio in India is 301 per 100,000 live births. This translates into about 80,000 pregnant women or new mothers dying annually often from preventable causes. The medical reasons for maternal deaths find their roots in interlinked social phenomena such as the low status of women in communities, poor understanding of the families on when to seek care, and inaccessibility of quality healthcare in rural areas. Although these social causes are more difficult to document, they must be addressed if we are to achieve the Millennium Development Goal of reducing maternal mortality by three quarters in 2015.

UNICEF is committed to working with the national flagship programme, National Rural Health Mission, to promote decentralised planning as a key strategy to lower maternal and child mortality. It is important to note that the success of decentralised planning rests on our ability to capture ground realities and feed this information back to communities and health systems for appropriate action. Since 2005, UNICEF has supported the Maternal and Perinatal Death Enquiry and Response (MAPEDIR) which is a powerful tool that systematically captures the ground realities of maternal deaths, analyses the underlying medical, social and systemic factors and finally uses this evidence to generate community and programme action.

UNICEF’s support to the MAPEDIR extends across select districts in Rajasthan, Madhya Pradesh, West Bengal, Jharkhand, Orissa and Bihar. Across these six states, the MAPEDIR has empowered communities to improve maternal health as well as influenced safe motherhood programmes at the local and state levels. The power of this initiative is underscored by several examples. It has led to a Community Based Obstetric Referral Initiatives (Obstetric Helpline) in Rajasthan, a district health system led initiative in Madhya Pradesh and the design of a referral transport scheme in West Bengal. As a result of the initiatives, thousands of women with obstetric complications have been transported to quality healthcare in these states. Many states have decided to broaden the outreach of these initiatives that will in turn save the lives of many more pregnant women and new mothers.

This document seeks to capture some of this extraordinary work hoping that it will inspire the use of the MAPEDIR to mobilise communities and influence programmes for safer motherhood everywhere. UNICEF remains committed to working for the development and participation of the women and children of India.

Karin Hulshof
Representative
UNICEF India Country Office

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1 India SRS Sample Registration System 2003.
This working paper recognises the contribution of frontline workers, doctors, district officials, self-help groups, NGOs, academicians and policy makers towards reducing maternal deaths at the state and national level in India.

We are grateful to Mr Naresh Dayal, Principal Secretary, Health and Family Welfare, Government of India, who was the driving force that inspired Maternal Health to become the pivot of RCH II and the NRHM.

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## ACRONYMS

<table>
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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ANC</td>
<td>Ante Natal Care</td>
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<tr>
<td>ANM</td>
<td>Auxiliary Nurse Midwife</td>
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<td>APH</td>
<td>Ante Partum Haemorrhage</td>
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<tr>
<td>ASHA</td>
<td>Accredited Social Health Activist</td>
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<tr>
<td>AWW</td>
<td>Angan Wadi Worker</td>
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<tr>
<td>BDO</td>
<td>Block Development Officer</td>
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<tr>
<td>BPHC</td>
<td>Block Primary Health Centre</td>
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<tr>
<td>BPL</td>
<td>Below Poverty Line</td>
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<tr>
<td>CDMO</td>
<td>Chief District Medical Officer</td>
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<tr>
<td>CEMONC</td>
<td>Comprehensive Emergency Obstetric and Newborn Care</td>
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<tr>
<td>CMHO</td>
<td>Chief Medical Health Officer</td>
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<tr>
<td>CHC</td>
<td>Community Health Centre</td>
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<tr>
<td>DFID</td>
<td>Department for International Development (a department of the UK Government responsible for promoting development and reducing poverty)</td>
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<td>DPM</td>
<td>District Programme Manager</td>
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<td>EOC</td>
<td>Emergency Obstetric Care</td>
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<td>FRU</td>
<td>First Referral Unit</td>
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<td>GOI</td>
<td>Government of India</td>
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<td>GOWB</td>
<td>Government of West Bengal</td>
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<td>ICDS</td>
<td>Integrated Child Development Services</td>
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<td>IEC</td>
<td>Information Education Communication</td>
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<td>IFA</td>
<td>Iron Folic Acid</td>
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<td>IIPS</td>
<td>International Institute of Population Sciences</td>
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<td>IMCI</td>
<td>Integrated Management of Childhood Illness</td>
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<td>IMNCI</td>
<td>Integrated Management in Neonatal and Childhood Illnesses</td>
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<tr>
<td>IMR</td>
<td>Infant Mortality Rate</td>
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<td>JSY</td>
<td>Janani Suraksha Yojana</td>
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<td>LHV</td>
<td>Lady Health Visitor</td>
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<tr>
<td>MBBS</td>
<td>Bachelor of Medicine, Bachelor of Surgery</td>
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<tr>
<td>MCH</td>
<td>Maternal and Child Health</td>
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<td>MDG</td>
<td>Millennium Development Goal</td>
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<td>MDI</td>
<td>Maternal Death Inquiry</td>
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<td>MMR</td>
<td>Maternal Mortality Ratio</td>
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<td>MOHFW</td>
<td>Ministry of Health and Family Welfare</td>
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<td>MPW</td>
<td>Multi Purpose Worker</td>
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<td>NHRM</td>
<td>National Rural Health Mission</td>
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<td>NFHS</td>
<td>National Family Health Survey</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
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<td>NPP</td>
<td>National Population Policy</td>
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<td>PHC</td>
<td>Primary Health Centre</td>
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<td>PRI</td>
<td>Panchayati Raj Institution</td>
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<td>PPH</td>
<td>Post Partum Haemorrhage</td>
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<td>PPTCT</td>
<td>Prevention of Parent to Child Transmission</td>
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<td>RCH</td>
<td>Reproductive and Child Health</td>
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<td>RGI</td>
<td>Registrar General of India</td>
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<td>RHS</td>
<td>Rapid Household Survey</td>
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<td>RMP</td>
<td>Registered Medical Practitioner</td>
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<td>SBA</td>
<td>Skilled Birth Attendance</td>
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<td>SC</td>
<td>Sub-Centre</td>
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<td>SHG</td>
<td>Self-Help Group</td>
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<tr>
<td>SRS</td>
<td>Sample Registration System</td>
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<tr>
<td>TOT</td>
<td>Training of Trainer</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<tr>
<td>UNICEF</td>
<td>United Nations International Children’s Emergency Fund</td>
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<tr>
<td>UP</td>
<td>Uttar Pradesh</td>
</tr>
<tr>
<td>VHW</td>
<td>Village Health Worker</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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The global maternal mortality ratio (MMR) remains unacceptably high. Worldwide, nearly half a million women die each year from complications during pregnancy and childbirth. About 99 per cent of these women belong to the developing world, with over 90 per cent concentrated in Africa and Asia. The tragedy is that almost every one of these deaths was avoidable.

Although some developing countries have shown progress, proving that given the required political will and commitment, reductions are possible within existing resources, India has yet to meet the world’s expectations in lowering maternal mortality risks to an acceptable level. The Government of India estimates India’s MMR currently at 301 per 100,000 live births (RGI: 2001-03 Maternal Mortality Report), down from 407 per 100,000 live births in 1997-98. Even so, across the country, more than 80,000 women die annually while pregnant, at childbirth, or soon after.

Given India’s vast size and socioeconomic diversity, national averages camouflage the vast differences between states and regions, town and country, and also between the poor and rich. Recent estimates suggest that two-thirds of maternal deaths in India occur in a handful of states – Assam, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, Uttaranchal and Uttar Pradesh.

It is an unfortunate fact that despite impressive economic growth in the rural hinterland where lives the vast majority of the Indian population, female health indicators have not yet changed noticeably.

Poor, powerless and pregnant women remain amongst the most vulnerable members of society. For far too long, the magnitude of the problem of maternal mortality remained unclear to policy makers because such deaths in many instances remained ‘invisible’. As in other developing countries where many maternal deaths are unrecorded, statistical estimates in India too tell only part of the story. Very often, no one knows how or why the women died.

The recognition that these deaths are not just unfortunate but unnecessary has come with better understanding among policy makers and public health practitioners of what contributes to maternal mortality. Globally, there is evidence that most maternal deaths can be averted but for the ‘three delays’ – (i) delay in decision to seek professional care, (ii) delay in reaching the appropriate health facility, and (iii) delay in receiving care after arriving at a hospital. Tackling and averting this trio of delays will help the world as also India to reduce the burden of maternal mortality.

In 2008, as the world takes stock of the progress and challenges in tackling issues surrounding safe motherhood, there is good news from India, a country with one of the highest number of maternal deaths. India is taking initiatives, which if successful, could decrease maternal mortality across the developing world. Among other issues, Maternal, Newborn and Child Health (MNCH) are now moving up the country’s policy agenda. Also, Safe
Motherhood is a top priority of the country’s National Rural Health Mission (NRHM) launched in 2005.

Significantly, district administrations no longer cite resources as a key constraint. Health service providers are attending training sessions to hone their skills and improve their knowledge base. Skilled Birth Attendants are getting trained, Primary Health Centres are being upgraded and First Referral Units (FRUs) getting vitalised. Also, efforts are underway to expand the cadre of skilled birth attendants and to tone up facilities for emergency obstetric care. These efforts are focused on 18 states with weak public health indicators and/or weak infrastructure.

Titled ‘Maternal and Perinatal Death Inquiry and Response‘ (MAPEDIR), this more recent initiative, incorporates the best practices and concepts from within India and elsewhere and attempts to translate them into action at the community level – sparking genuine change in understanding and tackling maternal mortality at the family, community, health service, and policy-making levels.

MAPEDIR’s genesis lies in UNICEF’s Maternal Mortality Reduction Advocacy Project, supported by the United Kingdom’s Department for International Development (DFID).

The MAPEDIR initiative underscores the need for information about the underlying causes of maternal deaths in remote and inaccessible villages. It grew out of UNICEF’s decision to support maternal death inquiry as a component of the ongoing second phase of the Reproductive and Child Health Programme (RCH II) and the unfolding National Rural Health Mission. RCH II emphasises on increasing the demand for quality healthcare and for greater community participation in the planning of public health interventions, while NRHM focuses on the imperative of making available Accredited Social Health Activists (ASHAs) in every village as mobilisers, skilled attendants at the time of childbirth, and 24x7 emergency obstetric care to deal with different levels of complexity.

The MAPEDIR initiative puts in place a process that uses a confidential inquiry tool to examine maternal deaths, generate local evidence, sensitise communities and health officials, and galvanise them into taking action to reduce such deaths. The new knowledge stemming from the scrutiny of maternal deaths in rural areas bridges a crucial gap. Typically, medical records capture only the immediate, biological causes of maternal deaths. The personal, familial, socio-cultural, economic and environmental factors contributing to these deaths are left out. MAPEDIR seeks to restore and record these missing links.

Piloted in Purulia, one of the poorest and most backward districts of West Bengal in June 2005, MAPEDIR is currently implemented in 16 districts in six Indian states with high maternal mortality. These are: West Bengal (Purulia); Rajasthan (Dholpur, Tonk, Udaipur); Jharkhand (Ranchi); Madhya Pradesh (Guna, Shivpuri); Orissa (Nuapada, Koraput, Kalahandi, Bolangir, Sonepur, Malkangiri, Nabarangpur, Rayagada; and Bihar (Vaishali). It is also in the process of being rolled out in Maharashtra and will be implemented in Assam and Haryana before December of 2008.

Over the past two years, trained in the MAPEDIR process, health and community workers and NGO field staff have visited families where a maternal death took place. The findings from their structured questionnaire (translated into the local language), enquiring minutely into the circumstances of the maternal death, have been widely shared with communities and with local health authorities, leading to a gratifyingly active response.

Beginning on a small scale in some districts, MAPEDIR is now gaining wide acceptance as a viable strategy for preventing maternal deaths by offering much needed data. One of the most heartening indicators of its success is community-initiated action to ensure safe motherhood. There is greater
awareness about the factors leading to maternal deaths as well as the relevance of birth-preparedness and complication-readiness. There is also greater willingness to contact and demand service from the healthcare delivery system. These are revolutionary ideas for rural, remote Indian communities that previously had minimal interface with the healthcare system. For instance, in Purulia, the referral initiative conceived by village leaders in one of the blocks is saving lives. In Dholpur (Rajasthan), village-level transporters have become part of the movement to reduce maternal deaths. These are but two examples of the dynamic potential and promise of MAPEDIR.

At the institutional level, the MAPEDIR process has spawned new strategic partnerships between government agencies, NGOs, academic institutions and the UN system. A collaborative initiative, it has elicited the involvement of several key institutions and groups including the Government of India, State Governments, District Administrations, Panchayati Raj (village-level institutions), women’s self-help groups, local non-governmental organisations (NGOs), medical faculties of Indian universities, the Johns Hopkins Bloomberg School of Public Health (USA), WHO, UNFPA and UNICEF.

The above links are generating greater awareness of existing government facilities and schemes for safe motherhood such as the conditional cash transfer scheme for Below Poverty Line women, the Janani Suraksha Yojana (JSY) in rural communities. Even in tribal-dominated districts where community structures may be lacking, MAPEDIR is acting as a catalyst and serving as an alert mechanism. Households deprived of education and other basic amenities are beginning to realise that delays at critical junctures can lead to maternal deaths. In many cases, the arrival of MAPEDIR interviewers in a village has sparked a sense of urgency among local authorities to modernise maternal care facilities by using Rogi Kalyan Samiti funds made available by the National Rural Health Mission. The tool has also underscored the need for better reporting of maternal deaths in states with weak healthcare systems and infrastructure.

As India takes determined strides towards achieving the fifth Millennium Development Goal of 109 maternal deaths per 100,000 live births by 2015, this working paper provides powerful evidence for advancing the MAPEDIR movement to save mothers and their children both within the country and beyond. It also looks at the challenges that remain. If best practices from the MAPEDIR-implementing districts are replicated more widely across the country, India and the world will move closer to the target of a 75 per cent reduction in maternal mortality by 2015, as set out in MDG5.

MAPEDIR AT A GLANCE

» Piloted at Purulia (West Bengal) in June 2005, MAPEDIR is currently implemented in 16 districts in six Indian states with high maternal mortality.

» The MAPEDIR tool, a detailed verbal autopsy questionnaire, captures missing links in officially recorded data so as to reconstruct the sequence of events and pinpoint the exact cause of a maternal death.

» The MAPEDIR initiative sensitises communities and health officials to issues concerning maternal health and galvanises them into taking long-term action to reduce maternal deaths.

» At the institutional level, the MAPEDIR process has spawned new strategic partnerships between government agencies, NGOs, academic institutions and the UN system.

» MAPEDIR marks the beginning a powerful movement to help India achieve its MDG5 of 109 maternal deaths per 100,000 live births by 2015.
The International Safe Motherhood Conference at Nairobi in 1987 was a landmark event. For the first time ever, the international development community focused on one of the most neglected issue of our times – the plight of women dying in pregnancy and childbirth. The Safe Motherhood Initiative, launched in Nairobi, aimed to halve maternal deaths by the year 2000. The initiative triggered significant changes in the thinking of policy makers and practitioners, and made safe motherhood a key component of interventions focusing on women’s health and rights. In September 2000, the United Nations Millennium Summit set a target of 75 per cent reduction of maternal mortality by 2015 in the form of Millennium Development Goal 5 (MDG5).

In ‘Women Deliver’ conference held at London in October 2007, more than 1,800 participants from 109 countries endorsing a final statement from 70 cabinet ministers and parliamentarians, pledged to make achievement of MDG5 “a high priority on the national, regional, and international agendas.” The ministers and parliamentarians also pledged to be advocates in their home countries for “increased commitment of financial and human resources” against maternal mortality and to accelerate the expansion of services for maternal and newborn health.

In India, MAPEDIR was introduced in June 2005. UNICEF partnered with governments, community institutions and academic faculties to pilot MAPEDIR in Purulia, one of the poorest districts in West Bengal. Since then, the project has expanded to cover 16 districts in six states with high maternal mortality. These are: in West Bengal (Purulia), Rajasthan (Dholpur, Tonk, Udaipur); Jharkhand (Ranchi); Madhya Pradesh (Guna, Shivpuri); and Orissa (Nuapada, Nabarangpur, Koraput, Malkangiri, Rayagada, Bolangir, Kalahandi and Sonepur). Bihar became the sixth state in India to launch MAPEDIR in June 2007. In 2008 it is being carried forward with implementation in the states of Maharashtra, Assam and Haryana.
“If new mothers thrive, it means that the healthcare system is working, and the opposite is also true…”

Most maternal deaths are preventable. Yet, more than half a million women die each year around the world from complications of pregnancy and childbirth.² Although pregnancy is not a disease, it does pose risks to the health and survival of a woman. These risks vary in magnitude. The risk of a woman dying because of pregnancy or childbirth ranges from one in six in Afghanistan and Sierra Leone, to one in 100 in India, and about one in 17,400 in Sweden. In the developed countries, because every pregnant woman has access to special care, pregnancy and childbirth rarely lead to death or disability. This is not the case in many developing countries where each pregnancy represents a journey into the unknown from which many women may never return.

Maternal loss impacts child survival irreversibly. One million children are left motherless each year. These children are 10 times more likely to die within two years of their mothers’ death³ as compared to those who flourish in maternal love and care.

In addition to maternal deaths, for every woman who dies in childbirth, around 20 more suffer injury, infection or disease – approximately 10 million women each year.

INTRODUCTION

MATERNAL MORTALITY: CAUSES AND COMPLICATIONS

Causes of maternal death, global

<table>
<thead>
<tr>
<th>Cause</th>
<th>Percentage</th>
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<tr>
<td>Obstructed labour</td>
<td>11%</td>
</tr>
<tr>
<td>Eclampsia</td>
<td>16%</td>
</tr>
<tr>
<td>Unsafe abortion</td>
<td>18%</td>
</tr>
<tr>
<td>Infection</td>
<td>21%</td>
</tr>
<tr>
<td>Haemorrhage</td>
<td>34%</td>
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Source: WHO, 2005

In Asia, five direct complications account for more than 70 per cent of maternal deaths in Asia: Haemorrhage (31 per cent), Sepsis/ infection (12 per cent), unsafe abortion (6 per cent), Eclampsia (very high blood pressure leading to seizures – 9 per cent), and obstructed labour (9 per cent).⁴ Severe anaemia is a critical underlying factor and indirect cause of maternal deaths in India as in most parts of South Asia. Most maternal deaths occur between the third trimester and the first week after delivery. Studies further indicate that mortality was more than 100 times higher on the first day and 30 times higher on the second day after birth than in the second year postpartum. Mortality rates can be especially high after an abortion or stillbirth. While these are the main causes of maternal death, the fundamental reasons are unavailable, inaccessible, unaffordable, or poor quality care (see Box 1).

ASSESSMENT

Despite global concern, a key problem in tackling maternal mortality is how to accurately monitor it and obtain reliable comparable data. Ascertaining maternal mortality is notoriously difficult except where there is comprehensive registration of deaths and causes of deaths. As most developing countries have weak vital registration and health information systems, they cannot provide an accurate assessment of maternal mortality. On the other hand, an estimate derived from the more complete vital registration systems such as those in developed countries, suffers from misclassification and under-reporting of maternal deaths.

