Message from the Regional Director

MDGs to improve maternal health, directly addresses the indicators of maternal mortality (MMR). According to some that worldwide, the maternal mortality ratio (MMR) declined from 490 in 1990 to 2010, to 167 per 100,000 births in 2015. In fact, the Millennium Development Goals (MDGs) established the millennium development goals (MDG) to achieve a 50% reduction in maternal mortality by 2015. Understanding the underlying factors that lead to these deaths will continue to be vital in shaping and scaling up maternal health interventions. Therefore an investigation through a maternal death review (MDR) of all maternal deaths in South Asia region is utmost important. The maternal death review (MDR) is a story in itself, uncovering the story will throw light in the causes, circumstances, and conditions of the death. Whether the death occurred in a hospital or at home, the causes should be explored, the available factors, missed opportunities and unmet needs are identified, and evidenced-based corrective actions taken to improve the quality of services.

The WHO guide “Beyond the numbers: reviewing maternal deaths and complications to make pregnancy safer”, described five methods of MDR: 1) is known that countries in the South-East Asia Region are implementing MDRs using a combination of these methods to varying extent. To further optimise the efforts and cost of course, and moving towards a Maternal Death Surveillance and Response (MDSR), it was deemed necessary to gain more knowledge on the exact situation in countries.

The report of the Commission on Information and Accountability established under the United Nations Global Strategy on Women’s and Children’s Health makes specific recommendations on improving information, which were especially relevant given the need to improve the validity of MDR. Beyond attempting to deliver more reliable MMR estimates, the World Health Organization (WHO) is making several efforts to respond to the report of the Commission. Ongoing efforts in the area of maternal health are leading to a revision of the methodology, including the development of new tools for assessing and responding to maternal deaths.

Guidance should strengthen the management of the current Maternal Death Review programme, using an optimal mix of facility-based and community-based reviews to ensure a robust comprehensive coverage. There is need to build capacity of health staff to implement maternal death review and to respond to findings.

The WHO Regional Office for South-East Asia therefore supported five countries – India, Indonesia, Nepal, Myanmar and Laos – to conduct a study on implementing best MDR, which commenced in 2011. The report of these studies, along with a synthesized regional report, will now be shared with the stakeholders in all countries of the region and beyond.

Ms. Prasun Khetrapal Singh
Regional Director
World Health Organization, South-East Asia

The maternal mortality ratio is universally used to track Millennium Development Goal 5 – to reduce maternal mortality. Maternal mortality has a special importance in the context of other maternal and child health outcomes. It is difficult to achieve sustainable development without maternal health. The WHO Regional Organisation guidelines “Beyond the numbers: reviewing maternal deaths and complications to make pregnancy safer” [11] describes the methods of the MDR. Countries of the South-East Asia Region have been implementing MDR using some combination of these methods to varying degree.

This study on the implementation of MDR was conducted in five countries in the region, namely India, Indonesia, Myanmar, Nepal and Laos. Each study was conducted with a specific aim and evaluated the level of MDR implementation and any factors for or against in the country. The studies were conducted in the region, and were country-specific, building on their experiences to move towards maternal health surveillance and response.

While the MDR was being implemented in each of the five countries, the team took note and the findings highlighted in this report. In general, these issues were recognized that the implementation of MDR was hindered by a range of barriers, both within and outside the health system. These barriers included, but were not limited to, the awareness of policymakers and members of the general public on the importance of MDR.

Study on the implementation of maternal death review in five countries in the South-East Asia Region of the World Health Organization

Dr Prasun Khetrapal Singh
Regional Director
World Health Organization, South-East Asia

*Ms. Prasun Khetrapal Singh*
Regional Director
World Health Organization, South-East Asia
Message from the Regional Director

MDGs to improve maternal health directly addresses the indicators of maternal mortality (a MMR of 210 in 2000). In 2010 it is estimated that more than 525,000 maternal deaths occurred. When compared with the MDG indicator of maternal mortality, it is clear that maternal health is an issue that needs to be addressed urgently and effectively.

The MDG indicator for maternal health is set at a MMR of 100 by 2015. This is a significant reduction from the 2000 figure of 430. If this target is achieved, it will represent a major step forward in the fight against maternal mortality.

The reduction in maternal mortality is directly linked to the achievement of the MDG targets for maternal health. By improving the health of women and children, we can help ensure that they have access to essential health services and information. This will result in a significant reduction in maternal mortality and improve the overall health of the population.

The MDG indicator for maternal health is measured by the MMR, which is defined as the number of maternal deaths per 100,000 live births. The target for maternal health under the MDG is set at a MMR of 100 by 2015. This is a significant reduction from the 2000 figure of 430.

The reduction in maternal mortality is directly linked to the achievement of the MDG targets for maternal health. By improving the health of women and children, we can help ensure that they have access to essential health services and information. This will result in a significant reduction in maternal mortality and improve the overall health of the population.
A study on the implementation of maternal death review in India
A study on the implementation of maternal death review in India
WHO Library Cataloguing-in-Publication data

World Health Organization, Regional Office for South-East Asia.

Maternal death review in selected countries of South-East Asia Region.


© World Health Organization 2014
All rights reserved

Requests for publications, or for permission to reproduce or translate WHO publications – whether for sale or for noncommercial distribution – can be obtained from SEARO Library, World Health Organization, Regional Office for South-East Asia, Indraprastha Estate, Mahatma Gandhi Marg, New Delhi 110 002, India (fax: +91 11 23370197; e-mail: searolibrary@who.int).

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers’ products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

This publication does not necessarily represent the decisions or policies of the World Health Organization.

Printed in India
# Table of Content

Abbreviations........................................................................................................ iv  
Executive Summary.................................................................................................. vii  
1 **Introduction** .................................................................................................... 1  
2 **Background** .................................................................................................... 2  
   2.1 Maternal death review – the methods ......................................................... 2  
   2.2 Maternal death review – experiences in other countries ....................... 2  
   2.3 Maternal death review in India – the historical perspective ............... 3  
3 **Objectives and methodology** ...................................................................... 4  
   3.1 Objectives .................................................................................................... 4  
   3.2 Methodology .............................................................................................. 4  
   3.3 Limitations of the study ............................................................................ 5  
4 **Findings** ........................................................................................................ 5  
   4.1 Overview of the maternal death review in India .................................. 5  
   4.2 Maternal and perinatal death inquiry response ...................................... 8  
   4.3 Facility- and community-based maternal death review – Tamil Nadu ..... 12  
   4.4 Confidential review of maternal deaths – Kerala .................................. 15  
   4.5 Hospital-based clinical case audits – Safdarjang Hospital, New Delhi ... 18  
5 **Discussion** ..................................................................................................... 20  
6 **Recommendations** ......................................................................................... 25  
   6.1 Scaling up maternal death review implementation in the states ......... 25  
   6.2 Monitoring and quality assurance of maternal death review ............. 26  
implementation  
7 **Conclusions** ................................................................................................. 26  
8 **References** ..................................................................................................... 27  