REDUCING MATERNAL MORTALITY

Reducing maternal deaths has been a slow process. Evidence gained from past experience globally suggests that a reduction of 75 per cent in the Maternal Mortality Ratio (MMR) is achievable within a 25-year timeframe.

Where significant reduction was achieved, it was done mostly through the provision of professional midwifery care at birth and improved access to hospital care. These measures enabled all industrialised countries to reach an MMR of 20 to 30 deaths per 100,000 live births as early as 1960. Many developing countries too, have

Box 1: Tracking and tackling complications related to pregnancy deaths

Globally, the most common complication leading to maternal death is post-partum haemorrhage (heavy bleeding after delivery). Sepsis, hypertensive disorders of pregnancy, especially eclampsia, complications of unsafe abortion and prolonged or obstructed labour claim further lives. These complications can occur during pregnancy and childbirth without forewarning. Some root causes for maternal risk can, however, be traced back to girlhood. In the developing world, chronic malnutrition stunts growth and severely malnourished women are vulnerable to obstructed labour. Anaemia puts a woman at risk of sepsis during delivery, and when haemorrhage occurs, she is less able to cope with the physiological stress. Under-age marriages and motherhood also make for risky childbirth. The factors that cause maternal morbidity affect the survival chances of the foetus and newborn, leading to an estimated 8 million perinatal deaths a year (over half of them foetal deaths) occurring just before or during delivery, or in the first week of life.\(^5\)

As demonstrated by a growing number of countries, skilled care at delivery backed up by referrals to timely emergency obstetric care is one of the key elements necessary to reduce maternal mortality. Eastern and South-Eastern Asia and Northern Africa have made the greatest headway, with increase in attended births of from 55 per cent to almost 80 per cent. But currently, only 46 per cent of deliveries in sub-Saharan Africa, where almost half the world’s maternal deaths occur, are assisted by skilled attendants. In Southern Asia, the proportion is even lower.

Maternal Mortality Ratio (MMR) is defined as the number of maternal deaths per 100,000 live births due to causes related to pregnancy and within 42 days of termination of pregnancy, regardless of the site or duration of pregnancy.

shown impressive progress, albeit over varying time frames.

Thailand substantially reduced its MMR from more than 400 in 1960 to 50 in 1984. Malaysia and Sri Lanka also saw declines in MMR of over 50 per cent during the same period. Starting from a lower baseline ratio of less than 200, both Egypt and Honduras halved their MMR in less than 7 years! A substantial decline also took place in Matlab, Bangladesh where MMR dropped from around 600 in 1976 to 200 in 2001. In contrast, sub-Saharan Africa and some countries in South Asia with high current levels of maternal mortality have shown considerably less or virtually no progress.6

A substantial decline also took place in Matlab, Bangladesh where MMR dropped from around 600 in 1976 to 200 in 2001. In contrast, sub-Saharan Africa and some countries in South Asia with high current levels of maternal mortality have shown considerably less or virtually no progress.6

The United Nations Millennium Development Goals (MDGs) Report 2006 clearly states that though the issue has been high on the international agenda for two decades, ratios of maternal mortality seem to have changed little in regions where most deaths occur (sub-Saharan Africa and Southern Asia). In developing countries, one in every 11 women dies of pregnancy related complications compared to 1 in 5000 in developed countries (WHO, 2004).

GOALS ACHIEVABLE DESPITE RESOURCE CRUNCH

Being poor, powerless and pregnant is life threatening. However, a decline in maternal deaths is achievable even in comparatively low-resource settings provided a country treats it as a public health priority. As Cuba, Egypt, Honduras, Malaysia, Thailand and Sri Lanka have convincingly demonstrated, a high GNP is not necessary to reduce maternal mortality, and developing countries do not have to wait for economic prosperity before they take steps to address the ongoing tragedy of maternal mortality. The success of these countries is attributed to a combination of factors including long-term investment in midwifery training and referral hospitals; free healthcare and a supportive system with regulation, control, and supervision of the medical and midwifery profession; and an effective monitoring mechanism to track progress. Much of this progress has gone hand in hand with community and women empowerment.

UNSAFE MOTHERS IN INDIA

India accounts for 23 per cent7 of the global burden of maternal deaths based on latest available 2005 global data. The current estimate of an MMR of 301 by the Registrar General India (2001-2003), translates to approximately 80,000 women dying each year due to pregnancy related complications. Regional disparities in MMR burden some states more such as Madhya Pradesh, Rajasthan and Uttar Pradesh than others (Kerala and Tamil Nadu) as seen in Table 1.

SOME STARTLING STATISTICS

- Every 5 minutes, one woman somewhere in India dies from complications of childbirth.
- 15 per cent of all pregnant women in India develop life-threatening complications.
- 65 per cent deliveries occur at home.
- 60 per cent of all maternal deaths occur after delivery but only 1 in 6 women receives postnatal care.

Embedded in pockets of deprivation, whether in the economically weaker states or population

7 Maternal Mortality in 2000: Estimates developed by WHO, UNICEF and UNFPA.
groups, these huge disparities in MMR are attributable to sharp differences in access to skilled birth attendants, emergency obstetric care, prenatal care, levels of anaemia, female literacy and other factors affecting the status of women. Ranked among the five countries that have less than 50 per cent deliveries assisted by skilled attendants,\(^8\) India is a prime candidate for and contributor to high MMR.

**WINDOW OF OPPORTUNITY**

Fortunately, there is growing realisation among policy makers that maternal death has been a ’tolerated’ tragedy for far too long, and that most such deaths can be prevented. The resources are there, as are innovative ideas to save the most vulnerable mothers and children in remote, rural areas. Replicating and disseminating good practices in addition to saying ‘No’ to maternal mortality will enable India to overcome this ongoing tragedy. Timely detection and effective management of the problems related to safe pregnancy and delivery are certain to help lower India’s MMR, in turn enabling the world to achieve the targeted global reduction in maternal risks and deaths. In that way, India seems uniquely and significantly positioned to contribute to a global reduction in maternal deaths.

Blessed with this window of opportunity, India has already taken significant steps. The National Rural Health Mission (2005-2013) prioritises maternal and child health. It offers incentives to families and health workers to encourage institutional deliveries. The ongoing second phase of the Reproductive and Child Health Programme (RCH II), which comes under the NRHM framework emphasises increasing the demand for quality healthcare and for greater community participation in the planning of public health interventions, especially in rural areas in the economically underprivileged and under-performing states. RCH II also stresses the need for creating a decentralised evidence base for more focused planning and innovations in this field.

**TRACKING MISSING LINKS FOR NEW KNOWLEDGE**

Since 2002, UNICEF has played an important role in the generation of new knowledge that can contribute significantly to solving time-worn problems besetting maternal and child survival in the country. It is working with the Government of India, State Governments, District Administrations and other partners to help demonstrate what works at the community and district levels, and to scale up interventions by extracting lessons learned and framing them into inputs for policy development.

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Building a reliable database and grasping the factors underlying high maternal mortality are critical to reducing India’s high MMR. Existing data on the incidence and trends in maternal mortality are inadequate. Moreover, the data on maternal deaths gathered through the country’s vital registration and health information systems are not able to capture the full scenario or “tell the whole story”, leading to the loss or impairment of a pregnant woman’s life. More detailed investigations are needed to identify the underlying causes of these deaths and to find out ways of dealing with them.

One of the most promising initiatives in this context is MAPEDIR or Maternal and Perinatal Death Inquiry and Response, which is a tested method of finding out the medical causes of death and ascertaining the personal, family or community factors that may have contributed to the death of a pregnant woman. Using a verbal autopsy tool to support a community-based social audit, MAPEDIR is identifying the underlying causes of maternal deaths in selected districts in India since 2005. The evidence gathered through MAPEDIR is now being used by policy makers and communities to develop initiatives that save mothers and children.

Each maternal death is a tragedy but the bigger tragedy is failing to learn lessons from an avoidable maternal death. A systematic analysis of MAPEDIR data provides both qualitative and quantitative insights into the cause of death, its relationship to pregnancy, preventability and the contributing problems. This information forms a guide to the development of interventions and policy and action at all levels.

THE WHYS AND WHEREFORES OF ACTION

» The health and wellbeing of mothers and their newborns are true indicators of the efficacy of the healthcare system in a country.
» India, with one of the highest MMRs of 301, accounts for 23 per cent of the half million maternal deaths worldwide.
» Statistics recording the biological causes of maternal deaths fail to reveal the underlying personal, familial, socio-cultural, economic and environmental factors leading to them.
» MAPEDIR or Maternal and Perinatal Death Inquiry and Response, initiated by UNICEF in 2005 seeks to restore and record these vital missing links.
» MAPEDIR is a standardised measurement and monitoring verbal autopsy tool which examines maternal deaths, generates local evidence, sensitises communities and galvanises health officials and policy makers into taking effective action to reduce such deaths.
» Decline in maternal deaths is achievable even in comparatively low-resource settings provided a country treats it as a public health priority. This was amply demonstrated by Egypt, Honduras, Malaysia, Sri Lanka and Thailand which reduced their MMR by 50-85 per cent in periods ranging from 7 to 24 years.
» India, recently equipped with the tried and tested MAPEDIR tool, is taking initiatives which if successful, could be replicated and contribute substantially towards making MDG5 of attaining 75 per cent reduction in maternity deaths by 2015 a distinct reality.
» Buttressing locally available data with insights culled from the MAPEDIR tool is an important method for achieving success in reducing maternity deaths.
Maternal mortality is a powerful pointer to the outreach and quality of health services. Statistics of maternal deaths, however, reveal only a partial story of why those deaths occurred and whether they could have been prevented. Only a thorough examination of all the factors – social, cultural, biological and medical – that led to the maternal deaths can present a comprehensive picture and a reliable database to address the issues underlying this scourge.

The levels of maternal mortality vary greatly across countries due to variation in access to emergency obstetrical care, prenatal care, anaemia rates among women, education levels of women, and many other factors. Investigations carried out in various studies in different countries suggest that women’s low status and lack of decision-making power are major factors influencing maternal survival. Illiteracy and lack of awareness also seriously affect timely access to maternal healthcare.

Women and their families are ill-informed about the signs of complications and when and where to seek care. As a result, they are unable to access care when complications arise. Added to this, lack of resources to afford the required care, absence of transportation to reach an appropriate care facility in time, inadequacy of medical services leading to delay, or faulty treatment on the whole, are major contributors to maternal mortality. As things stand, public health facilities are of deplorable quality in the poor, rural, remote, tribal or geographically inaccessible areas. Often, lack of blood and vital drugs; insufficient numbers of health personnel and hospital beds; mismatches in the distribution of health centres and service providers, and delay in admitting or treating the patient all impair the pregnant woman’s health and chances of survival. In some cases, serious errors of judgment worsen the already grim maternal health and survival scenario.

An accurate understanding of the situation is called for. Most maternal deaths can be averted but in order to do so, the right kind of information is needed to understand the underlying factors that lead to the deaths. Only then can effective actions be taken. Each maternal death has a story to tell and can suggest practical ways of addressing the problem. Aggregating the findings from several deaths conveys a picture of the overall situation in a locality or population group that can help communities to determine lacunae and act on avoidable factors that contributed to the deaths. MAPEDIR helps to communicate this vital information to all stakeholders such as administrators, health planners, medical professionals, the community and women of reproductive age. It aims to build and influence public policy for it to be translated into public health practices at all levels, including the health system, the community and the individual (see Box 2).

**MAPEDIR: A SEARCHLIGHT AND A BEACON**

MAPEDIR is an investigative tool which seeks to kindle the community’s participation in probing why women died in pregnancy, delivery or soon after, with an emphasis on developing feasible solutions to the identified problems. The entire process includes identifying and investigating maternal deaths, sensitising the community, galvanising communities and health systems into action, and monitoring and adjusting interventions through continuing inquiries.

The MAPEDIR tool is a structured verbal autopsy questionnaire used to interview relatives and/or those who were close to the deceased woman. The findings can be aggregated, and, based on the inferences drawn, corrective action taken at the block, district, state and national levels. Several countries including India have used the inquiry method to better understand the causes and complexities of tackling maternal mortality (see Box 3). Such inquiries
Box 2: Evaluating the delaying factors contributing to maternal deaths

WHO describes five main approaches to evaluate the delays: (1) **community-based maternal death reviews** conducted at the community level to ascertain common community factors that may have contributed to the maternal deaths, and to act upon the findings; (2) **facility-based maternal death reviews** conducted at the facilities by the providers as in-depth investigations of the causes of and circumstances surrounding maternal deaths with the primary objective of improving the quality of care; (3) **confidential enquiries** that constitute systematic multi-disciplinary anonymous investigations of maternal deaths within a region or country. These help to identify the numbers, causes and associated remedial factors; (4) **surveys of near-misses or survivors** of obstetric complications for ensuring improvements in maternal care; and, (5) **clinical audit**, a quality improvement process that seeks to improve patient care and outcomes through a systematic review of various aspects of the structure, processes and outcomes of care against explicit criteria and ensures the subsequent implementation of change.

Different approaches have been used across the world, including India, to evaluate the delays in both community and facility settings. Experience in the use of these approaches has shown that successful implementation can take place at all levels. **A commitment to act upon these findings is a key prerequisite for success.**

Box 3: Maternal and child death investigations undertaken by countries

Maternal and child death inquiries have been conducted in many settings. Some examples include: (1) the routine practice of maternal death review by medical practitioners in the United Kingdom for more than 50 years; (2) hospital-based perinatal death reviews encouraged by the American College of Obstetricians and Gynaecologists in the United States; (3) community and hospital inquiry into all maternal deaths required by the Sri Lanka Ministry of Health since 1985; (4) the community verbal autopsy and hospital-based confidential inquiry of maternal deaths encouraged by the Philippines Ministry of Health; and (5) maternal death reviews supported by WHO in selected hospitals of Bangladesh, Myanmar and Nepal. In India, the Tamil Nadu Reproductive and Child Health Programme has reviewed all maternal deaths and a sample of infant deaths since 2003, and the Government of Kerala has reviewed all maternal deaths since 2005. In addition, WHO has supported maternal death reviews at Safdarjung Hospital in Delhi and at Christian Medical College in Vellore.

THE GOAL

The sole purpose of MAPEDIR is to learn from past tragedies and save lives in future without blaming anyone. Community-based maternal death...
inquiry ascertains the personal, familial, social and community factors that contributed to the maternal deaths with a view to take positive action toward improvement, and never to provide the basis for legal action, punishment or blame. A fundamental principle of this approach is providing a confidential, non-threatening environment in which to describe and analyse the factors leading to adverse maternal outcomes. Ensuring confidentiality when sharing the findings of the death inquiries with and outside the community leads to an openness in reporting which provides a more complete picture of the precise sequence of events leading to the death.

The collected data is aggregated, periodically analysed and interpreted. The resultant findings help define the problem, determine its scope, identify the biological and socioeconomic reasons contributing to maternal deaths, and determine the interventions crucial to address the problem and prevent future recurrence. Whether at the micro or macro level, MAPEDIR focuses on making maternal mortality a household, community and national health priority. Expected outcomes involve policy changes and stronger health systems.

MAPEDIR IN INDIA

Maternal death inquiry has been used in many countries for many years as a way to identify medical and social factors contributing to maternal deaths. The focus, however, has mostly been institutional. The information gained from the inquiries has been used in various ways, e.g. to correct deficient medical practices, advocate for requisite improvements in healthcare and systems, raise community awareness, etc. However, in developing countries, especially India, where millions of women still deliver at home and where a significant number of maternal deaths take place outside the realm of health facilities, a combined community/facility approach is vital. Better reporting of maternal and perinatal deaths is necessary throughout India, to make these deaths more visible to the community and policy makers, and to provide the much-needed evidence about the underlying causes of these deaths in order to develop focused and effective interventions. MAPEDIR is part of the effort to ask the right questions to the right people.

PHASED IMPLEMENTATION

The MAPEDIR tool, a structured verbal autopsy questionnaire, was suitably developed prior to its initiation in Purulia (West Bengal) in January 2005. It was translated into Bengali and Hindi, adapted to suit local conditions – factoring in cultural and linguistic specificities – and field-tested. (Subsequently, MAPEDIR was extended to four other states in a similar manner).

On June 22, 2006, representatives from the Government of India, international development partners, academics, NGOs, UNICEF and government representatives from the five states implementing MAPEDIR (Jharkhand, Madhya Pradesh, Orissa, Rajasthan and West Bengal) gathered in New Delhi to review the process and its outcomes, share experiences, learn from each other, and chalk out a roadmap for the future. Following this, the MAPEDIR process was initiated in each of the five implementing states with a workshop aimed at sensitising state and district administrations. The project’s partner NGOs helped mobilise communities, Panchayati Raj institutions, village health communities, self-help groups, and village councils. A series of TOTs (Training of Trainers) and training sessions for interviewers were conducted in the MAPEDIR districts from January 2005 to February 2006. Interviewers were selected from among Auxiliary Nurse Midwives (ANMs), ANM supervisors/Lady Health Visitors (LHVs), ICDS supervisors and NGO members.

In each of the implementing states, MAPEDIR had to be localised. This meant not only translating the verbal autopsy questionnaire into the local
language, but also tailoring the messages to fit the local medium of communication. For example, in Jharkhand, folk plays were and still continue to be staged in village markets to sensitize communities about the need for birth preparedness.

Objectives of MAPEDIR

- Sensitising communities to maternal and perinatal health issues, including the need for birth preparedness and complication readiness;
- Inquiring into maternal and perinatal deaths by identifying recent maternal deaths and conducting community-based inquiries with close acquaintances of the women so as to find ways by which future deaths might be prevented;
- Sharing the findings of the death inquiries with communities and helping them interpret the data to develop appropriate interventions, as also advocate for improvements in healthcare to tackle identified problems; and,
- Using the findings of the inquiries to advocate with policy makers for necessary improvements in healthcare systems.

SCOPE

The primary scope of MAPEDIR is to examine all maternal and perinatal deaths (i.e. intrauterine deaths from 24 weeks gestation) and each live birth resulting in a neonatal death (up to 28 days of life). However, currently, the scope has been expanded to effectively examine all maternal deaths.

OUTCOMES

Interviews at the household level conducted under the MAPEDIR project in selected districts in India identified the immediate, intermediate and underlying causes of maternal deaths. The interviews revealed that the immediate causes of maternal mortality most often are anaemia, eclampsia, haemorrhage, sepsis, obstructed labour and unsafe abortion. Intermediate and underlying causes that emerged from the interviews were the first and second delays in care-seeking, in turn caused by the low social status of women, lack of awareness and knowledge at the household level, inadequate care-seeking and resources, and inadequate access to quality healthcare (see Box 4 for case stories).

As in many other projects, after initial resistance, support for the MAPEDIR project has grown (see Box 5 for favourable impressions of some key public health officials).

ROLE OF KEY PLAYERS

A maternal death is the outcome of a chain of events and disadvantages throughout a woman’s life. In populations with shockingly low female and overall literacy rates, sensitising communities about basic issues influencing maternal and child health becomes a critical prerequisite before maternal death reviews can be conducted. As previously noted, in most parts of India, barriers to accessing maternal health services include the absence of requisite knowledge and power to decide when to seek help; the unavailability of means of transportation to a health centre; and the unaffordable cost of healthcare. The above factors are magnified in the more traditional households where adolescent girls and young married women have little power to influence decision-making within their families or vis-à-vis the wider world.

To raise awareness about these issues and heighten the visibility of the causes precipitating maternal deaths is a collective responsibility. Fully aware of this collaborative aspect, from the very beginning, UNICEF has teamed up with other international and national agencies, civil society networks and their affiliates to create a supportive environment in
Box 4: Relevance of MAPEDIR in India

- A 25-year-old woman delivered at home; developed haemorrhage soon after birth. Family members sought the help of a local ‘practitioner’ (quack) who gave some injections and medicines. The woman was not taken to a hospital and died soon after at home.
- A 30-year-old woman suffered from headache, blurred vision and swelling of feet during her ninth month of pregnancy. Her family sought the advice of a village quack who lived close by because there was no money to go to the hospital. The woman delivered twins at home and became semi-conscious. The family again consulted a quack and the woman was finally referred to a community health centre. The CHC referred her to the district hospital but the woman died before transport could be arranged.
- A 22-year-old woman delivered at home with the help of an untrained dai. She developed post-partum haemorrhage and was taken to the CHC. Thereafter, she was taken to the home of the provider who was treating her and administered IV fluids. Halfway through the treatment, the drip was taken off and the family was advised to take the woman home as she was ‘going to die’. The woman was taken home and died the next day.

which maternal death inquiries can be conducted. Not surprisingly, at the core of MAPEDIR’s success and sustainability lies the involvement of the local administration with the process. In districts where the administration values the tool and has invested human and financial resources to make it work, results are encouraging. Conversely, where the local administration is apathetic and the health system weak, even though MAPEDIR enlists the support of NGOs, it is found that in the long run, responsible contribution from the district health authorities is critical to scale up and sustain operations.

PARTNERS IN PROGRESS

Partnerships expand possibilities. As in the broader health and development fields where multi-pronged strategies are being attempted, formal and informal partnerships at various levels are critical to the success of the MAPEDIR process. An exciting collaborative effort, MAPEDIR is successfully involving several institutions and groups with different strengths: the Government of India, State Governments, District Administrations, Panchayati Raj (village-level institutions), women’s self-help groups, local NGOs, medical faculties of Indian universities, the Johns Hopkins Bloomberg School of Public Health (USA), and UNICEF. Communities are involved in the investigative process through partnering with NGOs and mobilising the Panchayati Raj Institutions, Village Health Committees, Self Help Groups and Gram Sabhas.

Good practices from countries that have reduced maternal deaths show that strategic linkages between individuals, communities and institutions are critical to achieving targets. It is also widely
known that to reduce maternal and newborn mortality and morbidity, it is essential to build a continuum of care that encompasses access to skilled care during pregnancy, childbirth and the post partum period. The care received at home needs to be extended to care provided by a skilled health professional at the primary care level, followed by the care provided at the referral facility for women and newborns with complications. No single agency can cater to the entire spectrum. That is why globally, UNICEF’s MAPEDIR initiative works with Governments, other members of the UN family – UNFPA (Safe Motherhood) and WHO (Making Pregnancy Safer Initiative) and other partners to ensure women’s right to reproductive health and survival. In India, MAPEDIR is an integral part of the national effort to reduce maternal deaths.

**Box 5: MAPEDIR, a blessing in disguise**

“If we have a better idea of the grassroots factors causing maternal deaths, we can plan better, use our human resources better and use our funds better... If the causes can be pinpointed, MMR and IMR can be tackled. MAPEDIR is a tool which can help us use our manpower better, strengthen our health structures and implement our programmes better. It will help us pinpoint our shortcomings. Without a system like MAPEDIR, our efforts to reduce maternal deaths will remain half-measures...”

**Dr Santosh Mishra**  
Deputy Director (Nutrition) and Nodal Officer, Navajyoti Scheme, Orissa

“Unless we know the main reasons for maternal deaths, we cannot take effective measures to tackle them. It is critical to be able to pinpoint the delays causing loss of lives. The traditional system did not deal with these issues adequately – there were gaps in information. Now, using MAPEDIR, we can find out if the deaths are due to delays in decision-making at the household level, or due to lack of transport or at the facilities or if they are the cumulative outcome of all three...”

**Dr SP Yadav**  
Director (RCH), Directorate of Medical and Health Services, Rajasthan

“Initiating the MAPEDIR process has improved reporting of maternal deaths in Monthly Reports; the process of investigation is creating awareness among family members and other villagers; the BPHNs and ICDS supervisors are motivated and showing a lot of interest in carrying out the interviews; there is good cooperation from the household members of the deceased women; the sensitisation at the level of Gram Panchayats is creating awareness about maternal deaths and women Gram Panchayat members are also showing a lot of interest. The types of delays and the causes are coming out clearly from the interviews...”

**Dr BB Patra**  
Chief Medical Officer of Health (CMOH), Purulia at the State Consultation on Maternal Death Review at Kolkata, 25 September 2006
Women’s low status and illiteracy, along with lack of awareness, physical and financial resources and decision-making power, are the main impediments to women in developing countries like India accessing the required medical care for successful childbirth.

Absence of adequate health facilities further compounds the problem.

An accurate understanding of the situation with the help of the MAPEDIR tool facilitates stakeholders like administrators, health-planners, medical professionals and the community to devise effective strategies for averting maternal deaths.

MAPEDIR, suitably moulded to encompass local conditions and complexities, ensures confidentiality and forms a basis for positive action towards all-round improvement in the care received by a pregnant woman.

Based on the aggregated findings of MAPEDIR, inferences can be drawn for corrective action at the block, district, state and national levels.

The crucial relevance of MAPEDIR in the Indian milieu and the response generated by its arrival in the country are amply demonstrated by the enthusiastic testimonies of government officials in different states.

The ultimate aim of reducing maternal deaths drastically can only be attained by a sustained collaborative effort involving individuals, communities, district administrations, village-level institutions, local NGOs, medical faculties of universities, State Governments, the Government of India, and international organisations like UNFPA, WHO and UNICEF.

Remedial measures at different levels are facilitated by MAPEDIR, which seeks to pinpoint the exact causes of maternal deaths and shares the data collected with various concerned agencies.
“MAPEDIR was conceptualised to cover perinatal deaths as well. But we decided to start small and prioritise. In the first stage, we decided to cover maternal deaths. Government and UNICEF officers pre-tested the questionnaires in the field, modifying the length and complexity along the way. Investigation of perinatal deaths may be introduced at a later stage, when the methodology stabilises and is adopted institutionally by state governments. Second, MAPEDIR was originally a scientific investigation tool meant for research. It was adapted to be transformed into a tool for action, eliciting community empowerment and system responsiveness.”

Dr Marzio Babille
Chief of Health, UNICEF India
MAPEDIR: A COMMUNITY EMPOWERMENT INSTRUMENT
“When UNICEF decided to support maternal death inquiry, they felt it would be useful to focus on community participation to maximise the use of any interventions that were developed as well as to increase awareness... This would also promote commitment of the political and health systems... It was vital to maintain confidentiality, from an ethical standpoint to protect individuals (the questionnaire respondents and families) as well as to promote the communities’ trust in our intentions... Developing a standardised approach would help implementation.” Dr Henry Kalter, an international expert in verbal autopsy instruments from Johns Hopkins Bloomberg School of Public Health, Baltimore, USA.

As mentioned, MAPEDIR is a verbal autopsy tool that encourages community participation as well as strengthens the health system to better tackle the risk of maternal death. Maternal death inquiries are conducted in the community as an entry point to learn what went wrong and to understand issues of practices and care at the household level, maternal access to routine maternal and newborn healthcare, transfer to and cost of referral services, provision of care at referral unit, and other key factors bearing on maternal survival.

MAPEDIR is aimed at providing an understanding of the contributing factors that could and should be used by decision-makers and stakeholders to address obstacles to quality obstetric care and to identify ways to prevent avoidable deaths. It seeks to find out the pattern of obstetric and socio-demographic variables related to maternal deaths and aims to provide guidance on what needs to be done to prevent future deaths. MAPEDIR also discovers and creates awareness of the underlying factors and barriers related to care-seeking for complications that lead to these deaths. It focuses on finding out exactly why mothers die. For example, is it because mothers are unaware of the danger signs in pregnancy or unaware of the need to seek care? Or is it lack of decision-making to seek services? Are the required services inaccessible because of distance, cost, or transport barriers? Answering such questions and taking action is the most important aspect of MAPEDIR.

THREE-HURDLE RACE AGAINST DEATH

MAPEDIR utilises a 3-Delays framework to identify the social, cultural, economic, medical and other factors responsible for maternal death. It helps the health system to target interventions and prevent maternal mortality at every stage. In most instances, women who die in childbirth are found to have experienced at least one of the following three delays:

- **The First Delay** is the delay in deciding to seek care for an obstetric complication. This may occur for several reasons, including late recognition that there is a problem, fear of the hospital or of the costs that will be incurred there, or the lack of an available decision maker.

- **The Second Delay** occurs after the decision to seek care has been taken. There is delay in coordinating the method of transportation, resulting in a delay in reaching the care facility. Many villages have very limited transportation options and poor roads linking the villages to maternal healthcare and referral facilities.

- **The Third Delay** is the delay in obtaining care at the facility. This is one of the most tragic issues affecting maternal survival. Often women have to wait many hours at the referral centre because of poor staffing, prepayment policies, or difficulties in obtaining blood supplies, equipment or an operating theatre.

The third delay is an area that many planners feel is the easiest to correct. Once a woman has actually reached an Emergency Obstetric Care facility, many economic and socio-cultural barriers have already been overcome. Focusing on improving services in the existing centres is a major component in promoting access to quality emergency obstetric care.
**METHODODOLOGY**

MAPEDIR is organised at the block and district levels. In most states, a death notifier initially investigates community reports of deaths of women of reproductive age and transmits his/her findings to the block-level MAPEDIR team supervisor. S/he assesses each report and assigns the suspected maternal deaths for a MAPEDIR interview. Interviewers in most states have chosen to work in teams of two, with one serving as the interviewer and the other as the data recorder. The two interviewers and their supervisor comprise the block team. Some states include an additional, alternate interviewer and so have a four-person block team.

A district official is expected to oversee project implementation in all the district’s blocks. Death reports and completed MAPEDIR interviews are compiled and analysed at the district level with technical assistance from UNICEF. Computer software developed by a private company is being used to facilitate data entry and analysis. Subsequently, UNICEF shares the findings from the interviews with district and block officials. NGO partners share the findings with communities in a way that facilitates their participation in the development of effective, evidence-based local health interventions. The ultimate goal of MAPEDIR is to reduce maternal deaths, through communities themselves taking remedial measures to address gaps at the local level, and officials taking corrective measures in the health system.

**THE PROCESS**

The community-based MAPEDIR process includes:

- **Involving the community through grassroots structures** i.e. Panchayati Raj Institutions (PRI)⁹, village health committees and self-help groups and sensitising them to maternal and perinatal health issues.

- **Identifying maternal and perinatal deaths** through local reports of ANMs, Anganwadi workers, ASHAs and other community members.

- **Conducting the maternal death inquiries** by interviewing family members who are most knowledgeable of the circumstances of the illness leading to the maternal or perinatal death.

- **Analysing and interpreting the findings** of the inquiries.

- **Sharing the findings with the community** in such a way as to promote the development of effective local interventions and advocacy by and with the community for improved services.

- **Sharing of data with the administration** for prompt action and strengthening health systems.

The flow chart on page 26 gives an idea of how the MAPEDIR process unfolds.

**MAKING OF A MAPEDIR INTERVIEWER**

Successful execution of MAPEDIR largely depends on the quality of training. Training for MAPEDIR interviewers spans three days and is typically facilitated by district dignitaries such as the Chief District Medical Officer (CDMO), the UNICEF district consultant/extender, and state-level resource persons. Technical sessions on the first day usually include the following topics:

- Introduction to MAPEDIR.

- Introduction to the state of maternal mortality in India, causes of maternal deaths, and the types of delays that usually contributed to such deaths.

- Local perceptions and practices that cause maternal deaths.

- Birth preparedness and complication readiness – JSY and ASHA links.

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⁹ PRIs are units of self-government proclaimed as vehicles of socioeconomic transformation in rural India, initially advocated by Mahatma Gandhi. Under a three-tier system of democratic decentralisation, *Zilla Parishad* is the apex body at the district level, followed by *Panchayat Samitis* at Block level as second-tier and *Gram Panchayats*, the third-tier at the village level.
MAPEDIR Implementation

- Introduction to verbal autopsy techniques, including the importance of the consent form.

After the introductory sessions, participants are taken through modules aimed at familiarising them with the data collection instruments such as: (i) Existing structures of maternal death notification and the desirable process, (ii) Maternal Death notification format, and (iii) All Women’s Death Registration Format. This is followed by reading through the Maternal Death Inquiry (MDI) format (see Box 6) and “practice sessions”. Participants break up into small groups and practice handling the data collection instruments they had learnt about.

On the second day, participants continue being familiarised with the MDI format and get more practice conducting maternal death inquiries through role-plays. On the final day, participants revise what they had learnt the previous day and get more practice in administering the full questionnaire. The final session aims at sensitising

“I work in the area of public health and am familiar with the basic medical issues. But the training in MAPEDIR taught me how to get information under difficult circumstances – ways to ‘introduce’ myself when I step into a household where a death has taken place. Earlier, one was a little hesitant. But the ‘role plays’ during the training session taught us simple techniques which can be used to allay the fears of a family where a maternal death has taken place. I learnt how to win the confidence of a grieving family. One can win the confidence of a family by simply telling them that even if they cannot undo the damage done, they will be helping prevent further damage by participating in the interview...”

Tanuka Banerjee
Public Health Nurse, Joypur block PHC, Purulia District, who conducted several maternal death interviews until June 2007
Box 6: Format of the maternal death inquiry questionnaire

The verbal autopsy questionnaire is divided into 10 sections which probe different aspects of the deceased woman’s life and circumstances leading to her death.

These areas include: Information about the woman and her family i.e., years of schooling, occupation of husband, type of house of the family, access to electricity, whether belonging to BPL, caste and religion of the family, etc. The medical aspects on which information is sought include:

- History of illnesses before the pregnancy
- Pregnancy history
- Details of antenatal care
- Details of the events and obstetric complications that possibly led to death
- Level of birth preparedness and outcome of the baby (in cases of death during or after delivery)
- Care seeking and barriers to care-seeking for obstetrical complications that led to the woman’s death.

Besides specific questions, there is also an “Open History” section which encourages respondents to describe in their own words “everything” that s/he knew about the illness/problem the woman suffered during her pregnancy, delivery or afterwards leading to her death and anything else which may be related. This captures valuable information which might otherwise have been missed during the interview.

Inquiries about the maternal deaths that occur in a community are conducted over a period of several months in order to accurately identify common factors that can be acted upon to prevent further deaths. Ongoing inquiries carried out over several years allow a community to monitor the impact of its preventive actions and the need for additional interventions.

The approach to and impact of training (see Box 7) has a lasting influence on how the trainees conduct the investigative tasks assigned to them and the reliability of the information they gather and are able to process. The sensitivity required of the interviewer as well as of the line of questioning in a matter as tragic as death makes it imperative that the investigator proceeds with utmost delicacy and respect for the bereaved family’s privacy as well as for the dignity of the dead. In ensuring this, the MAPEDIR training activity seems to have succeeded as seen from the response of a trained worker.

MAPEDIR GUIDELINES

How to Select the Best Respondent

The respondent/s is the key to the quality of information recorded about the deceased. S/he should be the one who was with the woman during her illness. Usually, the woman’s husband, mother, sister, mother-in-law, or sister-in-law is the preferred respondent for a maternal death. In some cases, more than one person will have taken care of the woman or been present during different stages of the illness. For example, the woman’s mother-in-law may have been present during
women's self-help groups (SHGs) can play a very important role in taking the process forward. For example, in villages where they are active, they can start little thrift societies with revolving funds. When a woman requires instant cash to go to the hospital for emergency care, she should be able to tap into the SHG’s emergency funds. Sometimes money is needed immediately. If communities do not want to lose their mothers’ lives, they would have to work out mechanisms to deal with these details as well.

Dr Khynn Win Win Soe
Maternal Health Officer, UNICEF

the birth at home, while the woman’s husband may have accompanied her to the hospital after the birth. All respondents must be at least 18 years of age.

The Ethical Dimension
MAPEDIR interviewers and supervisors are briefed rigorously about the ethical aspects of conducting research interviews such as informed consent and confidentiality. It is critical that all information obtained from the MAPEDIR interviews remains strictly confidential.

Confidentiality
It is critical that all information obtained from the MAPEDIR interviews remains strictly confidential.

“Women’s self-help groups (SHGs) can play a very important role in taking the process forward. For example, in villages where they are active, they can start little thrift societies with revolving funds. When a woman requires instant cash to go to the hospital for emergency care, she should be able to tap into the SHG’s emergency funds. Sometimes money is needed immediately. If communities do not want to lose their mothers’ lives, they would have to work out mechanisms to deal with these details as well.”

Dr Khynn Win Win Soe
Maternal Health Officer, UNICEF

Informed Consent
All potential respondents have the right to determine for themselves whether or not they will participate in the interview. Respondents must be 18 years old to help ensure they are capable of making this decision. Respondents must fully understand the purpose and expected duration of the interview, the risks and benefits of being interviewed, and their right to not answer any or all questions.

Box 7: Training participants to use the inquiry questionnaire

“I was convinced about the group-work approach in the training programme. On the first day, the participants expressed doubts about whether they would be able to deal with so many questions. On the face of it, their task appeared difficult, because the interviewers were expected to arrive at a family where a woman had died, ask many questions, and not offer any compensation. But actually on the second day of training, when they went through the formats, the participants realised that all the questions were not to be asked each time or in every case. For example, if the suspected cause of death was a particular one, then only that set of questions needed to be asked as was applicable to the cause. Through the process of elimination, the trainees soon learnt that all the questions were not relevant to each case. Therefore in an actual interview, s/he would use only one of the formats – not all, and not all questions.

It was heartening to note that by the third day, participants in almost every training batch were convinced about their ability to deal with the questionnaire. The training took place at Bolangir for about eight months. It was completed in December 2006.”

Dr Suresh Chandra Mishra
Deputy Director, State Drug Management Unit, Government of Orissa, previously the Nodal officer for the Navajyoti scheme and closely associated with the MAPEDIR process
confidential. Maintaining confidentiality is an ethical responsibility that is shared with all. It is necessary to protect the respondents from any repercussions that might occur as a result of the information they have provided.

Falsification of Data
The whole purpose of the MAPEDIR project is to collect, analyse, and share information with the community that can be used to prevent maternal deaths. This will be possible only if the information collected is authentic.