**Annexes**  
Annex 1. Questionnaire on status of maternal death review ......................... 29  
at different levels  
Annex 2. List of persons interviewed................................................................. 32  
Annex 3. Questionnaire for the Workshop on Implementation ....................... 35  
of Maternal Death Reviews in India, December 2010
## Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC</td>
<td>antenatal care</td>
</tr>
<tr>
<td>ANM</td>
<td>auxiliary nurse midwife</td>
</tr>
<tr>
<td>ASHA</td>
<td>Accredited Social Health Activist</td>
</tr>
<tr>
<td>AWW</td>
<td>anganwadi worker</td>
</tr>
<tr>
<td>BCC</td>
<td>behaviour change communication</td>
</tr>
<tr>
<td>BPHN</td>
<td>block-level public health nurses</td>
</tr>
<tr>
<td>BPL</td>
<td>below poverty line</td>
</tr>
<tr>
<td>CEMD</td>
<td>confidential enquiries into maternal deaths</td>
</tr>
<tr>
<td>CRMD</td>
<td>confidential review of maternal deaths</td>
</tr>
<tr>
<td>DHS</td>
<td>Director of Health Services</td>
</tr>
<tr>
<td>DLHS</td>
<td>District Level House Survey</td>
</tr>
<tr>
<td>EOC</td>
<td>emergency obstetric care</td>
</tr>
<tr>
<td>EONC</td>
<td>emergency obstetric and neonatal care</td>
</tr>
<tr>
<td>FBMDR</td>
<td>facility-based maternal death review</td>
</tr>
<tr>
<td>GOI</td>
<td>Government of India</td>
</tr>
<tr>
<td>HMIS</td>
<td>health management information system</td>
</tr>
<tr>
<td>IEC</td>
<td>information, education and communication</td>
</tr>
<tr>
<td>IPHS</td>
<td>India Public Health Standards</td>
</tr>
<tr>
<td>JSY</td>
<td>Janani Suraksha Yojana</td>
</tr>
<tr>
<td>KFOG</td>
<td>Kerala Federation of Obstetrics and Gynaecology</td>
</tr>
<tr>
<td>MAPEDIR</td>
<td>Maternal and Perinatal Death Inquiry Response</td>
</tr>
<tr>
<td>MCH</td>
<td>maternal and child health</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>MMR</td>
<td>maternal mortality ratio</td>
</tr>
<tr>
<td>NFHS</td>
<td>National Family Health Survey</td>
</tr>
<tr>
<td>NGO</td>
<td>nongovernmental organization</td>
</tr>
<tr>
<td>NRHM</td>
<td>National Rural Health Mission</td>
</tr>
<tr>
<td>PHC</td>
<td>primary health care</td>
</tr>
</tbody>
</table>
PHN  public health nurses
PIP  Project Implementation Plans
PPH  postpartum haemorrhage
PRI  Panchayati Raj Institution
RCH  reproductive and child health
SEARO  WHO South-East Asia Regional Office
UNICEF  United Nations Children’s Fund
WHO  World Health Organization
Executive summary

Accelerating progress towards Millennium Development Goals 4 and 5 in India is crucial for global success. Several efforts have been made to achieve this, including interventions under the Reproductive and Child Health (RCH) II programme of the National Rural Health Mission (NRHM). One of these interventions is to conduct Maternal Death Reviews (MDR), for which guidelines have been developed by the Government with assistance from the World Health Organization and other international partners.

**Objectives and methodologies:** The primary objective of this study was to review the progress and implementation of MDRs in India. The specific objectives were to (1) elicit information on implementation of MDRs; (2) document the experiences of the four specific MDR initiatives being implemented, including the follow-up actions; and (3) recommend steps for strengthening and institutionalizing MDRs in the country. To ascertain the overall situation in the country, a quick survey of stakeholders at different organizational levels was conducted, including state nodal points at a national workshop. Because the four MDR initiatives were known, they were specifically studied through a document review, field visits and observations, and interviews of stakeholders.

**Findings and discussion:** There is considerable variation in the implementation of MDRs among states. Of 28 states and union territories, only 6 completely fulfilled the criteria set. There are efforts by the Government of India through NRHM to encourage states to conduct MDRs. The four specific initiatives are functioning well; they have produced results that led to positive changes, although several challenges remain. The Maternal and Perinatal Death Inquiry Response funded by the United Nations Children’s Fund is a community-based verbal autopsy. In Tamil Nadu, a hospital-based MDR, supplemented by a community-based verbal autopsy, has been in place for more than 10 years. Confidentiality is a feature of the MDR in Kerala, started six years ago and running well. The clinical case reviews in Safdarjang Hospital were found to be relatively easy to conduct, but there was difficulty in getting coordination from various departments. These death reviews/audits have made several recommendations to improve maternal health and survival, and action has been taken based on these. The many policies and directive introduced to implement MDRs are commendable.

The disparity in implementation of MDRs between states and union territories is not surprising especially in a country the size of India. Likewise, it is not an unexpected finding that implementation is more pervasive in the more developed and literate states. The four specific MDR initiatives in India illustrate the mix of MDR methods. Because the number of maternal deaths in countries like India is relatively large, there is no real necessity to conduct near-miss audits. While medical causes of a maternal death can be seen from hospital reports, the socio-cultural circumstances can only be revealed from a verbal autopsy. The Tamil Nadu MDR, which combines facility-based reviews with community-based verbal autopsies, is fittingly the model recommended by NRHM.
There is a need to train health workers well, not only in the process of verbal autopsy, but also on clinical diagnosis. Confidential enquiry in Kerala incurs higher costs and tends to focus on medical factors, but the involvement of the private sector is laudable. Hospital-based MDRs as carried out in Safdarjang Hospital can be executed easily at low cost, the main difficulty being coordination between the various hospital departments. The policy to integrate the MDR within the national programme and the NRHM platform is apt. There are clearly strengths and opportunities, as well as weaknesses and threats to the successful implementation of MDRs.

**Conclusion and recommendations:** India has taken appropriate steps to institutionalize the MDR nationally through the NRHM. Lessons can be learnt from the various methods already implemented. Recommendations made by this study are in two broad categories:

1. To scale up MDRs in India, including advocacy in states, strengthen management and administration, earmark more funds, combine the MDR with other activities under RCH II, and develop and disseminate guidelines; and

2. To institutionalize a monitoring mechanism for MDR, which includes designating a nodal person at state level, improving the information and data collection system, providing regular feedback, and putting in place a quality assurance system.
1. Introduction

India has the most number of maternal deaths in the world and ranks highest among the 10 lowest performing countries. According to recent estimates, about 358 000 maternal deaths occur globally each year, of which 75 000–150 000 take place in India. Approximately 80% of maternal deaths worldwide are due to haemorrhage, sepsis, unsafe abortion, hypertensive disorder of pregnancy, and obstructed labour. These deaths can be avoided with key health interventions like provision of good antenatal care (ANC), skilled birth attendance and emergency obstetric care (EOC). There is a wide variation in maternal deaths within the states of India. For example, central and eastern states, namely Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand and Orissa contributed to over half (55%) of the maternal deaths during 2004–2006. On the other hand, most western and southern states, e.g. Maharashtra, Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu and Kerala account for only 17% of maternal deaths. Studies have also shown a negative association between the use of maternal care and the maternal mortality ratio (MMR).

Several strategies and interventions have been implemented to reduce MMR and to achieve Millennium Development Goal (MDG) 5. These include the Janani Suraksha Yojana (JSY), which has contributed to increased institutional deliveries, improved referral and timely access to EOC.

One of the primary requirements for planning and monitoring programmes and interventions is to know the magnitude of the problem, as in monitoring the MMR and its trend. But just monitoring MMR is not adequate to understand the problem. The causes and circumstances surrounding maternal deaths need to be reviewed. A Maternal Death Review (MDR), also called Maternal Death Audit, is required. The MDR is a systematic method of reviewing maternal deaths not only to confirm the cause of death but also to outline the underlying social, institutional and programmatic contributing factors. The lessons learnt influence recommendations and remedial actions to be instituted to prevent future maternal deaths. An MDR also empowers the local authorities to improve maternal health services. Hence, it is crucial that they are conducted properly and that all maternal deaths are audited to generate evidence to determine interventions as well as to provide information for the National Registration System for monitoring MMR and trends.

The status of MDR in India as reported at the Regional Workshop on Strengthening Capacity for Facility-based Maternal Death Reviews held in 2007 is as follows:

“The methods practised in different areas of India vary. These include facility-based and community-based verbal autopsies, and confidential enquiry (in Kerala). Examples were presented from different settings and reflect how various methods helped to identify the gaps and lead to local immediate efforts to address those gaps.”
2. Background

2.1 Maternal death review – the methods

As outlined in the guide *Beyond the numbers – reviewing maternal deaths and complications to make pregnancy safer* (WHO, 2004), the five methods of MDR are:

- Community-based maternal death reviews (verbal autopsies)
- Facility-based maternal death reviews
- Confidential enquiries into maternal deaths (CEMD)
- Surveys of severe morbidity (near-miss reviews)
- Clinical audits.