Sharing MAPEDIR Data with the Community Groups
Many parts of India where MAPEDIR is being implemented have the advantage of community structures such as self-help groups, which came into existence more than two decades ago. Their primary purpose was to make impoverished rural women economically self-reliant. However, today, these groups are engaged in many other areas affecting social development. Their leaders, often functioning as catalysts and mobilising agents, are also updated with MAPEDIR data.
Purulia district in West Bengal has become a laboratory for testing and shaping possible futures in India, pointing the way forward for other socio-economically underprivileged districts in the country. Despite its grinding poverty, the political will to shape another image of the district is distinctly present. The district administration, with support from UNICEF and other partners, is implementing strategies to boost neonatal and maternal survival such as IMNCI (Integrated Management of Neonatal and Childhood Illnesses) and MAPEDIR.

MAPEDIR’S INITIATION IN PURULIA

Purulia was the first testing ground for MAPEDIR. Though maternal death inquiries started as a regular process in Purulia from June 2005, the preparatory work started a year earlier. This entailed developing MAPEDIR as a tool and piloting the instrument. The MAPEDIR process commenced with a workshop aimed at sensitising the state and district administrations. NGO partners helped mobilise communities, Panchayati Raj institutions, village health communities, self-help groups and village councils.

In January 2005, the MAPEDIR tool, a structured verbal autopsy questionnaire was developed. The questionnaire was subsequently translated into Bengali, adapted to suit local conditions – factoring in cultural and linguistic specificities – and field tested. A series of TOTs (Training of Trainers) and training sessions for interviewers were conducted in the MAPEDIR districts. Interviewers were selected from among ANMs, ANM supervisors/ Lady Health Visitors (LHV), ICDS supervisors, and NGO members.

PHASED IMPLEMENTATION

To ensure best results, MAPEDIR was launched in a phased manner. Purulia district consists of 20 blocks. The 10 blocks located in the western part of the district are more disadvantaged than the rest, with female literacy rate below 30 per cent. These 10 blocks (Arsha, Bagmundi, Balarampur, Barabazar, Bundwan, Jhalsa I and II, Joypur, Manbazar I and II) were chosen for intense community and institutional mobilisation in the first phase.

Actually, sensitisation is a gradual process that takes several meetings in remote villages with low levels of literacy and awareness. The entry point is often a video film about maternal health (made with support from UNICEF) that is screened at the village. The interactions with the rural communities begin with general discussions about safe motherhood and proceed to issues critical to maternal death (see Box 8).
A COLLABORATIVE VENTURE: AN INTERFACE WITH THE COMMUNITY AND CIVIL SOCIETY

Getting MAPEDIR off the ground in Purulia demonstrates the value of partnerships between the Government and civil society networks to carry out a public health intervention. The MAPEDIR project’s execution here consisted of a collaborative effort of the Government of West Bengal, the Purulia district health administration, the RG Kar Medical College in Kolkata, local NGOs such as KALYAN (involved in generating awareness about safe motherhood among communities), UNICEF health teams and field operatives, and the Johns Hopkins Bloomberg School of Public Health, USA, which

Box 8: Connecting the unconnected

Gurpana is one among the 125,000 villages in the country without electricity. A remote village in the tribal-dominated Bundwan block of Purulia, it is also without a telephone service. The block Primary Health Centre (PHC) is 30 km away. Six months ago, there was not even a tarred road linking Gurpana to any health facility. During an emergency, villagers would request the staff in the local police post for the use of their jeep. From time to time, sporadic bursts of extremist violence in surrounding areas shatter the calm of Gurpana. Steeped in acute poverty, amidst all its hardships and limitations, Purulia is poised to undergo a change that has significant potential to save maternal and child lives.

A newly constructed warehouse in the village is doubling up as a community centre. On a hot, summer afternoon, pregnant women, young mothers carrying small children, grandmothers and a few fathers have gathered to watch a video film on maternal mortality on a battery-operated television. Many in the crowd cannot read or write but are mesmerised by the film, which talks about events that happen around them, places they have heard of, and situations they can identify with. The show is preceded and followed by a discussion initiated by field workers from KALYAN, a local NGO partnering with the district administration and UNICEF. The focus here is to sensitise communities, that are often un-reached by the regular healthcare system, about safe motherhood and newborn care.

“This is a village that has almost fallen off the map. Here, women do not know about new government schemes or the benefits they are entitled to... During our interactions, we stress the importance of institutional delivery,” says Sanjib Saha, UNICEF field operative in Purulia. "We make them aware of the warning signals for women who may be at high risk during pregnancy and delivery and the guidelines for referral transport to which they are entitled under the National Rural Health Mission.” Alongside, an NGO representative draws the attention of the crowd to the critical role of “three delays” in maternal deaths and the necessary measures to avert them.

Gurpana is not an isolated instance. Today, such awareness drives are being conducted at mothers’ meetings, community events, and other special occasions as part of the MAPEDIR process in 20 blocks in the district. “With greater awareness, we hope they would heed the danger signals and also work out community mechanisms to rush a woman in an obstetric emergency to the hospital,” adds Saha on a strong optimistic note.
gave technical support in developing the verbal autopsy questionnaire.

The Purulia district administration and UNICEF teamed up with KALYAN to disseminate key messages among Gram Panchayat leaders and members of women’s self-help groups. During these meetings, data on maternal deaths and the MMR in the country and state were disseminated. The interface with the community had to be tackled differently. Booklets and cloth posters in the local language were used to instil awareness about danger signs during pregnancy and childbirth.

The sensitisation of the community led to some unusual helpful initiatives. A typical example of this comes from the Bundwan block. As there is hardly any local means of transport, and ambulances cannot reach beyond a certain point, one of the local Gram Pradhans (Village Heads) took the lead to provide a local means of transport – a van rickshaw – to a self-help group so that they could use it to connect to the nearest point from where an ambulance can pick up the patient. The Block Development Officer of Bundwan was very enthused by these developments and is planning to put the telecom network in place to bridge the gap further.

The community-based social audit of maternal deaths in Purulia revealed that rural medical practitioners (RMPs) play a critical role during pregnancies and home deliveries in villages. To exclude them from a public health intervention could be counterproductive. Accordingly concerted efforts were made to engage them, invite them to workshops, inform them about key issues in maternal health, and update their knowledge about why, when and where maternal deaths were taking place. Such orientations were held for RMPs in all 20 blocks in Purulia with the aim of changing their often incorrect practices.

### MAPEDIR’S FINDINGS AND ACHIEVEMENTS

At the time of printing the current report, the second year of comprehensive data collection using MAPEDIR was completed by Purulia district authorities (2007-2008)

Up to early June 2007, 191 maternal deaths had been reviewed. An analysis of the first 60 deaths has been shared with the community and district/state health officials. The second set of data comes from a review of 102 maternal deaths that occurred in Purulia from July 2005 through June 2006. From the review data it was noted that more deaths are reported in certain months of the year (see Table 2). However, as the data pertains to only one year, it is difficult to infer any specific pattern or trend. Further, the maternal deaths reported from the less developed blocks ranged between 1 to 10 deaths during the period reviewed, thereby indicating that notification of maternal deaths is directly related to accessibility.

The maternal death reviews conducted under MAPEDIR yielded valuable information on critical factors that influence a pregnant woman’s health.

<table>
<thead>
<tr>
<th>Table 2: Maternal Deaths by Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month</td>
</tr>
<tr>
<td>July 2005</td>
</tr>
<tr>
<td>August</td>
</tr>
<tr>
<td>September</td>
</tr>
<tr>
<td>October</td>
</tr>
<tr>
<td>November</td>
</tr>
<tr>
<td>December</td>
</tr>
<tr>
<td>January 2006</td>
</tr>
<tr>
<td>February</td>
</tr>
<tr>
<td>March</td>
</tr>
<tr>
<td>April</td>
</tr>
<tr>
<td>May</td>
</tr>
<tr>
<td>June</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
and survival. Several of the instructive findings are highlighted.

**FINDINGS OF MAPEDIR**

1. **Timing of Maternal Deaths**
The MAPEDIR data reveals that most of the maternal deaths (67 per cent) occurred during labour or delivery out of which 13.4 per cent occurred before delivery and during labour, 13.4 per cent before delivery of placenta, 27 per cent within less than 24 hours delivery, and 46 per cent within or more than 24 hours after delivery. About 21 per cent women died during pregnancy. A total of 13 deaths occurred during / after abortion of which five were found to be spontaneous and seven were induced (see Figure 1).

2. **Neonatal Deaths**
Among 68 women who died during labour and delivery, 13 per cent (n = 9) experienced intrauterine foetal death (IUFD); 16 per cent (n = 11) children were stillborn; 22 per cent (n = 15) were born alive and died; and 48.5 per cent (n = 33) were still alive at the time of the interview. Evidence indicates that the care during and after delivery remains the most crucial time for both maternal and neonatal survival.

3. **Place of Death**
About 62 per cent (n = 62) of the maternal deaths occurred at health facilities. This could be due to the fact that many sought care too late, increasing the severity of illness and chances of dying on reaching a facility. About 23 per cent (n = 24) occurred at home, while the rest 16 per cent (n = 16) occurred either en-route from home to a health facility or from one facility to another (from first to second facility and from second to third facility (see Figure 2).

4. **Pathway Analysis**
Of the 102 maternal deaths, 17 women died at home – either not making any attempt to seek formal care or, even if they decided to seek care, they died before leaving home. Among the 85 mothers who left home to seek care, 75 reached the first facility and 10 died on the way. Of the 75 who reached the first facility, 32 died at that facility and remaining 43 were referred to the next level. From the latter group, 5 returned and died at home. Of the 38 mothers who set out to access the second referral facility, 4 died en route, 27 died at the second facility, and 7 were referred to the next facility. Of those 7, 2 died on the way to the third facility, 2 returned home and died, and 3 who reached the third facility died there (see Figure 3).

5. **Causes of Death**
Fifty three per cent of maternal deaths were due to direct obstetric causes, 13 per cent from abortion, 17 per cent haemorrhage, 19 per cent eclampsia, and 4 per cent other diseases. 21 per cent were
due to indirect causes, with severe anaemia accounting for nearly half of these deaths. The verbal autopsy interview could not determine the biological diagnosis in 26 per cent of the deaths (see Figure 4).

6. Demographic Profile of the Deceased
At the time of death, the age of the mothers ranged from 15 to 35 years, with the majority dying at 24 years. Early marriage and early child-bearing below the age of 18, when most obstetric complications tend to occur, may have been major contributors to these deaths. The age at marriage ranged from 11 to 24 years but most of the women who died were 17 years old at the time of marriage. More than a third (35 per cent) of women died at their first pregnancy, 53 per cent were between second and fourth pregnancies, and the remaining 12 per cent were at the fifth pregnancy or more. These statistics confirm that early marriage, too many pregnancies, and too close birth intervals pose major risks to the survival of pregnant women, and account for a large proportion of maternal deaths.

7. Socioeconomic Profile of the Deceased
Predictably, most of the deaths occurred in the poor families with minimal facilities. 81.4 per cent (n=83) women lived in *kutcha* houses, 99 per cent (n=100) did not have their own toilet, and 87.3 per...
8. Decision-making Power and Reasons for Seeking Care

The role of the deceased women in seeking care was inconspicuous. Cumulatively, in a majority of cases (35 per cent for first facility and 33 per cent for second facility), the deceased’s husband played the key role in deciding to seek care. The woman had little or no role in the decision-making process. The most common factor in choosing a health facility for seeking care was its proximity either from their home to the facility or from one facility to another. The quality of care expected was the next determinant in seeking care. Generally, once a complication endangering the health and survival of the pregnant woman arose, the husband played a major role in deciding when and from where to seek care. This appropriation of decision-making authority by the male is attributable to socioeconomic and cultural factors prevalent in rural India, limiting women’s choices and decision-making powers (see Box 9).

9. Decision-maker for Seeking Formal Care

For seeking formal care, the husband and ‘others’ accounted for 95 per cent cases (see Table 3).

Although the woman herself was rarely a decision-maker, disaggregated data suggests that when women decided earlier, formal care-seeking increased. The woman was one of the decision makers only 9 per cent of the time in seeking formal care first, and less than 2 per cent of the time when she never did seek formal care first. For the first action decision makers, the woman’s husband was the most frequent individual decision maker. Very rarely was the woman herself one of the decision makers for going from the first to the second facility. This may be due to the woman’s serious condition decreasing her ability to make decisions.

10. Mode of Referral Transport

The most commonly used transport for reaching all facilities was a taxi. This was used by 47 women for travelling from the home to the facility, by 18 from first to the second facility, and by 2 from
second to the third facility. Ambulance services were used by only 30 of the deceased mothers. Of them, 7 used ambulance to move from home to the facility, 21 from first to the second facility, and 2 from second to the third facility. Eleven mothers were found to have been transferred to the facility from home by rickshaw or by cart, three by bus, and incredibly one woman even walked to seek care for the complication to which she later succumbed.

In any medical emergency, having to rely on slow moving transportation even across small distances can be costly to human life. Improved mobility can make a major difference to timely access to critical care. Strategies to overcome the mobility barriers need to be based on local conditions. Families, especially husbands, generally have the primary responsibility for deciding on the mode of transportation. Attempts should be made by the NGOs to sensitise husbands and other family members on the criticality of timely care-seeking as well as to mobilise communities for sensitising local operators and vehicle owners to help women with obstetric complications. Communities or local self governments could establish a fund to reimburse individual drivers and vehicle owners for fuel when they transport obstetric emergencies.

### Table 3. Who decides to seek formal care?

<table>
<thead>
<tr>
<th>Decision maker*</th>
<th>Woman never sought formal care (17/102)</th>
<th>Woman sought formal care, but not first (38/102)</th>
<th>Woman sought formal care first (47/102)</th>
<th>Total (of all decision makers for 102 women)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Self</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Husband</td>
<td>8</td>
<td>33</td>
<td>27</td>
<td>41</td>
</tr>
<tr>
<td>Others</td>
<td>16</td>
<td>67</td>
<td>37</td>
<td>57</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>24</td>
<td>100</td>
<td>65</td>
<td>100</td>
</tr>
</tbody>
</table>

*Multiple responses

in 29 per cent of deaths, the families did not consider that the woman was sick enough. In 13 per cent of cases, the family thought that non-formal or traditional care was needed to treat the problem, and about 6 per cent did not have any faith in formal care. Other reasons were non-availability of transport (19 per cent), and financial constraints in paying for the transportation and healthcare costs (23 per cent). About 6 per cent of mothers were not able to go to a facility to seek care as they did not have anyone available to accompany them to the facility (see Table 4).

Clearly, perception of the severity of illness and the choice of appropriate care-providers were the most common care-seeking constraints for women who never sought formal care, while cost of care and transportation issues were more important considerations for women who sought formal care first or later.

Very often, women and their families do not recognise the life-threatening signs of pregnancy-related complications as well as the seriousness of the condition, do not have faith that they can be managed through formal healthcare, and may not be able to arrange transport due to lack of money – resulting in delay in deciding to seek care at the right time. Overall, cultural, economic as well as infrastructural factors influence how
fast and if at all a woman’s illness will evoke formal care. Consequently, educational campaigns need to focus on all these issues. Further, extensive discussion with community members may be necessary to determine what action is acceptable and feasible to promote in the context of the community and the structure of health service.

12. Time and Cost Aspects
As seen in Table 5, the time taken to decide to seek care and arrange for transport from home to the facility was around 4-5 hours for most mothers. Yet, any woman having post partum haemorrhage would survive only for a maximum of two hours. At the referral level, in both first and second referral facilities, most cases were attended within 5 minutes of arrival. The cost of care provided at the second facility was higher compared to that incurred at the first facility.

Most of the families spent around Rs 500 (Rs 41 = 1 USD) at the first facility and almost all the families spent more than Rs 1,400 at the second facility, some considerably more than others. While the cost difference is most probably due to the varying care provided at different facilities, at all levels, the cost of care would be a major inhibitor to seeking care. The frustrating feeling that even after the expense undertaken, lives were not saved would be a strong factor dissuading many from seeking future care.

Considering the poor socioeconomic status of the families where a majority of maternal deaths occur, strengthening the implementation and coverage of different poverty alleviating programmes becomes imperative to making healthcare and access more affordable.

13. Need for Obstetric Emergency Care Preparedness
When poor rural families decide to seek care at a formal healthcare facility, they often go to the nearest Block PHC or Health Centre (BPHC/HC) where emergency obstetric care is not available. From there they are then referred to another health facility. This increases the distance, cost, as well as time – all of which are very precious to save a pregnant woman’s life. Therefore, it is essential that pregnant women and their families as well as various tiers of the health service infrastructure – from the apex to the

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Table 4: Problems related to seeking care and reasons thereof

<table>
<thead>
<tr>
<th>Care-seeking problems</th>
<th>Never sought formal care</th>
<th>Sought formal care but not first*</th>
<th>Sought formal care first*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td><strong>Perception and cultural issues</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not sick enough</td>
<td>8</td>
<td>53</td>
<td>67</td>
</tr>
<tr>
<td>Needed traditional care</td>
<td>2</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Too sick to travel</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Cost and transport</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost (transport, care, etc.)</td>
<td>2</td>
<td>13</td>
<td>33</td>
</tr>
<tr>
<td>Transport not available</td>
<td>3</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td><strong>Other reasons</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No one to accompany her</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not satisfied with available care</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Number of reasons given</strong></td>
<td>15</td>
<td>100</td>
<td>37</td>
</tr>
<tr>
<td><strong>Number of women</strong></td>
<td>13</td>
<td>21</td>
<td>7</td>
</tr>
</tbody>
</table>

*First action taken
peripheral – be prepared for and educated to tackle birthing-related emergencies that can occur at any time. Being prepared for a safe delivery and ready for an obstetric emergency will reduce these life-threatening delays and save the lives of both mother and baby.

**Table 5: Time and cost for all women who sought formal care (n = 85)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance travelled from home to 1st facility</td>
<td>27 km</td>
<td>1-197 km</td>
</tr>
<tr>
<td>Time of travel from home to 1st facility</td>
<td>1 hour</td>
<td>0-5.8 hours</td>
</tr>
<tr>
<td>Cost of transportation</td>
<td>Rs 450</td>
<td>Rs 0-4,600</td>
</tr>
<tr>
<td>Cost of care</td>
<td>Rs 800</td>
<td>Rs 0-28,000</td>
</tr>
<tr>
<td>Seen by doctor or nurse, within</td>
<td>5 minutes</td>
<td>0-7 hours</td>
</tr>
<tr>
<td>For 43 women who left the 1st/2nd facility alive, time at facility</td>
<td>24.5 hours</td>
<td>0-168 hours (7 days)</td>
</tr>
</tbody>
</table>

**Time and cost of seeking care for women who reached 1st facility (n = 75)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time taken to decide to seek care</td>
<td>4 hours</td>
<td>0-9 days</td>
</tr>
<tr>
<td>Time taken to arrange transport</td>
<td>1 hour</td>
<td>0-12 hours</td>
</tr>
<tr>
<td>Distance travelled from home to 1st facility</td>
<td>12 km</td>
<td>0-60 km</td>
</tr>
<tr>
<td>Time of travel from home to 1st facility</td>
<td>30 minutes</td>
<td>0-4.2 hours</td>
</tr>
<tr>
<td>Cost of transportation</td>
<td>Rs 300</td>
<td>Rs 0-1,100</td>
</tr>
<tr>
<td>Cost of care</td>
<td>Rs 500</td>
<td>Rs 0-6,000</td>
</tr>
<tr>
<td>Seen by doctor or nurse, within</td>
<td>5 minutes</td>
<td>0-60 minutes</td>
</tr>
<tr>
<td>For 43 women who left the 1st facility alive, time at facility</td>
<td>24 hours</td>
<td>0-196 hours (8.2 days)</td>
</tr>
</tbody>
</table>

**Time and cost of seeking care for women who reached 2nd facility (n = 34)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance travelled from 1st to 2nd facility</td>
<td>32 km</td>
<td>11-100 km</td>
</tr>
<tr>
<td>Time of travel 1st to 2nd facility</td>
<td>1 hour</td>
<td>0-3.5 hours</td>
</tr>
<tr>
<td>Cost of transportation</td>
<td>Rs 400</td>
<td>Rs 0-1,500</td>
</tr>
<tr>
<td>Cost of care</td>
<td>Rs 1,400</td>
<td>Rs 0-25,000</td>
</tr>
<tr>
<td>Seen by doctor or nurse, within</td>
<td>5 minutes</td>
<td>0-7 hours</td>
</tr>
<tr>
<td>For 7 women who left the 2nd facility alive, time at facility</td>
<td>12 hours</td>
<td>2-72 hours (3 days)</td>
</tr>
</tbody>
</table>

ACHIEVEMENTS OF MAPEDIR

Beyond fact-finding that has yielded a wealth of information bearing on future actions to prevent maternal mortality, the MAPEDIR experiment in Purulia has several achievements to its credit:
Key findings from MAPEDIR data:

- Most maternal deaths take place in the post-partum period with majority taking place on the first post-partum day.
- Bleeding is the most common cause of death followed by eclampsia.
- Most women who died belonged to Scheduled Caste/Tribe and were illiterate.
- Family members of most women who died were not aware of Below Poverty Line (BPL) entitlement regarding medical care.
- Women have very little role in deciding to seek healthcare.

1. Demystifying Maternal Health

The main merit of MAPEDIR is that it seeks to demystify maternal health and bring the household and community closer to the healthcare system. In that way, it is much more than an investigative tool or a fact-finding process. Although at the start of MAPEDIR, considerable effort went into developing the questionnaire – field-tested for the first time in Purulia – the emphasis should not be on the questionnaire per se. As Dr Henry Kalter of Johns Hopkins points out, “The questionnaire is a tool to facilitate a process. MAPEDIR is a process of raising awareness: getting people concerned and involved with maternal and child health issues, as well as more knowledgeable and empowered to do something about it... It is intended to help people overcome the powerlessness that comes from the feeling that you cannot do anything to change outcomes...”

Others involved in the project echo the above perception. Frontline workers stress that working towards safe motherhood is a gradual process in a district like Purulia. “First, one has to create the conditions in which maternal death reviews can be carried out. This means explaining basic issues concerning maternal health to mothers’ groups, even health workers, without using any jargon or technical phrases,” says Mehrunnisa, KALYAN’s block supervisor for Jhalda I and II blocks in Purulia district.

Over the past two years, KALYAN’s field workers have been speaking about MAPEDIR in village level gatherings, explaining the significance of the findings and alerting mothers and community workers about the ‘danger signs’ based on insights from MAPEDIR reviews. Typically, homely analogies are used to illustrate a key concern. At mothers’ meetings where a significant number among the audience are illiterate and were married off very early, Mehrunissa uses the analogy of a ‘half-baked clay pot’. Such a pot can break easily. Similarly, if a woman conceives at a very early age, she is exposing herself to risk during pregnancy. Although this may sound like common sense, much of the information imparted by outreach workers like Mehrunissa is a revelation to the women in the audience.

Because participation in such meetings is empowering both for the healthcare giver and seeker, in itself it becomes a healthcare
intervention. Experience of such reviews with the community has shown a major impact on those involved. Often, those participating in the reviews are motivated to change their behaviour, practices or service delivery methods. Tracing a deceased mother’s path through the community and healthcare system, and describing the actions that might have prevented her death, have a meaningful personal effect.

2. Native Ambulance, a Ripple Effect
The first tentative steps towards a sustainable, community-based transport system for obstetric emergencies have been taken in one of the most backward regions in India – thanks to MAPEDIR!

Rugged terrain, unpaved roads, lack of transport and communication are some of the key barriers between pregnant women in remote villages in Purulia and their access to quality healthcare. Happily, an innovative community-led transport system for obstetric emergencies has emerged as a legacy of the MAPEDIR process.

In an analysis of the first 60 maternal death interviews that was shared with the community, relatives of 19 per cent of the women who delayed or never sought formal healthcare, cited non-availability of transport as a serious obstacle; while another 29 per cent mentioned lack of money for transport. These findings acted as a wake-up call, alerting community leaders, families and local officials to the causes and circumstances leading to the deaths of women whose lives could have been saved if elementary precautions and measures had been taken. The situations were familiar but prior to the launch of MAPEDIR, not much thought had been given to tracing the linkage between deaths and the delays causing them.

Over the past two years, against the backdrop of new government schemes offering incentives for institutional deliveries, MAPEDIR data was shared with communities at village meetings, gatherings of gram panchayat members and women’s groups etc. Several gram pradhans in Purulia were prompted to come up with mechanisms to address one of the weakest links in the chain of circumstances causing a maternal death: lack of transport to take a pregnant woman to the nearest appropriate health facility.

Shankar Prasad Singh, a village school teacher and gram pradhan of Dhadka gram panchayat in Bundwan block in Purulia, was perhaps the first village-level leader in the area to realise the ‘political’ value of organising local transport for pregnant women in his constituency. Singh was quick to translate the idea into action. “I realised I could tap into the untied funds available to the gram panchayat (village council) to buy these

“We always thought ‘development’ meant building roads. But it does not end there. Now we realise that it also means making sure there is transport and that people have access to healthcare and education. On the last Saturday of every month, each panchayat or village council holds a meeting to discuss health-related issues. Since last year, these meetings have devoted a lot of time to maternal and child deaths. These interactions have made me realise that a key issue in saving mothers is getting them safely to a health centre or hospital for delivery. If we can achieve this, we can prevent many maternal deaths. As I talked about this with others, the idea of a van rickshaw emerged…”

Shankar Prasad Singh
High school teacher and Gram Pradhan of Dhadka village council, Bundwan block, Purulia
rickshaws. I got two such van rickshaws at a cost of a little over Rs 12,000. They were made by local people...,” he adds.

Similar efforts are underway in other villages, with communities evincing a new resolve among them to tackle the barriers to timely care for pregnant women at risk. Earlier this year, a locally manufactured van rickshaw was placed with one of the self-help groups in Badakhula, a remote village, so that pregnant mothers could use it to reach a health facility for delivery. Badakhula is located in forested area. The approach road to the village is a mud track; the nearest health sub-centre is 5 km away. There is no phone in the village. A bicycle is the common mode of transport.

Pregnant women were carried in a duliya, a string cot, till the nearest point from where a jeep could be hired to take them to the Bundwan block PHC. In extreme circumstances, they even walked. A new community level transport for obstetric emergencies – the van rickshaw – is now expected to step up institutional deliveries, encouraged by the government’s Janani Suraksha Yojana.

This has had a ripple effect. In June 2007, the Gram Pradhan of Kumari Gram Panchayat of Manbazar II block in Purulia handed over two van rickshaws to two local self-help groups in the least developed villages where there are almost no transport facilities and about 75 per cent of deliveries take place at home.

An operational guideline has been prepared and the communities have decided that the van rickshaws will go directly to the health facility as no mode of communication is available in these villages. These van rickshaws, which will be used for transport of non-obstetric emergencies as well, are also being linked to the local microfinance system through the SHGs.

3. Stimulating State Action
MAPEDIR has spurred not only communities, but also state and district levels of the government to concrete action. Following the launch of MAPEDIR, the Government of West Bengal has passed an order to review every maternal death, toning up the entire maternal death reporting system. Along with community-based reviews, facility-based reviews of maternal deaths have also been initiated, to address the third level of delay (calling for prompt attention and improvement of the quality of care to pregnant women at health facilities).

4. Strengthening the System
MAPEDIR has speeded up ongoing efforts to improve the health infrastructure. For example, all maternity beds in public sector facilities in West Bengal have been made ‘free’ for all; the GOWB is working on a cashless (voucher-based) referral transport system (in addition to the community initiatives that have already been put in place by various gram pradhans). The MAPEDIR process has made health service providers more aware of systemic gaps.

FORWARD MARCH

The next steps in Purulia include spurring village leaders to establish a local emergency transport system to initially link up the 10 least developed blocks in Purulia. The remaining 10 blocks will also be targeted for similar interventions. Perinatal death reviews and facility-based reviews of maternal deaths are also on the cards. KALYAN, the NGO partner that has been working in the district since 2005, has formulated an action plan for intensifying efforts for generating community awareness on safe motherhood and newborn care in all blocks of Purulia district in the near future.
Challenges Ahead
The key challenge in Purulia is effective and regular supervision of the process. Many block medical officers who are entrusted with supervisory responsibilities still think routine rather than results. In practice, this leads to neglect and oversight when a filled questionnaire is signed off, without a thorough scrutiny. Feedback from the field suggests that in some instances, the questionnaire was perceived as lengthy, and was submitted incomplete.

The socio-cultural context is another challenge. In villages steeped in superstition and illiteracy, where quacks and traditional birth attendants still configure the local practices and services, considerable additional effort is required to change the people’s mindsets. For instance, many families still follow the popular practice that a woman should not eat much when she is approaching her expected date of delivery.

THE PURULIA MODEL

» In June 2005, Purulia in West Bengal, one of the most disadvantaged and underprivileged districts in the country, was selected to become the testing ground of MAPEDIR in India.

» Preparatory work, started a year earlier, included sensitising and mobilising communities, Panchayati Raj institutions, village health communities, self-help groups and village councils, as also the state and district administrations.

» MAPEDIR’s structured verbal autopsy tool was suitably moulded to encompass local conditions and field-tested in 10 of the more disadvantaged blocks having no roads, electricity or telecommunication, and a female literacy rate below 30 per cent.

» A true-to-life video film featuring local situations concerning maternal deaths, supported by awareness generating booklets and posters in the local language, served as an inspiration to all-round concerted action.

» The example of a village Pradhan providing locally built van rickshaws for transporting obstetric emergencies was emulated by others – and even a Government official promised to work towards providing a telecom network.

» The success of the MAPEDIR mission in Purulia was the result of a collaborative effort of GOWB, the district health administration, RG Kar Medical College in Kolkata, local NGOs, UNICEF health teams and field operatives, and the Johns Hopkins Bloomberg School of Public Health, USA.

» MAPEDIR’s detailed findings on the causes of maternal deaths, demographic and socioeconomic profile of the deceased, their reasons for accessing or not accessing healthcare in time, etc., provided a repository of analytical data for immediate and future action at different levels.

» The achievements of MAPEDIR at Purulia included demystifying maternal health to the local population, stimulating the community and State into sustained action, and strengthening the healthcare system as a whole.

» The Purulia experiment of MAPEDIR has yielded a wealth of experience and information that will have a strong bearing on future strategies and actions to prevent maternal mortality in India.

» Inside stories of women from Madhya Pradesh, Orissa, and Rajasthan, though with a different geographical backdrop, essentially reflect the same helplessness and despair that go hand in hand with poverty, illiteracy and a non-supportive and exploitative environment.
“You can tell the condition of a Nation by looking at the status of its women.”

Jawahar Lal Nehru
India’s first Prime Minister
The snapshot from Muradpur village in Guna district, Madhya Pradesh in Box 10 below captures the poignancy of a maternal death in a remote, rural corner of India. It also holds lessons for policy makers and practitioners grappling with the challenge of averting such tragedies in this vast,

**Box 10: Behind the veil**

It is a journey down bumpy roads, through dusty, parched land dotted with mud huts and thatched roofs. All around are shades of brown. The only visual relief is from the vivid scarlet of the Flame-of-the-Forest tree. The landscape surrounding Muradpur village in Bamori block (Guna district) is reminiscent of so many arid patches across India where livelihoods are tenuous and where women are at high risk during pregnancy and childbirth.

In Muradpur, the arrival of the MAPEDIR interviewer is an event, breaking the culture of silence that engulfs the vast majority of women. Family members are surprised that anyone cares enough to ask so many questions about the deceased. Here, most women live behind the veil, unaware of and scarcely touched by the world outside the four walls of their homes. A health sub-centre almost at their doorstep does not translate into healthcare for them.

Tracking a maternal death in such a context is vital because it tells the untold stories of women whose lives and deaths go unheeded. The inquiry remains confidential. The name of the woman is not divulged, nor blame apportioned. At the end, many questions still remain unanswered. But the interview brings out unknown aspects of the dead woman’s life that traditionally would have found no place in official records.

A recent maternal death review in Muradpur traced the chain of events leading to the death of a woman who was seven months pregnant with her third child. The woman, in her twenties, had died in the district hospital, leaving behind two small children. A possible cause: eclampsia. Without validation from concerned medical authorities or medical records, it is difficult to specify the exact cause of death; but in this case, where and how the woman had lived tells us a great deal. The family subsisted on dairy farming. They were above the official poverty line but lived in a mud house. None in the family had gone to school; the women covered their faces behind a veil. A health centre was within walking distance, but the dead woman had never gone there. None in the family could recall whether she had ANC check-ups or how many. No one knew if she suffered from any illness and no one was aware of danger signs during pregnancy.

One early morning, at 6 am, the woman had complained of an acute back pain, her sister-in-law told the female health worker conducting the interview. The village ‘dai’ (untrained midwife) was summoned and the suffering woman was given some pills. Subsequently she was taken to a local practitioner (quack) as there were no medical personnel in the sub-centre at that hour. When things did not improve, the family elders had taken the decision to take the woman to the district hospital. Her husband, a farmer, had left for work. His brother and sister-in-law escorted the ailing woman to the district hospital. She had a seizure on the way to the hospital, was put on saline on arrival, and started vomiting blood after some hours, the sister-in-law recalled. The woman expired the next morning.
sprawling state with one of the lowest ratings in human development in the country. In Madhya Pradesh, 37 per cent of the population lives below the poverty line – significantly higher than the national average of 26 per cent. Poverty co-exists amid vast pools of illiteracy, in a socio-cultural milieu where women are accorded low status, under-age marriages continue, and the paucity of health services and trained medical personnel add to the risk of child bearing. Poor road connectivity in a geographically large state accentuates the difficulty in accessing healthcare.

All these factors make for a lethal mix which results in among the worst maternal and infant mortality ratios in the country. But all is not bleak. There is a growing realisation within the state and district administrations that things must change. MAPEDIR is creating the evidence base to speed up interventions that would strengthen the health system and empower communities to take the necessary steps to save mothers.

Strategies for Change
Making change possible for mothers in places like Muradpur is not easy. However, maps help to pinpoint as well as highlight the maternal mortality problem as seen in Box 11.

MAPEDIR is being implemented in Guna and Shivpuri. Both districts have the advantage of simultaneously serving as sites for another innovative initiative known as ‘Village Planning’, which seeks to integrate various developmental schemes that have a bearing on maternal and child health. It mobilises and empowers communities to take charge and steer the changes.

On the ground, the first step is notification of maternal deaths by the ANM, the anganwadi worker, ASHA (the local village-level link-worker) or any Panchayat member to the block. In Madhya Pradesh, deaths of all females in the 13–49 age group are reported and those suspected of being maternal deaths are investigated. During the training, interviewers are advised not to visit a family during the official mourning period. Therefore, interviewers typically visit the family three to five weeks after the maternal death has taken place. In most instances, it has been found that the family is comfortable talking about the death and does not mind being interviewed. However, in some cases, repeated visits have to be made to meet all the respondents.

Encouraging Results
The MAPEDIR process has led to the initiation of health audits in all Gram Panchayats (village councils) in Guna since January 2007. Such audits review five main issues i.e., maternal deaths, ANC registration and checkups, immunisation coverage, institutional deliveries, and cataract detection and operations in the panchayat limits. Other significant outcomes from the MAPEDIR process include: arrangement of 22 referral transport vehicles round the clock within the government system, and operationalising seven institutions to conduct deliveries. Nine more will be operational by the end of the year.

Health Audits by Panchayats in Guna

MAPEDIR’s Catalytic Effect
MAPEDIR’s catalytic effect is being felt in the changes sweeping the Fatehgarh sub-centre in Bamori block. Provided the initial impetus for
Box 11: Mapping maternal deaths to awaken the community and service providers

“We asked interviewers to put a red dot on the villages where maternal deaths were taking place in the district map of Guna. When they clustered the deaths, the picture became clearer. We found certain Primary Health Centres (PHCs) did not have a doctor and many sub-centres had unfilled posts of ANMs (Auxiliary Nurse Midwives). In many instances, vehicles were not available to transport the woman in labour to health institutions. In some sub-centres, ANMs were posted but did not possess adequate skills to conduct deliveries.

MAPEDIR was an eye opener. It started telling us where women were dying and the underlying reasons. For example, Bamori block which is close to the Rajasthan border was one of the places where pregnant women were at high risk because of its remoteness. There were no trained personnel to conduct deliveries. It was clear that by upgrading one of the sub-centres (Fatehgarh), posting additional personnel, and putting them through training on skilled birth attendance (SBA), we would be able to save many lives.

Moreover, maternal death mapping could be used to influence the district administration. When the Guna District Collector saw these maps and data, he was convinced of the need to equip all PHCs with vehicles which could be used to transport emergency obstetric cases to the referral facility.

“The above data triggered corrective actions. The Guna district administration conducted a survey on availability of vehicles in the district from all sources and negotiated cost-effective deals. Now, we have vehicles regularly available for transporting pregnant women to hospitals in the district.”

Dr Narayan Gaonkar
Health Officer, UNICEF Office for Madhya Pradesh

change, the local Gram Panchayat now has taken up the challenge of reducing maternal deaths. “We have worked out a mechanism for transporting pregnant women. The sub-centre gets phone calls from remote villages requesting for transport to bring a pregnant woman. It gets in touch with me; I contact the local vehicle owners and transport is dispatched immediately. Once we got a call from Digdoli village, 18 km away, in the middle of the night. We were able to send a jeep within 15 minutes of receiving the call and the expectant mother was brought to the Fatehgarh sub-centre in time,” says Mohan Baghel, Vice Chairman of the local Gram Panchayat.
The sub-centre is being upgraded to a sector Primary Health Centre (PHC) and the foundation laid for a regular labour room. All contracted staff at Fatehgarh has undergone training in skilled birth attendance at the Guna district hospital, and has started using a partograph, a tool used to assess the progress of labour and the need for intervention. The AYUSH dispensary, where postnatal women stay, now provides medicines to postnatal women to increase lactation and to prevent post partum haemorrhage. The community is glad that the Fatehgarh centre is now available 24 hours a day for deliveries: otherwise they would have had to go to Bamori or Guna, or as before, many would have been forced to have home deliveries assisted by traditional untrained birth attendants.