This study briefly reviews some of these methods being implemented in India and describes the success and limitations of their implementation.

2.2 Maternal death review – experiences in other countries

In the 1920s and 1930s high maternal mortality became a public concern in some European countries (particularly the United Kingdom), the United States of America, Australia and New Zealand. Health-care providers were focusing mainly on improving care and skills of birth attendants and the place of delivery, whereas many other contributory factors, socioeconomic status and access to health care were not looked into.

The earliest system of CEMD was instituted in the United Kingdom in the 1920s. Based on health indicators, no change was observed in the number of maternal deaths over the years. A small-scale case review of the cause of maternal deaths was initiated which evolved into a larger review in 1935. With the provision of free health services in the 1940s a sharp decrease in maternal deaths (from 400 in 1935 to 11 in 1999) was observed. This decline was attributed to use of aseptic techniques during delivery, antibiotics for puerperal infections and ergot injections and blood transfusion to control postpartum haemorrhage (PPH). CEMDs are now carried out routinely in many countries like Australia, Indonesia, Israel, Malaysia and South Africa.

Facility-based maternal death reviews (FBMDR) have also been in practice in many countries to varying degrees. Its history can be traced to some well-known reviews in the literature [Uganda in 1952–1959, Malawi in 1977 and north Yemen during 1989–1991 to mention just a few]. Clinical audits, though initiated in the United Kingdom in 1989 to promote better services, have been followed in India at some institutions like Christian Medical College, Vellore and Gosha Woman’s Hospital, Chennai. Recommendations from such audits were used to institute remedial actions (e.g. better access to blood transfusion and specialized care in case of PPH etc.)
2.3 Maternal death review in India – the historical perspective

One of the earliest references to studying maternal mortality in India is given by the Government’s Health Survey and Development Committee report, known as the Report of the Bhore Committee [1946]. After reviewing the available evidence, the Committee came to the conclusion that the MMR in the country was around 2 000 deaths per 100 000 live births. The Mudaliar Committee in 1959 estimated that the MMR had decreased to 1000. The main cause for the decline was thought to be due to the decrease in the incidence of malaria, which was associated with high mortality. The first community-based study on maternal mortality was conducted in Ananthapur district of Andhra Pradesh in 1984–1985 that gave an estimate of MMR as 798. Subsequently in 1992, results from a nationwide sample study undertaken by the Indian Institute of Population Studies estimated MMR to be 437; estimates from the National Sample Surveys and the Sample Registration System showed that maternal mortality declined from 1300 deaths per 100 000 live births in 1957 to 301 in 2003.

In India, except for some institutions where maternal death audits were being conducted, there has been very little progress in institutionalizing MDRs on a national scale. Although the safe motherhood initiative was included in 1992 in the child survival and safe motherhood programme (1992–1996), MDR was only mentioned in RCH Phase I (1997–2004), which resulted in the states of Tamil Nadu and Kerala collecting data on maternal deaths, but no action was taken on this information. MDR was subsequently included in RCH Phase II (2005–2012), which also emphasizes creating demand for quality care and greater community participation. The India Public Health Standards (IPHS), which define the services to be provided under NRHM, was revised in 2010. Detailed guidelines (including formats) for conducting FBMDR were included in the revision. This has facilitated more states to include FBMDR in the state Project Implementation Plans (PIP).

In 2003–2004, the World Health Organization (WHO) Regional Office for South-East Asia (SEARO) with the WHO India Office conducted a pilot study in New Delhi on adapting and testing the WHO FBMDR tool. Out of the eight hospitals enrolled initially, only Safdarjang Hospital completed the study. The United Nations Children’s Fund (UNICEF) India in 2004–2005 instituted the Maternal and Perinatal Death Inquiry Response (MAPEDIR) – a community-based MDR – in 16 districts of 6 states of India.

Building on the pilot at Safdarjang Hospital, the Ministry of Health & Family Welfare with support from WHO India in 2003 established a core group for developing the standardized protocols and operational guidelines for FBMDR and developed tools for implementation of facility- and community-based MDR, which were disseminated to the states in following years. However implementation was suboptimal and uneven, due to lack of clarity. Operational guidelines were then revised and another dissemination workshop held in 2010. WHO, along with other United Nations agencies, have been supporting the Government of India (GOI) over the last few years to strengthen the roll-out of the MDR through workshops, development of tools and conducting training at various levels. Although many states have budgeted for MDR in their plans, the activities remain largely fragmented and generally limited to
3. Objectives and methodology

3.1 Objectives

The primary objective of this study was to review the progress and implementation of MDRs in India, to document the process, identify key challenges and draw lessons from the MDR experience in India. The secondary objectives were:

i) to elicit basic information on the implementation of MDR in the states

ii) to document the experiences of the four specific MDR initiatives being implemented, including the follow-up actions undertaken based on the findings of the MDR

iii) to recommend steps for strengthening and institutionalizing MDR in the country with dissemination of lessons learnt.

3.2 Methodology

Sampling

To determine the overall status of MDR implementation in the country, a quick survey was conducted for stakeholders in all states. In December 2010, a national training workshop was convened by NRHM, and this was an opportunity to interview nodal officers from the states.

Because it is known that MDRs are conducted as specific initiatives – the four principal MDRs described in this study – the sampling is inevitably purposive. These initiatives and the sampled areas for this study are shown in Table 1 below.

<table>
<thead>
<tr>
<th>MDR initiative</th>
<th>Sample sites studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community-based maternal and perinatal death review by verbal autopsy conducted by UNICEF in 9 states and 42 districts</td>
<td>Bhopal and Guna districts in Madhya Pradesh</td>
</tr>
<tr>
<td>Facility-based maternal death reviews supplemented by community verbal autopsy in Tamil Nadu</td>
<td>Chennai and Vellore districts</td>
</tr>
<tr>
<td>Confidential review of maternal deaths in Kerala since 2005</td>
<td>Trivandrum district and Thrissur city</td>
</tr>
<tr>
<td>Hospital-based maternal death reviews using clinical case audit</td>
<td>Safdarjang Hospital, New Delhi</td>
</tr>
</tbody>
</table>
Tools and data collection

For the study on the overall situation in the states, a 2-page questionnaire (Annex 1) was distributed to officer-in-state health authorities for perception and opinion of health providers, government functionaries at various levels and categories, and of international agencies (Annex 2). During a training workshop in December 2010 convened by NRHM, a further questionnaire was distributed to state nodal officers (Annex 3).

Data from District Level House Surveys (DLHS 3), the Census of India 2001, National Family Health Surveys (NFHS 3), as well as from registers and records at facilities, public hospitals and health centres were also included in this study. The report of an MDR national workshop in 2009 was reviewed.

For the four specific MDR initiatives, field visits were made to the sample sites listed above, where various methods were used to gather information: document and literature reviews, in-depth interviews of stakeholders in person or by telephone, group observations, question-and-answer sessions; and perceptions of relatives of women who had died.

3.3 Limitations of the study

The small and purposive sample was a limitation as MDR is known to be implemented and well documented only in a few states and districts. Since other states may be conducting MDRs it is possible that isolated institutions were missed in the data collection. However, during the visits and interaction with the nodal persons, efforts were taken to minimize this bias. Another limitation was the poor documentation of MDRs and follow-up action, which was noticed in many places, especially in a few institutions visited. This has limited, to a certain extent, the completeness of data collection.

4. Findings

The findings below are organized in five parts: the first describes the overall situation in the country followed by four parts to describe each of the four specific MDR initiatives.