“"The Fatehgarh experiment has been a huge success. Once we have shown results, we can argue for more funds for vacancies to be filled up,” says Guna CMHO Dr Raghuvanshi. UNICEF had supported the additional staffing of Fatehgarh sub-centre for a year. Now for the year 2007-08, all the staffing cost is incorporated in the district health budget of RCH II, says Ms. Rohini Jinsewale, UNICEF Extender in Guna district.

**Improved Mobility**

Based on the success at Fatehgarh (see Box 12), a referral transport model was initiated for emergency referral transport vehicles to be placed in institutions conducting 24-hour deliveries in Guna district. With the support of NGOs, contact numbers of the drivers were made available to the community, enabling families to call on them when needed.

**Notable Findings of MAPEDIR in Madhya Pradesh**

1. **Demographic and Socioeconomic Indicators**

   In Guna and Shivpuri districts, 102 maternal deaths were identified and investigated from January 2006 to June 2007, and the data for 92 were analysed. The interview findings clearly showed that the women who died belonged to vulnerable groups. Half of them married at age 17 years or below, 67 per cent were illiterate, and 55 per cent were members of a scheduled caste or tribe, versus 32 per cent of the general population. Also, 62 per cent of the women’s families were BPL card holders, but only 24 per cent knew about the BPL referral transport benefit.

2. **Timing and Causes of Death and Access to Skilled Assistance**

   As much as 97 per cent of the 92 analysed maternal deaths occurred during labour and in the post partum period, with 30 per cent women dying more than 24 hours after delivery. Most deaths were due to causes directly related to the pregnancy, including 29 per cent from haemorrhage, 27 per cent eclampsia, 9 per cent septicaemia, and 8 per cent obstructed labour. Amongst indirect causes, 10 per cent died of anaemia and 12 per cent by other causes. Five per cent of the deaths were due to undetermined causes. 36 per cent of the deliveries took place at home, without the benefit of a skilled birth attendant.

3. **Decision Making in Respect to Accessing Formal Care**

   Nearly one-third (32 per cent) of the deceased women never sought formal healthcare for their illness, and another 10 per cent delayed formal care seeking by first taking another action. Not recognising the severity of the illness was the leading reason (68 per cent) for not seeking formal care first or at all. The woman’s husband (45 per cent) and others in the household (48 per cent), including her mother and in-laws, were the main persons to make this vital decision regarding care seeking. Only 8 per cent of the women themselves took part in decision-making. Among those who did seek formal care, half the families took 30 minutes or more to arrange for the woman’s transportation, and another hour or longer to travel to the first facility visited.
4. Referral Facilities

More than two-thirds (69 per cent) of the women seen at a formal health facility were referred to a higher level institution, mainly due to complications that were unmanageable at the first facility. The average out-of-pocket expenditure for transportation and treatment at the first facility was Rs 300 (0–1,500). Families spent on average Rs 500 (0–3,000) for transportation and treatment at the second facility. Most families had to borrow money for hiring a vehicle to go to a health centre, indicating a lack of resources and preparedness of the family for any eventuality associated with childbirth.

B. NUAPADA AND KORAPUT, ORISSA

Though rich in mineral wealth and natural beauty, Orissa is paradoxically among the poorest states in India. Acute poverty, widespread hidden hunger, and lack of basic services are severe obstacles to
Living and dying on the margins

It is sundown. In a dry, barren village in Khariar block in Orissa’s Nuapada district, a family is being interviewed about the death of a 30 year-old woman who expired after delivering her fourth child. Official documents classify the household as ‘below the poverty line’. The family has a roof over its head but no education. Their home, a new brick structure, was built from the money sanctioned under a Government-assisted scheme. The deceased woman’s husband, a landless peasant, continues to eke out a livelihood as a loader. The earnings are barely Rs 50 a day, thrice a week. The family can just about afford a diet of rice, onions and chillies. There is no money to buy milk for the children. The nearest water source (tube well) is half a kilometre away. The family has almost no contact with the health system.

As the interview of the mother-in-law and the husband progresses, a clearer picture emerges about the causes and circumstances leading to the woman’s death. The deceased woman had delivered at home with help from her mother-in-law. When the placenta did not come out, the family called a lady health visitor who took it out. Subsequently, the woman complained of pain in her limbs and a local ‘practitioner’ (village quack) was called in. He gave her an injection. The woman died seven days after delivery. The ANM had spoken to the family about the Janani Suraksha Yojana and urged them to have the woman deliver at a health facility. The family, however, argued that three children were born at home earlier, and there was no reason to go to a hospital. Even the monetary incentive was not compelling enough because the family feared there would be other costs which would not be covered by the government scheme. The surviving child is being looked after by the grandmother, who, even today, has implicit faith in her ‘village doctor’.

This vignette from Nuapada brings home the daunting situation faced by the government’s schemes to promote institutional deliveries and the circumstances under which the MAPEDIR process is being put into place in some of India’s poorest and most remote villages.

realising its full potential. The state is characterised by vast inter-district disparities. The districts located in the coastal alluvial plain, mostly inhabited by non-tribals, are far more developed than those located in the interior, inhabited largely by tribal communities.

Both Koraput and Nuapada10 have large tribal populations, and fall within the under-developed southwestern part of Orissa known as the KBK region. Currently, Koraput and Nuapada are among the eight predominantly tribal Navajyoti districts11 in Orissa implementing MAPEDIR. The other MAPEDIR districts are Bolangir, Kalahandi, Malkangiri, Nabarangpur, Rayagada and Sonepur.

Data on the percentage of women receiving skilled attention during pregnancy underscores the disparities across the state. An official source (DLHS 2002-2004) pegs institutional delivery in Nuapada at 24.9 per cent and in Koraput at 19 per cent. The percentage of women who received full antenatal care was 19 per cent in Nuapada and 13 per cent in Koraput.

10 The District of Nuapada was a part of Kalahandi District until early March 1993, when for administrative convenience, Kalahandi District was divided into two parts i.e. Kalahandi and Nuapada vide State Government Notification No. DRC-44/93/14218/R. dated 27 March 1993.

11 Navajyoti districts are characterised by high IMR, tribal population, lack of health education, and lack of awareness about existing health facilities.
Feedback from the field:

According to an Orissa government official, "MAPEDIR will reveal to us what we do not know. The present system tells us that so many mothers are dying of post partum haemorrhage (PPH) – the immediate medical reasons. But this is not enough. To prevent these deaths, we need to know a lot more. We need to know the situation at facilities – blood banks, ability of instruments, specialists at community health centres and so on. Sometimes the specialists are there, the instruments are there, blood is available, but patients do not arrive in time. So even if the system exists, we are not able to prevent the deaths because PPH is something which has to be treated within a limited time. If we cannot act in time, life is lost. MAPEDIR will help us find out the causes of delay of a mother reaching that health centre where we are providing so many facilities.

“We have embarked upon many activities but the desired results are not there because we are not hitting at the specific factors that are responsible for maternal deaths. These are the non-biological or non-medical factors which make people stay at home or in places where the specific facilities to tackle this problem are not available. They stay there and die. Through this process, if we can pinpoint the specific reasons for maternal deaths in a district like Nuapada, then while formulating maternal health strategies/interventions, the government can incorporate these factors instead of placing specialists everywhere... Right now, there is no dearth of funds; but we have to use the resources in a way that can produce results... The Orissa Government was convinced of the utility of this tool (MAPEDIR) and therefore implementation was extended to all eight Navajyoti districts."

Dr Santosh Mishra, Deputy Director (Nutrition) and Nodal Officer, Navajyoti Scheme,\(^\text{12}\) Orissa, echoes the same faith in the MAPEDIR process: “Being a gynaecologist, I know about maternal mortality and also infant mortality. In spite of many plans and projects, Orissa’s MMR and IMR remain very high. If the causes as well as our shortcomings can be pinpointed, MMR and IMR can be tackled effectively. MAPEDIR can help us use our manpower better...”

While existing data give broad indicators and the aggregate picture, they do not offer sufficient insights into all the factors that lead to maternal deaths.

The early days of MAPEDIR in Nuapada and Koraput (2005) offer valuable insights into some of the tough issues representatives have to grapple with in places where a healthcare-seeking culture is almost non-existent. This, along with low awareness and low literacy levels, constitutes key challenges to improving maternal health in both these districts. The multiplicity of prevalent dialects further compounds the demands on outreach work.

Naturally, a great deal of effort needed to be put in to create the right atmosphere to pilot maternal death reviews in Nuapada and Koraput. From January to June 2006, UNICEF supported several state-level advocacy workshops in

\(^{12}\) The Navajyoti Scheme was launched by the Orissa Government in April 2005 to deal with the challenge of high neonatal mortality and to encourage institutional deliveries.
partnership with the Orissa branch of the White Ribbon Alliance. These were occasions to sensitise key stakeholders such as faculty members of medical colleges, officials from the state institute of health and family welfare, UN agencies, NGOs and state officials.

Discussions aiming at convergence between the IMR mission and MAPEDIR had started earlier. Meetings were also held to sensitise district officials on the MAPEDIR process. Training of district level investigators began in April 2006 and lasted till the end of the year.

Grassroots Efforts

Initially, MAPEDIR encountered strong resistance in both Nuapada and Koraput. In many instances, interviewers discovered that families where a maternal death had taken place did not want to speak at all. Many families said “The dead woman has gone. She will not come back. Why are you asking so many questions?” The response was not surprising because health services were not reaching these remote rural communities, admit officials. So the advice to the interviewers was: “When you get resistance, do not persist on asking questions. Leave them alone. Later you must go back.”

“If you go to a remote tribal village and ask the questions in Oriya (state language), no one will understand. Therefore, in KBK districts interviewers must frame the questions in local dialects... In the group discussions, many of the interviewers were encouraged to ask questions in local dialects,” observes Dr Suresh Chandra Mishra (previously the Nodal officer for the Navajyoti scheme), who oversaw the MAPEDIR process in Orissa in its early phase.

During the training session, it was impressed upon the participants that the outcome of the maternal death review depended as much on their familiarity with the family as their way of asking questions. Therefore, good verbal communication skills and interviewing techniques were vital. Interviewers were asked to empathise with the circumstances of the family where a maternal death had taken place. They were asked to frame the questions in a manner that would not hurt the bereaved family. The accuracy of reporting was also emphasised. “If we do not want this to become another stereotyped government programme, we have to invest time so that we get the correct answers. We should be very clear that the information we gather is in accord with the actual events,” adds SC Mishra.

People, Partnerships and Possibilities: Forging Linkages, Strengthening Systems

NGOs in Orissa have emerged as an important institution playing a vital role in social development and improved healthcare delivery. A key feature that can be counted as an achievement in Nuapada is the unmistakable enthusiasm of the District Project Management Unit (NRHM) and of Srusti, the local NGO whose partnership offers much-needed support for evidence-based advocacy and monitoring, which are an essential feature of the MAPEDIR process. Srusti, an affiliate of the White Ribbon Alliance for Safe Motherhood, is ideally situated to spread awareness about key issues affecting maternal health.

At present, it is too early to gauge the extent of the impact of MAPEDIR on maternal mortality ratios in specific districts in Orissa but it has set in motion processes that could have a lasting impact. For example, health workers point out that the concept of the ‘3 delays’ underlying maternal deaths is getting better known. MAPEDIR is also generating awareness about government schemes such as the Janani Suraksha Yojana (JSY). Further, the community-based social audit of maternal deaths is being carried out with the support of
the Health and Family Welfare Department, the Department of Women and Child Welfare as well as NGOs. This is forging bonds and helping to identify bottlenecks. “It is telling us where we need to strengthen our services and infrastructure. As a result of MAPEDIR, we are becoming more alert. Blood storage facilities in health centres are improving and first referral units (FRUs) are getting strengthened,” says Dr Santosh Mishra.

The wake-up call is not just for officials but also for communities. In Koraput, a key factor contributing to maternal deaths is lack of transport from remote villages to health facilities. “In the tribal pockets, many women die of post partum haemorrhage because they are severely anaemic. On top of that, they deliver at home with the help of untrained attendants. But now, we hope local evidence generated by MAPEDIR will convince people to go to hospitals. Fortunately, awareness about government incentives for institutional deliveries is also increasing”, adds Mishra.

Notable findings of MAPEDIR in Orissa
A Snapshot from Koraput

“In 2003-2004, the recently upgraded PHC at Laxmipur reported 60 institutional deliveries. In 2005-2006, the figure had shot up to 221. Much of the change is due to the monthly meetings held at Gram Panchayats. During such meetings we promote greater awareness about the reasons behind maternal and infant deaths and the benefits of JSY which supports institutional delivery,” says Indira Panda, a Lady Health Visitor working at the upgraded PHC at Laxmipur block.

MAPEDIR is helping tone up the Koraput district health system through an orientation training programme for health workers. Panda, an LHV, says her understanding about the maternal deaths in her area has increased appreciably after the training and after investigating a few maternal deaths. “I knew the medical causes of maternal mortality in my area: bleeding, obstructed labour, sepsis, toxaemia and anaemia. But after my training in MAPEDIR, I also came to know about the non-medical reasons for maternal deaths: the three delays. Now I know that delays can be at three levels – the delay in decision-making at the family level stemming from lack of awareness about danger signs, the delay in transport from home to facility and in referral transport from one facility to another facility, and finally the delay in receiving medical care after reaching a health facility,” she elaborates.

Following the launch of MAPEDIR, ASHAs – the local village-level link workers have been directed to arrange for referral transport at the first stage of labour pain in a woman. This, Panda hopes, will save many lives.

State Action

“A recent government directive states that in case of obstetric emergency, the Block Development Officer (BDO) can arrange referral transport. The need is at its most acute during the rainy season when roads are flooded. So transport arrangements have to be requested and planned in advance. At the block level, once in every two months, we are also conducting PRI meetings to review progress and familiarise ourselves with the new initiatives and schemes,” says Sudhakar Buroi, Block Development Officer, Laxmipur.

“One of the biggest barriers is lack of knowledge. Health-seeking behaviour is almost absent in many rural areas. Making families think that a maternal death is an issue at all, is the single biggest challenge.”

Biswajit Padhi
Head of Srusti, UNICEF’s NGO partner in Nuapada
**MAPEDIR Initiatives and Impacts**

MAPEDIR, in conjunction with other initiatives, is setting up a State Maternal and Child Survival Cell with an independent consultant to oversee Skilled Birth Attendance (SBA). Along with Prevention of Parent to Child Transmission (PPTCT) of HIV and Malaria, MAPEDIR is helping bring about many of the changes envisioned under NRHM and RCH II. UNICEF is part of the effort to train skilled birth attendants in Koraput and other Navajyoti districts. It is also supporting operationalisation of FRUs. Blood transfusion facilities have already been strengthened in 35 FRUs in Navajyoti districts.

**Some Instructive Inferences and Pointers**

The relatively slow pace of the MAPEDIR rollout in Orissa underscores the need for better coordination between health schemes and ICDS in some blocks, and between the District Programme Manager (DPM) who is responsible for overseeing initiatives under the National Rural Health Mission, and the Chief District Medical Officer, the face of the public health system in a district.

Frequent transfer of key officials at the state- and district-level is a key bottleneck, standing in the way of an administration really taking ‘ownership’ of a public health intervention. There is also persistent fear amongst some that an improved maternal death reporting system may not be politically expedient in the short term. All this is often superimposed on general apathy characteristic of government departments.

Ground-level challenges confronting health workers include weak health systems and a situation where most rural women still prefer to seek care from a variety of non-professional sources when they are in trouble during pregnancy and childbirth. Crushing poverty combined with lack of education and awareness create a deadening apathy in which the biggest challenge, as Srusti’s Head, Biswajit Padhi points out, is to make communities perceive maternal and child survival as worthwhile goals.

In the field, health workers are up against many more hurdles. Sometimes those who need to be interviewed are not present despite prior appointments. As daily wage earners, they cannot afford to let go of any work that comes their way. This necessitates repeated visits by health workers, which creates its own logistical challenges, as interviewers often do not get adequate mobility support/remuneration to go to places that are already handicapped by poor road connectivity and which get waterlogged during heavy rains.

These and related issues came to the fore at a recent meeting of MAPEDIR interviewers, presided over by the Srusti representative and the District Programme Manager of the National Rural Health Mission at Nuapada. Feedback from the field pointed to the urgent need to step up supervision at every stage of the MAPEDIR roll out. Without adequate supervision of data collection, data analysis and data sharing, scaling up MAPEDIR across eight poor and backward districts would become an exceedingly difficult task.

An important lesson from the experiences in Nuapada and Koraput is that enthusiasm at the state level does not automatically percolate down to the rank and file in the districts. Special efforts have to be made to bring the district bureaucrats on board. There is an urgent need to sensitisise district health officials, especially the Chief District Medical Officer, about the significance and benefits of MAPEDIR.

In recent times, however, there have been some signs of progress. Anecdotal evidence from the Navajyoti districts, cited in this working paper, suggests a movement forward. The rate of institutional deliveries in the state as a whole has gone up from 23 per cent during 1998-99 to 39 per cent in 2005-2006, according to the latest National Family Health Survey (NFHS - III). Rural women even in remote villages in a tribal dominated district like Koraput are coming forward and opting for institutional deliveries.
Saving mothers and children in the desert state

Health workers seldom visit Biharipura. This remote village in Rajasthan’s Dholpur district has 100 inhabitants, mud huts and no electricity. The Chambal ravines, infamous for infestation by outlaws, are close by; and a road journey can be risky. The nearest health centre is 6 km away. Yet here, amongst families of subsistence farmers, one can strangely feel the catalytic effect of MAPEDIR.

In January 2007, Geeta, an unlettered woman from Biharipura, delivered a healthy baby at the nearest community health centre (Bari block). Within three hours of delivery, she was haemorrhaging. Geeta would have died but for the birth preparedness plan the family had worked out when Geeta was seven months pregnant. So, unlike most rural households in India, they did not waste time. Geeta’s family had a telephone number they could call during an emergency – the 24-hour Janani Suraksha (Safe Motherhood) Helpline. The doctor at the Bari CHC also sent an SOS advising Geeta’s immediate referral to the Dholpur district hospital as the CHC did not have a blood bank. The Helpline Coordinator arranged for transport within minutes and Geeta arrived at the Dholpur district hospital.

Timely blood transfusion and medical care saved the mother and her baby. The family redeemed the expenses they had incurred on transport from the money they got from JSY, the central government’s scheme for providing cash assistance to pregnant women who opt for institutional deliveries.

This happy turn of events was not a coincidence. It was the result of sustained efforts in rural Dholpur by a local NGO, Mangalam Sewa Samiti. Ashok Tiwari, who heads the NGO got the idea of the 24-hour Helpline for obstetric emergencies when Mangalam, guided by UNICEF, started MAPEDIR in two blocks in Dholpur in 2005.