4.1 Overview of the maternal death review in India

Evolution

It was expected that an MDR was being implemented to some extent in the states, in view of the past initiatives, especially the directive from the NRHM and the technical support provided by WHO in 2003. At a national workshop on MDR in 2009, an attempt was made to document and share experiences from districts and facilities that had started MDR. Some of the outputs from this were:

- A core committee was established to develop tools and guidelines for MDR.
These were finalized and disseminated to all the states in March 2010.

- The states were sensitized on developing and instituting an action plan for both community- and facility-based MDRs. It was anticipated that the state governments would include MDRs in the State PIPs of NRHM. Most states have included MDR but some proposed to include this in the 2011–2012 plan for which funds were earmarked by the central Government.

- It was recommended that MDRs be institutionalized at all first referral units.

**Current status**

Building on these developments, the current study attempted to examine the overall situation. The quick survey sent to the state health authorities and other stakeholders, and the questionnaire to the state nodal officers at the national workshop in December 2010, asked questions related to the following issues:

- institutionalizing MDR (whether a government order was issued, state and district nodal officers identified, state and district committees established)

- allocation of funds (whether the nodal officer was identified and whether state and district committees were formed)

- the process used to conduct MDRs (whether MDRs were done for all cases, whether the records and registers were revised and whether regular reviews and feedback were given at various levels)

- the training status at the state and district level.

Of the 28 states and union territories, only 6 have successfully institutionalized MDR; 10 have partially fulfilled the criteria; and 13 have yet to begin the process (Figure 1).

**Figure 1. Implementation of maternal death reviews in the states of India (as of 10 December 2010)**

- **States & UTs (n=28)**
  - Completely instituted
  - Partially instituted
  - Not instituted

*Mizoram, Nagaland, Andaman & Nicobar, Arunachal Pradesh, Sikkim and National Capital Territory of Delhi not represented.

**Category 1**: (Completely instituted at the state/district/major government institutions) – Tamil Nadu, Kerala (public and private hospitals), Gujarat, Karnataka, Rajasthan and Maharashtra.

**Category 2**: (Partially instituted) – Goa, Jammu and Kashmir, Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, West Bengal, Haryana, Punjab and Himachal Pradesh.

**Category 3**: (Not instituted) – Tripura, Meghalaya, Assam, Manipur, Lakshadweep, Uttar Pradesh, Uttarakhand, Orissa, Andhra Pradesh, Chandigarh, Dadra and Nagar Haveli, Puducherry, Daman and Diu.
**Challenges**

Some of the constraints expressed by the state nodal officers in implementing the MDR were:

- Poor reporting of maternal deaths, especially in the urban areas, private sector and migrant population. Moreover, maternal deaths during early pregnancy and due to abortions are not being reported.

- Staff vacancies (especially of accredited social health activists (ASHA) and auxiliary nurse midwives (ANM) who are required for an MDR).

- Social and political constraints: due to fear of punitive action and repercussion from the community there is reluctance from health functionaries to conduct MDRs. Moreover, there is no proper information, education and communication (IEC) or behaviour change communication (BCC) for community advocacy.

- Lack of ownership of the programme by the states and districts (NRHM and district magistrates).

- Poor supervision at district and block level.

- Lack of training and resource persons.

- Difficult terrain, lack of specialists and poor referral system especially in the high-burden districts.

**Recommendations**

Some suggestions made by the state nodal officers for strengthening MDR were as follows:

- Infrastructure at the health facilities needs to be improved as per IPHS. In particular, blood storage units need to be established at all first referral units.

- Technical support is needed at the state/district levels for data analysis. A proper feedback mechanism of the recommendations must be instituted in order that the concerned facility may make the necessary action.

- Community-level cooperation is required for data collection and sharing of experiences without suspicion and blame. IEC and BCC strategies to be instituted for the same. There is also a need to develop a system for protection of health functionaries against legal action.

- State, district and community functionaries should be sensitized for smooth implementation of the programme. Training of health staff at all levels needs to be addressed. The MDR needs to be introduced into the curriculum, both for in-service and pre-service education.

- Filling of vacancies of staff, regular or contractual, at all levels is crucial for the programme.
The MDR is to be incorporated into the existing NRHM programmes. Constant flexible fund flow must be assured for this programme with a sustained commitment from the authorities. Mobility support to be provided in hard-to-reach areas for conducting investigations.

A standard format to monitor indicators should be made available at the state/district level for the programme. The Managing Director or Executive Director of NRHM at the state level and the district collectors should assure programme monitoring.

4.2 Maternal and perinatal death inquiry response

Evolution

Piloted in Purulia district of West Bengal in June 2005, MAPEDIR is currently implemented in 42 districts in 9 Indian states with high maternal mortality. MAPEDIR has brought greater awareness about the factors leading to maternal deaths as well as the relevance of birth-preparedness and complication-readiness. It has helped communities to increase demand and improve access to health-care delivery services. For instance, in Dholpur district in Rajasthan, MAPEDIR has resulted in establishment of a community-based transport system for mothers to promote institutional delivery. At the institutional level, the MAPEDIR process has strengthened coordination and partnerships between government agencies, civil society, academia and development partners.

The MAPEDIR project has gone through three phases of implementation as below:

Phase I  Initiation during 2005–2007 (16 districts)
Phase II  Scale-up during 2007–2008 (40 districts)
Phase III  Partnership with the states by developing tools and incorporating community-based and facility-based MDR during 2008–2009 (11 districts).

Approach and process

MAPEDIR is a community-based inquiry tool to examine maternal deaths. Medical records capture only the immediate, clinical causes of maternal deaths. The MAPEDIR process includes personal, family, socio-cultural, economic and environmental factors contributing to maternal deaths to provide information both to the communities and health officials to take remedial actions. The data gathered are aggregated, periodically analysed and reported back to the district health workers. MAPEDIR aims to increase community participation and awareness of maternal mortality. The tool has improved reporting of maternal deaths especially in states with weak health-care systems and infrastructure.

MAPEDIR is implemented at the block and district levels (Figure 2). Community-based health-care personnel – public health nurses (PHN), block-level public health nurses (BPHN), ANM, ASHA and anganwadi workers (AWW) – are key to the project. They act as death notifiers. A death notifier initially investigates community reports
of deaths of women of reproductive age and sends his/her findings to the block-level MAPEDIR team supervisor, who is usually the Block Medical Officer. S/he assesses each report and assigns the suspected maternal death for a MAPEDIR interview. A two-member team of a trained BPHN or PHN with another health-care staff or Integrated Child Development Services (ICDS) supervisor complete the MAPEDIR interview and records in a MAPEDIR format. One of the team performs the role of the interviewer while the other acts as rapporteur. Death reports are completed and MAPEDIR interviews compiled and analysed at the district level with technical assistance from UNICEF, and the interview findings are shared with the community through the district and block officials and nongovernmental organization (NGO) partners. Technical support is provided by UNICEF for MAPEDIR in Madhya Pradesh through a state officer and district and block consultants in the districts of Guna, Shivpuri and Gwalior.

**Figure 2. The MAPEDIR process**
Current status

Currently UNICEF is working in 42 districts in 9 states and has investigated over 3046 maternal deaths. Initially in 16 districts, the programme has now expanded to 42 districts. It is project-driven and depends on external funds.

Table 2. Status of implementation of MAPEDIR (2010)

<table>
<thead>
<tr>
<th>State</th>
<th>District</th>
<th>Initiated</th>
<th>Deaths investigated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orissa</td>
<td>8+7 (2010)</td>
<td>Sept 2007</td>
<td>1934</td>
</tr>
<tr>
<td>West Bengal</td>
<td>6</td>
<td>May 2005</td>
<td>390</td>
</tr>
<tr>
<td>Jharkhand</td>
<td>7</td>
<td>Jan 2006</td>
<td>213</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>9+3</td>
<td>May 2008</td>
<td>100</td>
</tr>
<tr>
<td>Assam</td>
<td>2</td>
<td>Sept 2008</td>
<td>11</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>2</td>
<td>April 2005</td>
<td>122</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>2</td>
<td>April 2007</td>
<td>40</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>2</td>
<td>Feb 2006</td>
<td>116 only Guna (2010)</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td></td>
<td>2930+116 (Guna)</td>
</tr>
</tbody>
</table>

Key findings of the maternal death profile from MAPEDIR review

- Most maternal deaths take place in the postpartum period with the majority on the first postpartum day.
- Bleeding is the most common cause of death followed by eclampsia.
- Most women who died belonged to scheduled castes/tribes and were illiterate.
- Family members of most women who died were not aware of below poverty line (BPL) entitlement regarding medical care.
- Women have a very small role in deciding to seek health care. Hence the involvement of the husband is critical in the decision-making process.

Recommendations as a result of MAPEDIR

The recommendations made by the audit teams for MAPEDIR can be categorized according to the “three delays” – deciding to seek care by increasing awareness, ability to avail of transport by reducing barriers, and ensuring the provision of the care sought, especially in making skilled birth attendance and EOC available.

i) Address awareness to seek care – strengthen birth planning activities under JSY and pregnancy tracking mechanism.

ii) Address constraints in seeking care referral
   - Cash to be paid immediately at the time of delivery
   - All women to be included under JSY scheme, regardless of their BPL status
– Out-of-pocket expenses at the facilities need to be reduced to a minimum
– Alternative transport arrangements through public–private partnerships like the Janani Express need to be expanded throughout the state.

iii) Address skilled birth attendance and emergency obstetric and neonatal care (EONC)
– Focus on operationalization of basic EONC
– Blood transfusion facility to be provided as per stated norms
– Strengthen post-natal and early newborn care
– Hospitals and health centres should be adequately equipped to conduct deliveries
– Skilled birth attendants to be trained and adequate staff available at all times.

Examples of initiatives taken by the community after introduction of MAPEDIR

Some notable initiatives taken up resulting from MAPEDIR are shown below.

• **In Purulia, West Bengal**, preliminary findings from the MAPEDIR process persuaded the Government of West Bengal to consider expanding the coverage of government-aided schemes such as JSY to cover above- and below poverty line women, and to include those in urban areas as well. MAPEDIR is recognized and a part of the official policy of the West Bengal Government. Once aware of the needs of an MDR, the village Panchayat came up with a community-based emergency referral transport system by means of a van rickshaw in Purulia. West Bengal has instituted a policy of free maternity beds and a voucher-based referral transport system.

• **In Udaipur, Rajasthan**, the district health administration incorporated MAPEDIR as one of its activities and is a part of the review meetings. As of July 2007, the district administration has carried out verbal autopsies of maternal deaths in four blocks of Udaipur district with the assistance of NGOs such as Action Research and Training in Health (ARTH). One outcome of the MDR is that in Dholpur, village-level transporters are taking an active part to save lives. Also an obstetric helpline has been initiated to connect remote areas.

• **In Madhya Pradesh**, as a result of the MAPEDIR process the gram panchayats of Guna and Shivpuri have adopted MDRs in each village since January 2007. The MAPEDIR process also resulted in the following initiatives: 22 referral transport vehicles known as the ‘Janani Express’ are available at all times, instituted within the government system; 16 institutions are operational to conduct deliveries and handle obstetric emergencies (in Guna block); and village councils now hold meetings to discuss the findings of MDRs, developing interventions such as the community-based emergency referral transport system. Such local action has kept the emergency transport systems operational despite civil unrest and crisis situations, saving the lives of many women who would not have made it to a health facility. The observations of the MAPEDIR have been acknowledged and the RCH
The state PIP is developed along these lines. There is a revitalization of remote primary health care (PHC) centres and sub-centres in high mortality border areas where the majority of maternal deaths occur.

- **In the eight districts of Navjyoti in Orissa** steps are being taken by the Government to see that blood banks and blood storage units are available at the appropriate centres.

*Adapted from the MAPEDIR book and presentations*

**Challenges**

The main challenge is that MAPEDIR is being implemented as a project. There is a need for a transition plan for states to incorporate MAPEDIR into the FBMDR being rolled out under NRHM.

4.3 **Facility- and community-based maternal death reviews – Tamil Nadu**

**Evolution**

Tamil Nadu is one of the better performing states in the country in terms of health indicators, largely due to its history of social reforms and interventions. The MMR in Tamil Nadu has reduced by over 80% since 1980. The infant mortality rate has also fallen significantly from 113/1000 live births in 1971 and 59 in 1990 to 37/1000 in 2006. The percentage of deliveries taking place in institutions has risen from 67% in 1993–1994 to 98% in 2007–2008.

Tamil Nadu is divided into 31 revenue districts. These are sub-divided into 206 talukas, spread over 385 development blocks. In each revenue district, a district collector oversees all activities – revenue, development, law and order. Health administration in the state is organized through 42 Health Unit Districts, each of which is under the charge of a Deputy Director of Health Services, while health administration at the level of the revenue district is the responsibility of a Joint Director of Health Service.

Three vital factors have made pregnancy safer in this changing socio-political climate (i) a long history of social reforms; (ii) steady progress in the importance of gender equality; and (iii) political commitment to women-centred policies.

Maternal death audits, instituted in the state since 2000, have succeeded in identifying many system failures and disparities, which in turn triggered policy initiatives. These audits highlighted the reasons for the various delays in seeking care – maldistribution of first referral units, missed opportunities at the institutions, multiple referrals and poor accountability and monitoring of the health service providers. The initiatives taken by the state to address these issues include provision of comprehensive EONC by mobilization of specialists.
**The process**

All maternal deaths are reported within 24 hours directly to the Commissioner of Maternal Child Health and Family Welfare by the field health and AWWs, community nurses, medical officers and hospitals. Upon receipt of the report, a district level investigation team in every district, following interviews of the deceased’s relatives and health-care staff, reviews records at the health facility or facilities where the woman received care. A detailed medical report is submitted by an obstetrician within 15 days of the maternal death, the findings are reported to the health staff in that facility, and reviewed at the district level monthly and annually. Random cases are selected for monthly review at the state level. Investigations are carried out through community- and facility based MDRs. The reviews are placed on a monthly basis before the medical death audit committee chaired by the district collector who issues orders for immediate corrective actions. Maternal deaths reported increased from 640 in 1995 to 1600 in 2001 followed by a decline. Shortage of staff, delay in transportation, multiple inter-institutional referrals, and designated facilities not providing EOC were the most common constraints noted in the audits. These gaps are however being addressed to improve provision of services and promote accountability in the health system. The audits have also provided valuable lessons to strengthen management and governance for health managers at all levels. The line of reporting is depicted in Figure 3 below.

**Figure 3. Line of reporting of maternal deaths audits in Tamil Nadu**
Findings

Some observations and actions taken by the Government of Tamil Nadu as a result of the MDR, especially to reduce the three delays, are:

i) Awareness on seeking care:
   - Lack of community awareness of danger signs: concept of birth companion introduced.

ii) Transportation and referral
   - Unnecessary referrals: streamlining of referral procedure
   - Lack of emergency transport facility: free ambulance service with call centres.

iii) Skilled birth care and EONC
   - Maldistribution and shortage of specialists at the first referral unit
   - Comprehensive EONC centres not functioning due to lack of staff
   - Lack of skills of doctors in emergency obstetrics, anaesthesia and ultrasonography
   - Substandard care in institutions and poor accountability of service providers
   - Lack of staff motivation; the districts were ranked every month based on PHC delivery performance along with recognition and appreciation of the staff for the good work by the elected leaders and public.

Challenges

- Private sector health-care providers not included under MDR implementation
- Civil society organizations not involved in MDRs
- Fear of punitive action among health-care providers may lead to under-reporting of maternal deaths.