“We realised that the past deaths could have been prevented. We also realised we were in a unique position to intervene and stop such deaths in future. We knew the local people, we were familiar with the government structures, and we also knew what facilities were available locally. Then, we looked back at the three delays that caused the maternal deaths we had investigated in the district.”

“The next stage was setting up interventions at the local level to deal with each delay. The first delay is at the family level. So, we started sensitising families about danger signs during pregnancy and impressed upon them the need to act quickly. We told them the birth of a child in the family required planning and we helped them develop a birth preparedness plan. This was a contingency plan keeping in mind the sudden need for various things – money, blood, transport,” says Ashok Tiwari.

To be sustainable in the long-term, the initiative also required the involvement of a health worker or a local village level motivator like the ASHA Sahyogini. So Mangalam and UNICEF persuaded the then Special Secretary Health, who also headed the state chapter of the National Rural Health Mission, to issue a directive to Dholpur’s Chief Medical and Health Officer and the District Programme Manager of NRHM, to support NGO initiatives. Thereon, it became easier, recalls Tiwari. Today, traditional birth attendants trained as “motivators” by Mangalam escort pregnant women to government health facilities for delivery, saving mothers and children from an untimely and preventable death.
The next steps in taking MAPEDIR forward in Nuapada and Koraput include involving the District Collector more closely with the process at the district level and advocating more strongly with the Director of the National Rural Health Mission and the Department of Family Welfare at the state level. The ongoing partnership with the state chapter of the White Ribbon Alliance is expected to accelerate implementation, and strengthen monitoring and community sensitisation. The UNICEF State Office’s alliance with the Orissa Red Cross Society and the State Blood Transfusion Unit will also be leveraged to strengthen the blood transfusion services at First Referral Units as part of toning up the health system – one of the key objectives of the MAPEDIR process.

**C. DHOLPUR, RAJASTHAN**

The maternal mortality rate in Rajasthan state has declined from 508 in 1997-98 to 445 in 2001-2003, but is still significantly higher than the country average of 301. Women die during pregnancy, childbirth, and soon after, due to medical causes that are well-documented. But the silent tragedy persists in the countryside because the underlying causes of unsafe motherhood are often not adequately addressed. Saving mothers in Rajasthan entails battling nature and prejudice side by side.

A maternal death is an extreme consequence of the widespread neglect of women in the state, but there are other telling indicators of male-female differentials and the low status accorded to most women. Many districts in Rajasthan have an adverse sex ratio for females pointing to widespread and illegal female foeticide. In 1991-2001 Rajasthan recorded the highest growth in literacy rate in India, moving from 38.6 per cent to 61.03 per cent. But the female literacy rate is

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**The first steps**

“We felt it was important to have unbiased parties collecting information in order to gain accurate insights into the circumstances leading to maternal deaths. Local civil society representatives were neutral parties and potential partners.

For us, this was also a valuable opportunity to enhance the capacity of the civil society on maternal death issues. We, therefore, initiated the process of maternal death enquiry by building the capacity of local NGOs to collect accurate information in a scientific manner. The process was initiated with Mangalam Sewa Samiti in Dholpur. This was our learning and testing ground. The analysed data was shared with the community and other stakeholders. This inspired the creation of the Janani Suraksha Helpline. The feedback from the community helped us generate awareness of danger signs and birth preparedness. Subsequently, several civil society networks in other districts were also trained in MAPEDIR. These were Action Research and Training for Health (ARTH) in Udaipur; Shiv Shiksha Samiti in Tonk; PRAYAS network in three districts viz., Barmer, Dausa, Dholpur; and ARAVLI network in Baran and Jhalawar.

To date, about 50 persons have been trained in implementing MAPEDIR and 72 maternal deaths have been reviewed (40 in Dholpur, 15 in Udaipur, and 17 in Tonk).”

Dr Pavitra Mohan
Project Officer, UNICEF, Rajasthan
41.8 per cent, and literacy levels, especially for girls, remain among the lowest in the country. The health indicators of the district are telling: According to the District Level Household Survey (DLHS 2004), Dholpur has a high birth rate (26.53). The mean age at marriage for girls is 17.4 years. Only 39 per cent of all deliveries were conducted by skilled birth attendants (DLHS, 2003-2004).

A common thread runs through the stories of maternal deaths in rural Rajasthan: the women who died had little control over their lives, minimal access to basic services, and little exposure to the outside world. The deceased were victims of gross neglect either by their families or their community or the health system – sometimes, all three. The circumstances that led to their death are not unique to Rajasthan. But they are exacerbated by the state’s poor infrastructure, weak health system, scattered population, and socio-cultural practices that continue to discriminate against girls and women.

In 2008, maternal survival therefore remains one of the most pressing challenges confronting the desert state as it seeks to carve a new future for itself, and better its record in human development.

**Implementation**

MAPEDIR was initiated as a modest initiative in one block of Dholpur district in 2005 (Baseri) and extended to another block (Bari) in 2006. It is one of three districts in Rajasthan currently implementing MAPEDIR. The other two districts are: Tonk and Udaipur. In preparation of the project, the first Training of Trainers session took place in June 2005, and the first batch of MAPEDIR interviewers were trained around October in the same year.

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Our workers faced resistance at the start because of entrenched attitudes and the prevailing low status of women, lack of education, low awareness, illiteracy, cultural practices, beliefs etc. But then when we started telling people about what we had uncovered while reviewing maternal deaths in this very district, they started to listen. We did not use technical language, nor go into too many details. But we shared the broad findings – that were within everyone’s grasp. These deaths were taking place around them, and we told them the underlying reasons. It is this local evidence that snapped people out of apathy. Earlier, people had never really linked their actions to the deaths. But when we started pointing out the linkages, they started thinking differently. In one instance, there was no one at home to take a decision where to take the expectant mother, and the woman bled for two hours. The family did not perceive this as a ‘delay’ because they believed that bleeding was normal... and did not see any danger in a woman bleeding for two hours or so. They were simply unaware of danger signs and the village dai had told them not to worry.”
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Ashok Tiwari, Mangalam

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13 District Level Household Survey (DLHS) conducted under the aegis of the Government’s RCH Programme.
many within the establishment feared reprisals in case instances of neglect came to light. UNICEF Rajasthan and Mangalam overcame some of these teething problems by advocating for the verbal autopsy tool with the highest authorities in the state government while also seeking their assurance that no penalisation would take place. Eventually the data generated by the maternal death reviews in the two blocks in Dholpur provided powerful ammunition to win over the community’s as well as the government’s backing for MAPEDIR.

Case studies were shared with the community during Jan Sunwais (public hearings) in Dholpur and in Jaipur, the state capital. UNICEF officers shared the analysed data with top health officials in the state and advocated strengthening of state-wide notification of maternal deaths as well as official support to the death inquiry process.

As a result, large increases were seen in maternal death notification. By October 2007, about 70 deaths were investigated and analysed across Dholpur and Udaipur districts. The data emerging from the inquiries have brought forth several issues for local action.

**Notable Finding of MAPEDIR in Rajasthan**

**Demographics of Maternal Death**

Around 44 per cent of the maternal deaths in Dholpur occurred at the deceased woman’s or her relatives’ home and 28 per cent on the way to a health facility; 85 per cent of the deaths occurred during labour or within 42 days of delivery. More than 50 per cent of families experienced a first delay greater than one hour, and about 40 per cent experienced a second delay greater than one hour; 60 per cent of the deceased women were grand veterans of four and above, pointing to the effect of multiple births on maternal survival. The most important causes of death were APH (ante partum haemorrhage) or PPH (40 per cent of the women), sepsis (20 per cent), and anaemia (16 per cent). A significant number of maternal deaths occurred either on the way to the health facility or in-between the facilities. Typically there was delay in transportation.

The key messages emerging from the maternal death inquiries are that the delays in seeking care and reaching the appropriate health facility need to be reduced. This can be accomplished by promoting awareness of how to recognise the signs of an obstetric emergency and actions to be taken, including planning for transport availability, knowing where to take a woman at the time of an emergency, and setting aside funds for emergency care.

**Obstetric Helpline**

Following the death reviews in Dholpur, hundreds of participants gathered together in dozens of village-level and multi-sector government meetings to discuss the findings of the death inquiries and possible actions. Realising the importance of a functional referral transport system in saving the lives of pregnant women in an obstetric complication, the district administration partnered with UNICEF and a local NGO to set up an “obstetric helpline” (see Box 13) throughout the district. Networking of various private and public vehicles and locally identified mobile phones forms the core infrastructure of the helpline, which has been made financially sustainable by linking it with JSY.

**Chain Reaction**

While Dhanukapura showcases the powerful catalytic role that MAPEDIR and its partners can and do play, much still remains to be done. As Rekha Devi, an ASHA worker points out: “There are families where no one is literate. And awareness levels about maternal and child health are very low. Some families would not even let an infant be weighed because they believe it would attract evil spirits!”
Box 13: Janani Suraksha Helpline

The 24-hour Janani Suraksha Helpline was launched in January 2006, about six months after maternal deaths had begun to be reviewed in Dholpur. Part of a package of interventions to reduce maternal mortality, the Helpline aims to lower maternal deaths by addressing the three critical delays: delay in deciding to seek medical care, delay in reaching a place where care is available, and delay in receiving appropriate care.

First delay: Birth Preparedness – A team of five field workers contacts families of pregnant women in their work area and helps them prepare for the birth of the child. The team counsels the family on danger signs, alerts them about the need to arrange funds in advance for contingencies, transport, and blood, if necessary, and also informs them about the Helpline. A Birth Plan prepared by the field workers is kept with the family, while they retain a copy. To date, close to 40 per cent of all births in Bari block have been tracked.

Second delay: Organising Transport – This is the crux of the remedial intervention strategy. In Bari, the physical distances between women and the reproductive health services are considerable. Vehicles are often not available at times of emergency or are expensive when available. To facilitate rapid referral during emergencies, the Helpline maps resources in every village in the block, listing every vehicle and phone in the village. The birth plan includes these provisions as well as the contact details of the owner of the vehicle. In case a vehicle is not available locally, the family is urged to call up the Helpline, which is manned 24x7 by an NGO facilitator. The telephone number of the Helpline is given wide publicity through wall graffiti and other means.

Third delay: Negotiating the Health System – One of the strongest elements of intervention is support for the families once they reach the hospital. There are times when a hospital has refused or failed to provide quality medical care, and the concerned families have approached the district collector to intervene. Interventions from the Helpline have helped too, with the resultant benefit of a better interface between the community and the health system.
“If we find that in a particular place, most deaths are due to delays in decision making at the family level, we know that behaviour changes are urgently required. And we can strengthen the work of the village link worker or ASHA sahyogini and the ANMs. We also need to know whether delay due to lack of referral transport is at the level of the first health facility or the second health facility. The bottom line: we need information which tells us which interventions need strengthening and where. If the delays are at the facility-level, then the facilities need strengthening.”

SP Yadav
Director (RCH), Directorate of Medical and Health Services, Rajasthan

Partnerships with NGOs, Asha Sahyoginis, existing governmental schemes and workers have been vital to building a strong community base for MAPEDIR.

As a result of the MAPEDIR process, many more families are receptive to the idea of birth preparedness plans. Even as the 24-hour Helpline has gained in popularity, communities are themselves taking charge of their own destiny (see Box 14), arranging their own village-based referral transport and calling the Helpline in the most critical cases. Forty vehicles are now on call for referral transport during obstetric emergencies across 170 villages in Dholpur’s Bari block.

State Action: Strengthening the System
Based on MAPEDIR’s success, a directive making maternal death notification and audit compulsory has been drafted and is being reviewed by the state government. The maternal safety helpline has been scaled up to cover the whole of Dholpur district and MAPEDIR is lately also being implemented in Udaipur district. In addition, death inquiry teams including government officials and an NGO representative are being set up in four districts to offer relevant advice to their district health societies.

Lessons Learned
The biggest challenge on the ground is the lack of knowledge and awareness about factors contributing to maternal deaths among rural households. A lot more needs to be done to bridge the gaps in awareness among about the need to take appropriate action in the event of an obstetric emergency and to take the woman to the right health provider on time. Much more also needs to be done to mobilise communities and the health system to ensure that money and transport services are available in an obstetric emergency. The MAPEDIR evidence points as well to the need for greater awareness of government schemes and incentives to encourage women to deliver at institutions and ensure safe motherhood. The data also raises ethical issues and concerns about the quality of care disbursed by the public health system.

“For the past two years, I have been visiting 10 houses every day. Wherever there was a pregnant woman, I drummed the message of the need for regular antenatal checkups, and the need to be aware of potential complications. A lot of my time went to making families aware of the danger signs that can potentially put a woman at risk during pregnancy, childbirth or soon afterwards. I also stressed the need for adequate nutrition because anaemia is widely prevalent. Families are poor so you have to tell them about vegetables and fruits they can afford. Many pregnant women have to work in the fields and I reminded them to take care of their diet and to take enough rest.”

Rekha Devi, the village ASHA
Follow-up Action

MAPEDIR has the potential to mobilise civil society and communities around maternal health. That it can be scaled up state-wide through civil society networks, is being proved by the Dholpur model. However, greater advocacy is needed still to penetrate pockets of apathy within the community and system. Concretely put, this means following up on the proposed directive to make maternal death notification compulsory, building capacity of the health system to follow this directive, and supporting the NGO networks in implementing the maternal safety helpline.

Promising examples are evident in Udaipur where, with UNICEF support, the District Heath Society has set up a system of 100 per cent maternal death notification and inquiry. The Society (chaired by the Collector) is committed to review each maternal death in the monthly meeting. Notification and inquiry have already started.

Based on the project’s positive experience, starting in 2008, UNFPA and UNICEF would together be supporting MAPEDIR in a few districts in Rajasthan. These and other partnerships are expected to promote greater success, scaling up and sustainability of MAPEDIR.
THREE BACKWARD STATES LOOK FORWARD

A. Guna and Shivpuri, Madhya Pradesh

» Madhya Pradesh is a vast sprawling state with poor road connectivity, a dismal health system and a highly illiterate and poor population (37 per cent BPL compared to the national average of 26 per cent), according an extremely low status to its women.

» Faced with a dauntingly high MMR and IMR, MAPEDIR partnered with already established developmental schemes like “Village Planning” to give impetus to its process.

» The MAPEDIR process has had a catalytic effect in inspiring communities and NGOs to work in tandem to provide a round-the-clock referral transport system for obstetric emergencies.

» Thanks to a newly alerted administrative machinery, health audits have been initiated in all Gram Panchayats of Guna district and upgradation of medical facilities at several health centres to handle round-the-clock obstetric emergencies have increased institutional deliveries and brought down maternal deaths dramatically.

B. Nuapada and Koraput, Orissa

» Blind superstition, diehard faith in ancient systems and ignorance of modern medical methods are naturally rampant amongst tribal families subsisting on less than five dollars a week in this cyclone-battered state.

» Keeping local attitudes and sensitivities in mind, MAPEDIR sought the support of Srusti, a local NGO and an affiliate of the White Ribbon Alliance for Safe Motherhood, which was ideally situated to spread awareness about timely healthcare intervention and institutional deliveries – key issues affecting maternal mortality.

» The advent of MAPEDIR in Orissa has strengthened the services and infrastructure of government departments: blood storage facilities in FRUs are improving and the rate of institutional delivery in the state has gone up from 23 per cent during 1998-99 to 39 per cent in 2005-2006.

C. Dholpur, Rajasthan

» Saving mothers in Rajasthan entails battling nature alongside prejudice, since more than 60 per cent of the state’s land is an arid desert with scattered villages and poor road connectivity; and poverty combined with deeply entrenched biases against females affect women’s access to health services in large pockets made up of scheduled castes and tribes.

» Currently running in the Dholpur, Udaipur and Tonk districts of Rajasthan, The MAPEDIR process was initiated in June 2005 by building the capacity of local NGOs like Mangalam, ARTH, ARAVLI and PRAYAS to collect accurate maternal death information in a scientific manner.

» The data emerging from the inquiries brought forth several issues for local action at different levels: birth preparedness plans in families, financially sustainable maternal help lines in the communities and a directive making maternal death notification and audit compulsory at the state level.
As a country with one of the highest number of maternal deaths, India’s success in reducing maternal mortality is critical to meeting the global target approved and adopted by the United Nations as the fifth Millennium Development Goal. Though considerable progress had been made earlier in reducing maternal deaths, the change is not so dramatic recently, and in many countries giving birth continues to be most risky. Today, in India, and more generally in South Asia, maternal mortality remains essentially a predicament of poor people, and a product of poor healthcare delivery.

2007 marked the 20th anniversary of the Safe Motherhood Initiative. This was a defining moment also for India. With its vastness, diversity and complexity, India encapsulates the obstacles and the opportunities that lie ahead in the battle for safe motherhood in developing countries. Political will, passionate commitment and innovative policies and practices can transform India while providing a better future for its mothers and leading the way for similarly situated women in other countries struggling to win the battle for survival. Failure to do so seems inexcusable when millions of women are being senselessly lost to a certain but preventable death from the complications of pregnancy and childbirth.

In turning the spotlight on the unseen and unsung, MAPEDIR is speeding up the process within the country while building on excellent local models (Chandigarh, Tamil Nadu). The information and insights emanating from the community-based social audit of maternal deaths are sparking change in some of India’s most desperately poor and remote pockets. Some notable examples of this transformation:

- **In Purulia, West Bengal**, preliminary findings from the MAPEDIR process convinced the Government of West Bengal to consider expanding the scope of existing government-aided schemes such as JSY, to cover APL (above poverty line) and BPL (below poverty line) women, including those in urban areas. The JSY integrates cash assistance for antenatal, delivery and postnatal care in a health facility and is coordinated by a field-level health worker. MAPEDIR is now part of the official policy of the West Bengal Government – which can be gauged by the state government’s decision to issue a directive that *every maternal death be inquired at the community level*.

- **In Udaipur, Rajasthan**, the District Health Society has incorporated MAPEDIR as one of its activities and it now figures in the agenda of the Society’s review meetings. As of July 2007, the district administration had started carrying out verbal autopsies of maternal deaths in four blocks of Udaipur district, namely, Jhadol (Sarada), Salumbar, Sanwad, and Vallabhnagar. To strengthen the capacity of the district health system to conduct the death inquiries, the assistance of NGOs such as ARTH has been sought in two blocks, while in the other two blocks the district health system is directly conducting routine notification and verbal autopsy of maternal deaths.

- **In Madhya Pradesh**, the MAPEDIR process led to the initiation of health audits in all Gram Panchayats since January 2007. Such audits review five main issues: maternal deaths, ANC registration and checkups, immunisation coverage, institutional deliveries, and cataract detection and operations in the panchayat limits. Other welcome fall-outs from the MAPEDIR process include: Arrangement of 22 referral transport vehicles round the clock within the government system and the operationalising of seven institutions to conduct deliveries (both in Guna block).
Nine more will be operational by the end of the year.

In many other cases, communities have been transformed by the interview process. Village councils are holding meetings to discuss the findings from the maternal death reviews, developing interventions such as the community-based emergency referral transport system in Purulia. In Dholpur, village-level transporters are now part of the movement to save lives. Such local action has kept the emergency transport systems operational even through civil unrest and crises situations, saving the lives of many mothers who may not have otherwise made it to a health facility.