Actions taken by the Tamil Nadu Government

As a result of the MDR, some actions have been taken by the state government. These include:

- ensuring a 21 hour/7 days a week service in all PHC centres by providing staff to work in shifts;
- sending daily information on deliveries and maternal and newborn deaths from all public health facilities to the project Director of RCH and Commissioner for Maternal and Child Health (MCH);
- regular training of anaesthetists and obstetricians;
• sourcing services from private specialists who are paid an honorarium;
• establishing comprehensive EOC centres (at least three in each district with trained staff);
• introducing a “birth companion” programme;
• providing more ambulances for better and easier referral;
• establishing blood bank/storage services in 81 centres; and
• encouraging community participation.

There have also been better linkages between government departments, with better administrative coordination. Funds were mobilized through partnership with local, national and international donors.

Impact of maternal death reviews in Tamil Nadu

While improvements are the result of several initiatives and activities, and not attributed to MDR alone, it has to be recognized that implementation of actions following the MDR resulted in a dramatic reduction in maternal deaths and improvement in child health. The MMR for Tamil Nadu has decreased steadily from 380/100 000 in 1993 to 90 in 2007 because of focused interventions for the various direct and indirect causes of death. Although overall the number of maternal deaths reduced, those due to PPH – which is still the most common cause of death – reduced slightly from 30% in 2006 to 25.6% in 2008 (interventions taken were training of nurses in active management of third stage of labour, and blood being readily available and easily accessible). Other causes like pregnancy-induced hypertension, obstructed labour, postpartum sepsis and septic abortions, in spite of targeted interventions, showed no significant change. Deaths due to anaemia have reduced from 5.4% to 4.5% due to readily accessible and available blood and intravenous iron therapy. Table 3 compares the deaths in 2006 and 2008 from various causes and the impact of interventions so far implemented by the state government.

Table 3. Proportion of maternal deaths by cause in Tamil Nadu, 2006 and 2008

<table>
<thead>
<tr>
<th>Cause</th>
<th>2006 (%)</th>
<th>2008 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postpartum haemorrhage</td>
<td>30.0</td>
<td>25.4</td>
</tr>
<tr>
<td>Pregnancy-induced hypertension</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Postpartum sepsis</td>
<td>3.5</td>
<td>3.2</td>
</tr>
<tr>
<td>Septic abortion</td>
<td>3.5</td>
<td>3.2</td>
</tr>
<tr>
<td>Anaemia in pregnancy</td>
<td>5.4</td>
<td>4.5</td>
</tr>
</tbody>
</table>

4.4 Confidential review of maternal deaths – Kerala

Evolution

In Kerala, like in Tamil Nadu, there has been strong political will and commitment for more than 30 years. Because of high literacy rates people are aware of their rights. As
a result, to avoid public censure, doctors readily refer patients. Transportation services, although available, have just undergone expansion with 108 new ambulances. The sub-centres and PHC centres do not conduct deliveries because of the increased awareness of the population and the availability of specialists. Thus only ANC is provided at these levels. Women prefer to deliver in MCH centres, taluk hospitals, district hospitals, medical colleges or private hospitals as specialists are available there. Due to the demand from the public, strict monitoring and supervision of staff is done at all levels on absenteeism, attitude, and provision of services.

It was felt that Kerala, with its high rate of literacy, good transportation system and health awareness could definitely bring down its MMR if the causes of maternal deaths were investigated and actions implemented to prevent them. Confidential enquiries and reviews of maternal deaths were initiated in Kerala in 2003. Following a pilot study of the various methods of MDR, it was decided that the system of CEMD followed in the United Kingdom would be the most appropriate option for the state. With technical support from WHO, the United Kingdom and Dr Hugh Philpot from South Africa, a meeting was convened in December 2003 to help establish such a system and thus the Confidential Review of Maternal Deaths (CRMD) was initiated.

The Kerala Federation of Obstetrics and Gynaecology (KFOG), formed in 2002, came forward to assist in initiating this process. The unique features of CRMD are that the assessment is done by an obstetrician, confidentiality is maintained, there is legal immunity, and anonymity is ensured. So the process became a fact-finding, rather than a fault-finding one.

**The process**

Although the responsibility of implementing the CRMD lies with the Director of Health Services (DHS) and the State RCH Officer, responsibility to conduct it lies with the State CRMD Coordinator identified by KFOG (usually the Chairman of KFOG). A similar structure is also followed in the districts. When a death occurs, the District Medical Officer is informed immediately, who then swiftly informs both the State DHS and the State CRMD coordinator (through a set of reporting forms – Form A and B). The reporting forms are then coded, blinded, and passed on to the district CRMD who is responsible for case investigation through an independent group of assessors (supported by KFOG). A detailed report is sent within seven days to the state DHS and State CRMD coordinator.

The CRMD consists of a state coordinator/Chairman of KFOG, 11 district coordinators and 4 zonal coordinators to assist in the investigations and reporting. To further analyse the deaths and for better coordination, two levels of committees have been established: an Executive Committee which consists of 13 members (DHS, State RCH officer, all zonal coordinators, senior Medical College professors, etc.) chaired by the State Coordinator of CRMD; and a second committee comprising a larger group of general assessors from obstetrics and gynaecology and other specialties to aid in the review of complicated cases. After an initial detailed review by the general assessors of all cases, they are then compiled and forwarded to the Executive Committee, which convenes on a quarterly basis. Their conclusions and recommendations are
then forwarded both to the state government and the institutions for follow-up. The line of reporting is depicted in Figure 4.

**Figure 4. Line of reporting of maternal death audits in Kerala**

![Diagram](image)

**Findings**

- In terms of causes of maternal deaths, the most common were PPH (20%) followed by pregnancy-induced hypertension (13%), amniotic fluid embolism (10%), heart disease (9%) and thrombo-embolism (6%).

- The referral system needs improvement, e.g. ambulances are not available and first aid obstetric care is not administered before or during transfer of patients, such as packing for traumatic PPH.

- In terms of skilled care and EONC, protocol-based management is not practised, e.g. magnesium sulphate for eclampsia; EONC facilities are lacking even at higher centres; there is also a lack of specialist doctors and intensive care facilities in higher centres; the skills of the doctors are not adequate, many of whom do not go for continuing medical education.
**Recommendations**

- The Health Secretary should be present at annual meetings to review the findings and act on recommendations.
- There should be a mechanism in place to disseminate information gathered by the CRMD to practising obstetricians and ensure compliance.
- For sustainability and continuity, the KFOG should be considered the best agency to conduct the CRMD as 70–80% of deliveries take place in private hospitals.
- The Government should issue clear orders on reporting and auditing maternal deaths. Public–private partnerships are needed and the Government of Kerala needs to take the lead.
- A clear Government order is needed to make maternal death audits mandatory.

**Actions taken**

From the findings and recommendations of the CRMD, some actions have been taken.

- A fraction of the funds have been allotted to printing the review of the CRMD, for protocols and for review meetings so far, but more funds are required for proper functioning of the civil body.
- The service of 25 ambulances has been instituted in Trivandrum district and it is proposed to scale this up.
- Strict vigilance on performance of PHC centres, community health centres and taluk hospital staff to see if an optimal standard of care is maintained for delivery of services at all levels and that specialists are available at all times.

**Challenges**

The main limitations of confidential enquiries are their cost, the tendency to focus only on medical factors and the lack of systematic monitoring of uptake of recommendations.

**4.5 Hospital-based clinical case audits: Safdarjang Hospital, New Delhi**

**Evolution**

In 2003–2004, SEARO conducted a pilot study on institutional-based clinical audits in New Delhi. Although nine hospitals were enrolled — Safdarjang, Guru Tegh Bahadur, Bara Hindu Rao, Lok Nayak Jai Prakash, Dr Babasaheb Ambedkar, Kasturba, Sanjay
Gandhi Memorial, Maulana Azad Medical College, Babu Jagjivan Ram Memorial – only Safdarjang Hospital took part in the study.