Maternal death reviews are narrowing the knowledge gap. The process of interviewing and being interviewed has led to greater awareness, not just among women and families, but also among health personnel. In addition, MAPEDIR has been instrumental in making invisible problems visible and fostering wider use of governmental programmes and provisions on maternal safety among communities who were unlikely to benefit from it in the past.

In less than three years, MAPEDIR has proved its potential in more than a dozen districts across India where women are at high risk during pregnancy and at childbirth. But much more needs to be done for the early phase achievements to be consolidated and obstacles to be turned into opportunities. Field visits to six districts in the first quarter of 2007 helped identify many of the missing links. In 2008, more districts and more states started to expand the model.

Some Necessary Spadework
The competence of the MAPEDIR interviewer is central to the success of the tool. In most cases, those who are asking the questions and those who are answering them are new to the concept of tracking the sequence of events contributing to the maternal death. Part of the challenge facing MAPEDIR is to acclimatise interviewers with the format of the questionnaire. Many health workers who are currently collecting data on maternal deaths are not used to filling up questionnaires requiring detailed responses to such events. In many cases, the families have never thought about the issues brought to the fore by the social audit; in others, they are on the defensive, fearful of being blamed for neglect. In such a context, UNICEF experience indicates that it is imperative the interviewer succeeds in allaying their fears and creating a comfort zone in which the respondents speak freely.

Where families and communities are constrained not only by resources but also by illiteracy and cultural inhibitions, a critical need for the interviewer and others implementing MAPEDIR is to educate and sensitise them about the basics of health, hygiene and maternal health. Without this preliminary spadework, families are unable to grasp the meaning of many questions and therefore cannot fully participate in the maternal death social audit.

Teething problems of the maternal death audit process also include the lack of smooth functioning of the computer software for processing and analysing the MAPEDIR data. This is now being tackled through corrective measures such as training and orientation of the interviewers and others in the software’s application. Another challenge is stepping up awareness among state and district level bureaucracies about the ground-level reality for poor, pregnant and powerless women and the significance of MAPEDIR. In some states, the state governments have given an enthusiastic reception to MAPEDIR but this stance needs to percolate down to district administrations.
In the early stages, a key problem is the fear of local bureaucracies about the tool’s role in pushing up maternal death statistics. This is a sensitive issue. Much of the resistance witnessed towards effective implementation of the MAPEDIR process is connected with this fear which needs to be addressed and overcome. It must be impressed upon the district administration that in the early stage, MAPEDIR will improve maternal death reporting. As a result, on the surface, it may appear that more maternal deaths are taking place. The same perspective has to be conveyed to the public and policy makers so that they appreciate the process and are not suspicious of it.

The biggest challenge to competent tackling of the audit is supervision of the death review process. Even with the best of efforts, interviewers will falter if they are not supervised regularly. A diligent overview can take place only when the local administration takes full ownership of the MAPEDIR process and views it as integral to its broader human development goals and strategies. Further, in districts where there has been almost no supervision since the inception of the programme, partnerships need to be forged with local institutions such as faculties of medical colleges. These links can then be leveraged for district-level monitoring and supervision.

So far, this has happened most visibly in Purulia, based on which experience, several tested ways have emerged to take the MAPEDIR strategy and components forward. Although poor, the district of Purulia had the advantage of a socio-political context which encouraged the development of community-structures and Panchayati Raj institutions. These are now yielding results. Other districts and states need to similarly strengthen their community structures. Women’s self-help groups (SHGs) do and can play a critical role in spreading awareness and organising community-driven transportation initiatives for expectant mothers. Since SHGs are already involved in thrift societies and income generating activities, they can generate emergency funds at the grassroots and shape the sustainability of initiatives triggered by the maternal death audits.

As in most development projects, partnerships are central to the success of MAPEDIR. The participation of NGOs has certainly kick-started the MAPEDIR process in the districts where it operates, but for long term sustainability, there has to be a closer involvement of the District’s Chief Medical Officer and his team in every district of every state. Refresher trainings are also required in districts where there has been a long gap between the original training and implementation. The newly recruited ASHAs are village-level assets and should be involved more intensely in the MAPEDIR process.

The Next Steps

In India as elsewhere maternal deaths happen due to a combination of inter-related factors. The road ahead is about innovating together, with different agencies leveraging their core competencies and working with communities, empowering them to achieve the common goal. MAPEDIR is not happening in isolation and not only because of the support of any one agency. It is a part of existing convergent efforts to reduce maternal deaths. The process is unfolding in a context where the federal government, state governments and many district administrations along with health professionals, researchers, academics, civil society networks, and other partners are taking steps to promote care-seeking behaviour and institutional deliveries to boost maternal and child survival. The interlinking of all these entities will remain a priority for MAPEDIR and a prerequisite for its success.

At the micro-level, the next steps are to simplify the questionnaire, making it easier to administer
in the new states and districts where MAPEDIR will be launched; and for districts to strengthen supervision of the interviewing process. The first step has already been taken: a simplified, shorter questionnaire has been developed, field tested and successfully launched in Vaishali district in Bihar, now the sixth state of India to undertake MAPEDIR.

At the macro-level, MAPEDIR’s next phase will include inquiries of perinatal deaths and expansion to facility-based inquiries. Eventually, it will also link up with the Integrated Management of Neonatal and Childhood Illnesses (IMNICI) – the newborn-centric Indian adaptation of the global IMCI (Integrated Management of Childhood Illness) model – when several initiatives are brought together in optimal synergy to accelerate the pace.

To make a further dent on India’s MMR, the good practices from MAPEDIR districts will have to be scaled up to include other states and districts where women are at acute risk during pregnancy and childbirth. It is also equally important to learn from the experiences in the field. Recent data indicates that even in states with relatively poor health services, institutional deliveries are going up. The retrospective assessment of causes and bottlenecks at the community level is generating evidence to fast-track decision-making and better management of human and financial resources. As institutional deliveries increase on account of government schemes such as the JSY and due to the catalytic role of MAPEDIR, there is pressure to upgrade the institutions and build capacity on quality service delivery.

For the first time, financial resources are available in the country to implement key interventions for maternal, newborn and child health. More significantly, the message from the grassroots is beginning to be heard evoking support at the highest policymaking levels. Under the National Rural Health Mission (2005–2012) and the RCH Programme, Phase II (2005–2010), the Government of India has adopted four key strategies to reduce maternal deaths. These are essential obstetric and newborn care for all, skilled attendance at every birth, emergency obstetric care for those with complications, and referral services.

However, it is not yet celebration time. India has a long way to go. It still accounts for nearly 15 per cent of the global onus of maternal deaths every year. The battle to save mothers’ lives is far from over, especially in the country’s rural hinterland where maternal mortality is at its grimmest. Yet the sparks of hope are unmistakable. The number of Primary Health Centres providing 24 hours delivery services is going up. Training sessions are taking place to expand the cadre of skilled attendants at birth. FRUs are being equipped to provide emergency obstetric and neonatal care. Professional Associations such as the Federation of Obstetrics and Gynaecology Societies of India (FOGSI) have come forward to help the Government train MBBS doctors in obstetric management skills. These are but a few examples of a movement forward.

The global commitment to achieve the target of a 75 per cent reduction in maternal mortality by

“In the days ahead, our biggest challenge will be to make sure that there are enough institutions which have the necessary manpower and facilities to handle obstetric emergencies.”

Ashok Tiwari
President of Mangalam in Rajasthan’s Dholpur district, which pioneered the 24-hour Obstetric Emergency Helpline
2015, as set out in the MDG5, provides India an extraordinary opportunity to ensure that women deliver safely. At a time when maternal health is climbing up the policy agenda nationally and internationally, and strategic choices are being made under the aegis of the National Rural Health Mission, MAPEDIR presents itself as an exciting tool with enormous potential to bring India and the world closer to the goal of MDG5.

SETTING OUR SIGHTS

» In India, as in the rest of South Asia, maternal mortality remains essentially a predicament of poor people, and a product of poor healthcare delivery.

» Where families happen to be constrained by resources along with illiteracy and cultural inhibitions, MAPEDIR has proved its potential by turning the spotlight on hitherto unseen and unknown aspects of maternal deaths and stirring communities, NGOs, academic institutions, local and state administrations as well as governments into concerned, concerted action.

» MAPEDIR has been instrumental in making many invisible problems visible and fostering wider use of governmental programmes and provisions on maternal safety among communities who were unlikely to benefit from it in the past.

» The message from the grassroots has started evoking support at the highest policy making levels, and for the first time financial resources are available to implement key interventions for maternal, newborn and child health in the country.

» Nonetheless, although much has been achieved in the backward districts of the states of West Bengal, Rajasthan, Madhya Pradesh and Orissa in the form of stepped up health audits and maternal death inquiries and notification; 24x7 obstetric helplines and upgraded institutional delivery facilities, much still needs to be done to save the lives of mothers in the country’s rural hinterland.

» Measures needed include simplifying the verbal autopsy questionnaire, regular refresher training programmes, diligent overview of the MAPEDIR process, and encompassing more states in the country into the MAPEDIR network.

» Accounting for nearly 15 per cent of the global onus of maternal deaths every year, India, recently equipped with the tried and tested tool of MAPEDIR, is taking initiatives which could be replicated and contribute substantially towards making the United Nation’s MDG5 of attaining 75 per cent reduction in maternity deaths by 2015 a distinct reality.
## Annexure 1

### Live births, maternal deaths, maternal mortality ratio in India 2001-2003

<table>
<thead>
<tr>
<th>India and Major States</th>
<th>Sample Female Population</th>
<th>Live Births</th>
<th>Maternal Deaths</th>
<th>MMR</th>
<th>95% CI</th>
<th>Lifetime Risk(%)</th>
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</thead>
<tbody>
<tr>
<td>Assam</td>
<td>2,02,943</td>
<td>19,619</td>
<td>96</td>
<td>490</td>
<td>(393-588)</td>
<td>1.6</td>
</tr>
<tr>
<td>Bihar/Jharkhand</td>
<td>3,21,721</td>
<td>42,112</td>
<td>156</td>
<td>371</td>
<td>(313-430)</td>
<td>1.7</td>
</tr>
<tr>
<td>Madhya Pradesh/Chhattisgarh</td>
<td>2,20,269</td>
<td>27,563</td>
<td>104</td>
<td>379</td>
<td>(306-452)</td>
<td>1.6</td>
</tr>
<tr>
<td>Orissa</td>
<td>2,54,176</td>
<td>20,914</td>
<td>75</td>
<td>358</td>
<td>(277-439)</td>
<td>1.0</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>2,48,891</td>
<td>31,371</td>
<td>140</td>
<td>445</td>
<td>(371-519)</td>
<td>1.9</td>
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<tr>
<td>Uttar Pradesh/Uttaranchal</td>
<td>4,62,547</td>
<td>62,659</td>
<td>324</td>
<td>517</td>
<td>(461-573)</td>
<td>2.4</td>
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<tr>
<td><strong>EAG AND ASSAM SUBTOTAL</strong></td>
<td><strong>17,10,547</strong></td>
<td><strong>2,04,238</strong></td>
<td><strong>895</strong></td>
<td><strong>438</strong></td>
<td><strong>(410-467)</strong></td>
<td><strong>1.8</strong></td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>2,51,511</td>
<td>19,152</td>
<td>37</td>
<td>195</td>
<td>(132-257)</td>
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</tr>
<tr>
<td>Karnataka</td>
<td>2,99,571</td>
<td>24,875</td>
<td>57</td>
<td>228</td>
<td>(169-287)</td>
<td>0.7</td>
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<tr>
<td>Kerala</td>
<td>2,74,990</td>
<td>16,448</td>
<td>18</td>
<td>110</td>
<td>(59-161)</td>
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<tr>
<td>Tamil Nadu</td>
<td>2,98,726</td>
<td>19,689</td>
<td>26</td>
<td>134</td>
<td>(83-185)</td>
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<tr>
<td><strong>SOUTH SUBTOTAL</strong></td>
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<td><strong>80,164</strong></td>
<td><strong>139</strong></td>
<td><strong>173</strong></td>
<td><strong>(144-202)</strong></td>
<td><strong>0.4</strong></td>
</tr>
<tr>
<td>Gujarat</td>
<td>2,19,783</td>
<td>21,220</td>
<td>37</td>
<td>172</td>
<td>(116-228)</td>
<td>0.6</td>
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<tr>
<td>Haryana</td>
<td>1,63,710</td>
<td>17,075</td>
<td>28</td>
<td>162</td>
<td>(102-223)</td>
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<td>Maharashtra</td>
<td>2,66,750</td>
<td>20,982</td>
<td>31</td>
<td>149</td>
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<tr>
<td>Punjab</td>
<td>1,42,595</td>
<td>11,090</td>
<td>20</td>
<td>178</td>
<td>(100-257)</td>
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<td>West Bengal</td>
<td>3,90,702</td>
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<td>58</td>
<td>194</td>
<td>(144-243)</td>
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<tr>
<td>Other</td>
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<td>74,890</td>
<td>176</td>
<td>235</td>
<td>(200-269)</td>
<td>0.6</td>
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<tr>
<td><strong>OTHER SUBTOTAL</strong></td>
<td><strong>22,04,238</strong></td>
<td><strong>1,75,229</strong></td>
<td><strong>349</strong></td>
<td><strong>199</strong></td>
<td><strong>(178-220)</strong></td>
<td><strong>0.6</strong></td>
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<tr>
<td><strong>INDIA TOTAL</strong></td>
<td><strong>50,39,583</strong></td>
<td><strong>4,59,631</strong></td>
<td><strong>1,383</strong></td>
<td><strong>301</strong></td>
<td><strong>(285-317)</strong></td>
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Sample registration system Maternal mortality trends-causes in India 1997-2003
## Annexure 2

### Anaemia among pregnant women, currently married (15-44 years), (percentage), 2002

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<tr>
<th>S.No.</th>
<th>State/UTs</th>
<th>Severe</th>
<th>Moderate</th>
<th>Total</th>
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<td>34</td>
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<td>-</td>
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<tr>
<td>4</td>
<td>Bihar</td>
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<td>35</td>
<td>36</td>
</tr>
<tr>
<td>5</td>
<td>Chhattisgarh</td>
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<td>41</td>
<td>46</td>
</tr>
<tr>
<td>6</td>
<td>Delhi</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Goa</td>
<td>-</td>
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<tr>
<td>8</td>
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<td>9</td>
<td>Haryana</td>
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<td>10</td>
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<td>11</td>
<td>Jammu and Kashmir</td>
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<tr>
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<td>18</td>
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<tr>
<td>19</td>
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<td>22</td>
<td>Punjab</td>
<td>4</td>
<td>50</td>
<td>54</td>
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<tr>
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<td>Rajasthan</td>
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<td>36</td>
<td>39</td>
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<tr>
<td>24</td>
<td>Sikkim</td>
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<td>25</td>
<td>Tamil Nadu</td>
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<td>37</td>
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<td>28</td>
<td>Uttaranchal</td>
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<td>29</td>
<td>West Bengal</td>
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<td>16</td>
<td>24</td>
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<td>30</td>
<td>Andaman and Nicobar Islands</td>
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<td>31</td>
<td>Chandigarh</td>
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<td>32</td>
<td>Dadra and Nagar Haveli</td>
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<td>-</td>
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<tr>
<td>33</td>
<td>Daman and Diu</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>34</td>
<td>Lakshadweep</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
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<td>35</td>
<td>Pondicherry</td>
<td>-</td>
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<tr>
<td><strong>INDIA</strong></td>
<td></td>
<td><strong>3</strong></td>
<td><strong>33</strong></td>
<td><strong>36</strong></td>
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### Fast facts

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<th>S. No.</th>
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<th>West Bengal</th>
<th>Rajasthan</th>
<th>Orissa</th>
<th>Madhya Pradesh</th>
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<td>1</td>
<td>Total population (Census 2001) (in million)</td>
<td>1,028.61</td>
<td>80.18</td>
<td>56.51</td>
<td>36.80</td>
<td>60.35</td>
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<td>Decadal growth (Census 2001) (%)</td>
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<td>17.77</td>
<td>28.41</td>
<td>16.25</td>
<td>24.26</td>
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<td>Crude birth rate (SRS 2005)</td>
<td>23.80</td>
<td>18.80</td>
<td>28.60</td>
<td>22.30</td>
<td>29.40</td>
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<td>Crude death rate (SRS 2005)</td>
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<td>6.40</td>
<td>38.00</td>
<td>9.50</td>
<td>9.00</td>
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<td>Total fertility rate (SRS 2004)</td>
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<td>3.70</td>
<td>2.70</td>
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<td>Infant mortality rate (SRS 2005)</td>
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<td>38.00</td>
<td>68.00</td>
<td>75.00</td>
<td>76.00</td>
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<td>Maternal mortality ratio (SRS 2001-2003)</td>
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<td>194.00</td>
<td>445.00</td>
<td>358.00</td>
<td>379.00</td>
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<td>8</td>
<td>Sex ratio (Census 2001)</td>
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<td>921.00</td>
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<td>9</td>
<td>Population below poverty line (%)</td>
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<td>27.02</td>
<td>15.28</td>
<td>47.15</td>
<td>37.43</td>
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<td>Scheduled caste population (in million)</td>
<td>24.20</td>
<td>18.45</td>
<td>9.69</td>
<td>34.80</td>
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<td>Scheduled tribe population (in million)</td>
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<td>60.22</td>
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<td>50.28</td>
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<td>Madhya Pradesh</td>
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<td>--------</td>
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<tr>
<td>Sub-centre</td>
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<td>9,554</td>
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<td>388</td>
<td>325</td>
<td>417</td>
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<td>Multipurpose worker (Female)/ANM at Sub Centres and PHCs</td>
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<td>12,225</td>
<td>7,206</td>
<td>10,066</td>
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<tr>
<td>Health Worker (Male) MPW(M) at Sub Centres</td>
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<td>10,512</td>
<td>5,927</td>
<td>8,874</td>
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<td>1,713</td>
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<tr>
<td>Health Assistant (Male) at PHCs</td>
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<td>1,713</td>
<td>1,279</td>
<td>1,192</td>
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<td></td>
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<tr>
<td>Doctor at PHCs</td>
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<td>1,713</td>
<td>1,279</td>
<td>1,192</td>
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<td>Obstetricians and Gynaecologists at CHCs</td>
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<td>325</td>
<td>231</td>
<td>229</td>
<td></td>
<td></td>
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<td>Physicians at CHCs</td>
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<td>325</td>
<td>231</td>
<td>229</td>
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<td>Paediatricians at CHCs</td>
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<td>325</td>
<td>231</td>
<td>229</td>
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<tr>
<td>Total specialists at CHCs</td>
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<td>Radiographers</td>
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<td>269</td>
<td>229</td>
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<td>Pharmacist</td>
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<td>1,510</td>
<td>1,421</td>
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</tr>
<tr>
<td>Nurse/Midwife</td>
<td>3,344</td>
<td>3,988</td>
<td>2,896</td>
<td>2,795</td>
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