Some institutions like Maulana Azad Medical College and Sanjay Gandhi Memorial Hospital have been maintaining their own maternal death records since the year 2000 and conduct their own case audits. Safdarjang Hospital is a large tertiary care institution with a 300-bed Obstetrics-Gynaecology Department. The department provides both basic and referral services not only for New Delhi but also for adjoining states like Haryana, Uttar Pradesh and Rajasthan. An average 20,000 deliveries are conducted annually. FBMDRs at Safdarjang Hospital were first initiated in 2003 as a part of a WHO study in which maternal deaths were analysed from 1 July 2003 to 30 June 2004, and have been carried out ever since.

The process and findings

The FBMDR questionnaire used for the clinical audit was based on the WHO guide *Beyond the numbers* in the study.

In terms of findings from these reviews, the following were observed/documentated:

- **Antenatal care** – 56% of referred patients had no ANC; almost 12% of deaths were associated with unsafe abortions indicating a need to strengthen safe abortion services.

- **Referral care** – Contributing factors related to transportation: most patients reach the institution by private transport with no life-care support or an identified ambulance service.

- **Provision of skilled birth attendance and EONC** – In 15% of referred patients, delivery was conducted by unskilled birth attendants, indicating the need to promote institutional deliveries; other issues for action are non-availability or delay in provision of blood for transfusion, inappropriate treatment and poor management of post-operative patients by private hospitals and referring doctors.

Action taken by the institution

- Strengthened monitoring of post-delivery and post-operative cases.
- Advocacy at institutional level for better infrastructure.
- Better intra/inter-departmental coordination.
- Development of protocols and standard operating procedures for clinical management and procedures.
- Ensured availability of blood 24x7.
- Networked for better referral care from the catchment areas.
Challenges

- Following termination of the project, regular follow-up and inter-departmental coordination declined.
- The Chief Medical Officer is not part of the MDR so recommendations on infrastructure, development of protocols and inter-departmental coordination may be difficult to implement.

5. Discussion

India has taken positive steps to institutionalize the process of MDR by including it as one of the strategies under the NRHM since 2009. States were encouraged to include MDRs in their PIPs. Several policies, directives and activities have been introduced to ensure that this process is implemented. The disparity in MDR implementation among states and union territories is not unusual or unexpected in a nationwide policy, especially in a country the size of India, with complexities of demography, culture and socio-economy. Likewise it is not a surprising finding that five of the six states that completely fulfilled the criteria – Kerala, Tamil Nadu, Maharashtra, Karnataka, Gujarat – are the more developed and literate among Indian states, where efforts related to MCH are well in place, and the MMR is relatively low. Rajasthan also fulfilled all criteria but is not among the more developed states and can therefore be seen as an anomaly. Reasons for this need to be explored.

Along the same lines, the nine states that partially met the criteria include the more advanced states of Punjab, Goa, Haryana, West Bengal and Jammu and Kashmir. It is encouraging to see some “less developed” states with high maternal mortality – Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh – also in this category. Tripura, Meghalaya, Assam, Manipur, Uttar Pradesh, Uttarakhand, Orissa, and Andhra Pradesh are some of the states that did not meet any of the criteria for an institutionalized MDR, and efforts should be made to encourage and support them to do so.

The four specific MDR initiatives in India that were reviewed in this study illustrate very well the mix of main methods used – the community-based MDR employed by UNICEF (MAPEDIR); the CRMD (Kerala); hospital-based MDR (Safdarjang Hospital, New Delhi) and a combination of facility and community MDR which is being followed in Tamil Nadu. Although the findings did not focus or specifically mention maternal near-misses or severe morbidity, it was likely that this was adopted.

The UNICEF-led MAPEDIR in nine states also incorporated perinatal death audits, which is an approach especially used in countries where the number of maternal deaths is small. In countries such as Malaysia, a perinatal death audit (which is done on a sample) is a separate activity to a maternal death audit (which audits all deaths along with a sample of near-miss cases).

While medical causes of a maternal death can be seen from case notes and hospital reports, the socio-cultural circumstances can only be revealed through the cooperation of the family during an interview. These circumstances include the personal, family and
community barriers that prevent women from seeking care. This community-based approach, as was seen in MAPEDIR and the Tamil Nadu experience, is useful when most maternal deaths occur in the community and the determinants are not known. The disadvantages are that as the interview is not conducted by health workers, it may not be possible to determine accurately the medical cause of death. There may also be subjective bias when determining the direct or indirect cause of mortality leading to under- or over-reporting of cases. Hence, there is a need to train health workers, not only on the process of verbal autopsy, but also on clinical diagnosis of causes leading to maternal deaths.

The approach of a combined method – an FBMDR supplemented by a community-based MDR – has obvious advantages as it gives health-care providers an opportunity to learn from the findings and take corrective action at the local level. In addition, using a combined approach was found cost-effective as it does not require additional personnel, and is thus understandably the approach advocated by the GOI through NRHM. Records show that it has been tested, improved over the years and proven to be successful. However, the approach is not truly confidential and this may have legal repercussions.

Confidential enquiries or reviews as implemented in Kerala investigate maternal deaths and emphasize in practical terms the areas where change needs to take place by making recommendations not only to the health services but also to the community. This approach leads to an improvement in clinical services and quality of care. Information is collected at the local level confidentially and then assessed anonymously by a highly qualified, multidisciplinary independent group at the state level. This feature is an asset in this method, but the main drawbacks are that confidential enquiries incur higher costs, tend to focus uniquely on medical factors and do not necessarily follow up on the recommendations. The CRMD in Kerala deserves to be lauded for bringing on board the private sector – both for inclusion of deaths to be audited as well as having private sector experts in the audit; the historical fact that the CRMD was initiated and led by a professional organization is a strong impetus for its success.

Purely hospital-based MDRs as seen in Safdarjang Hospital, New Delhi, can be executed easily at low cost as medical officers are readily available in the obstetric department to undertake the review. The main bottleneck however is coordination between various hospital departments that handle pregnant women for gathering information, and lack of commitment from the administration to take action on the recommendations especially those involving inter-departmental coordination.

This study underscored a well-known fact – that for an MDR to be successful, it cannot be a stand-alone vertical intervention, but requires integration within the national programme. In respect of this, it can be surmised that the initiative of the GOI to use the NRHM platform is apt. The study also revealed a feature that is common to almost all countries that have initiated an MDR, i.e. adequate funds must be assured for its sustainability. Another common feature revealed was that, even though contexts and requirements may vary from state to state, core elements of MDRs need to be standardized across states and the quality of implementation monitored regularly.
There are clearly strengths and opportunities, as well as weaknesses and threats to the successful implementation of MDRs. In this study, two analyses were done. The first looked at the four specific MDR initiatives in terms of their strengths and weaknesses, and the requirements arising from these, as shown in Table 4. The second was on the overall MDR implementation in India as a SWOT (strengths, weaknesses, opportunities and threats) analysis, the results of which are shown in Table 5.

Table 4. Strengths and weaknesses of the four specific maternal death review initiatives

<table>
<thead>
<tr>
<th>Approach</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidential Review of Maternal Deaths</td>
<td>Anonymous. Both public and private hospitals are willing to submit details. No legal issues.</td>
<td>Requires an independent civil society to help conduct. Requires a central body to be in charge of maintaining anonymity and where required to give advice.</td>
<td>Need to find a way for systematic monitoring and follow-up on recommendations. Cannot identify underlying factors. Dissemination should be speedier.</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>Good representation of the committee if all technical experts are present. Can follow up on recommendations. Easy to recommend to the state. Easy to conduct at district and at facility.</td>
<td>Some underlying factors identified. Requires expert technical advisors. Not anonymous, potential for legal hassles.</td>
<td>Private hospitals need to be included. Monitoring and supervision are required for block and primary health centres.</td>
</tr>
<tr>
<td>UNICEF districts</td>
<td>Easy to conduct. Can identify underlying factors easily. Excellent for community involvement.</td>
<td>Difficult to influence facilities and state.</td>
<td>Pre-service and in-service training required. UNICEF had many disseminating workshops.</td>
</tr>
</tbody>
</table>
Table 5. **Strengths, weaknesses, opportunities and threats (SWOT) of the overall maternal death review in India**

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Guidelines for facility-based MDR and the formats included in the Indian Public Health Standards (revision 2010).</td>
<td>2. Poor reporting of maternal deaths, especially in urban areas, by private sector, migrant population and hard-to-reach areas.</td>
</tr>
<tr>
<td>3. Reporting of maternal deaths included under the health management information system (HMIS) of NRHM.</td>
<td>3. Maternal deaths during early pregnancy and due to abortion are not being reported.</td>
</tr>
<tr>
<td>4. UNICEF-initiated MAPEDIR well implemented in 42 districts in 9 states.</td>
<td>4. Lack of ownership of the programme by states and districts (NRHM and district magistrates).</td>
</tr>
<tr>
<td>5. Of 28 states reviewed, 21% have fully implemented and 36% have partially implemented MDR as per proposed guidelines.</td>
<td>5. Poor supervision of MDR at district and block level.</td>
</tr>
<tr>
<td>6. States like Tamil Nadu and Kerala and institutes of excellence like Safdarjang Hospital have implemented MDR and use information for programmatic action regularly. Clear orders to conduct MDR and mandatory reporting of all maternal deaths instituted.</td>
<td>6. Lack of training and resource persons.</td>
</tr>
<tr>
<td>7. Academia and professional organizations like KFOG were included in the MDR process.</td>
<td>7. MAPEDIR being implemented mainly as a project in many districts.</td>
</tr>
<tr>
<td></td>
<td>8. Funds for MDR not available in all state NRHM budgets.</td>
</tr>
<tr>
<td></td>
<td>9. Civil society organizations not involved in MDRs.</td>
</tr>
<tr>
<td></td>
<td>10. Tendency to focus on medical factors and not programmatic failures while conducting MDRs.</td>
</tr>
<tr>
<td></td>
<td>11. Lack of proper IEC and BCC for community advocacy.</td>
</tr>
<tr>
<td>Opportunities</td>
<td>Threats</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>1. Political commitment and sustained advocacy, both at national and state level, are crucial for successful implementation of MDR. Some opportunities for strengthening this are:</td>
<td></td>
</tr>
<tr>
<td>a. Review of MDR at national and state levels. Mission Director in all states to monitor MDR and take programmatic action when necessary.</td>
<td></td>
</tr>
<tr>
<td>b. Regular communication and feedback from the centre to states.</td>
<td></td>
</tr>
<tr>
<td>c. Institutionalize and make reporting of deaths compulsory both for private and public hospitals.</td>
<td></td>
</tr>
<tr>
<td>d. Provide adequate flexi-funds to implement MDR under the NRHM state PIPs.</td>
<td></td>
</tr>
<tr>
<td>e. Monthly reporting of MDR through HMIS.</td>
<td></td>
</tr>
<tr>
<td>2. Currently a vertical programme, MDR needs to be integrated with other interventions under RCH II / NRHM to make it effective and sustainable.</td>
<td></td>
</tr>
<tr>
<td>3. Involvement of civil society, women’s groups and communities to be included in the MDR process to strengthen reporting and reviews.</td>
<td></td>
</tr>
<tr>
<td>4. Monitoring and evaluation of MDR implementation to be included in NRHM review missions (Common Review Mission and Joint Review Mission) as well as periodic surveys (NFHS, DLHS etc.)</td>
<td></td>
</tr>
<tr>
<td>1. Political indifference in some states.</td>
<td></td>
</tr>
<tr>
<td>2. Administrative constraints: fear of punitive action and repercussion from the community result in reluctance from health functionaries to conduct MDRs.</td>
<td></td>
</tr>
<tr>
<td>3. Staff vacancies (especially of ASHAs and ANMs) who are required for MDR.</td>
<td></td>
</tr>
<tr>
<td>4. Private sector health-care providers not included in MDR implementation.</td>
<td></td>
</tr>
<tr>
<td>5. Cultural beliefs and practices: reluctance from community to provide information concerning maternal deaths.</td>
<td></td>
</tr>
</tbody>
</table>
An opportunity that deserves special attention is to integrate this vertical programme into NRHM for sustainability, which is already a policy of the GOI and therefore has a very good chance of success. The integration should also look at the opportunity of bringing on board the private sector, where a large number of deliveries take place. It is noteworthy that the CRMD in Kerala has already incorporated this.

### 6. Recommendations

Based on the findings of the review, the following recommendations are proposed under the two broad areas of scaling up MDRs and monitoring their activities.

#### 6.1 Scaling up maternal death review implementation in the states

- Conduct advocacy to sustain the current high level of national commitment to MDRs, and to motivate other states that have not yet institutionalized it.

- Conduct regular biannual or annual MDRs at the national and state levels. The Mission Director in all states should monitor MDRs and take programmatic action when necessary. Regular communication and feedback from the centre to states will facilitate this process. The MDR should also be included in the Joint Review Mission (RCH II) and Common Review Mission (NRHM).

- Institutionalize and make reporting of deaths compulsory both for private and public hospitals.

- Provide adequate flexi-funds to carry this process forward and to make it sustainable at all levels. A specific budget line for the MDR in the NRHM budget helps to ensure its importance among competing priorities.

- Accord priority to the proposed addition of monthly reporting of maternal deaths through HMIS; this will not only help to institutionalize the MDR but also help ongoing monitoring of implementation (see below).

- Integrate the MDR with other interventions under RCH II to make it effective and sustainable (currently the MDR is being implemented as a vertical programme).
• Develop and disseminate guidelines and programme support to programme managers at the district level. The functions of the National Core Group may be expanded to provide technical support for training and planning at the state and district levels. Strengthening pre-service training is one of the most effective ways to ensure a critical mass of skilled attendants in a long-term and sustainable manner. Active support from all stakeholders, especially at the district/state levels, will augment implementation.

• Incorporate the MDR in the terms of reference for MCH Level 1, 2 and 3 service providers. State implementation plans should include funds for MDR implementation, especially for the 265 high-risk districts.

• Empowering individuals, families and communities to participate in the development of community-based interventions for maternal mortality reduction will increase demand and use of available maternal and newborn health services.

6.2 Monitoring and quality assurance of maternal death review implementation

• State Mission Director NRHM to designate a nodal person to review the data from districts monthly even if there is nil reporting.

• As mentioned above, accord priority to the proposed addition of monthly reporting of maternal deaths through HMIS. This will not only help to institutionalize MDRs but also help ongoing monitoring of implementation.

• Institute a system of regular feedback to the state, districts and institutions: (e.g. a bi-yearly MDR Bulletin).

• Include the MDR in the ongoing monitoring of MDG 4 and 5.

• Put in place a quality assurance system of MDR implementation.

• Take remedial actions to address the gaps at all levels – the community, facility or higher levels.

• Conduct annual assessments for districts and blocks, and discuss services for remedial action with the Secretary of Health.

7. Conclusions

India has taken appropriate steps to institutionalize the MDR nationally through the NRHM, although its implementation remains variable among states and districts. Lessons learnt from the various methods of MDRs in states have been documented, especially from an analysis of the strengths, weaknesses, opportunities and threats of each method. Guidelines have been developed and training conducted; however it will take time for all states to implement them fully. The issue, therefore, facing MDR implementation in India is the development of strategies appropriate for the states to establish, scale up and strengthen monitoring of implementation of the MDR. This issue forms the basis of the recommendations made in this study.
8. References


Annex 1.

Questionnaire for maternal death review at different levels

**National level**

1. Introduction of Maternal Death Review (MDR) in India – historical perspectives?
2. How many states / districts are implementing Indian Public Health Standards facility-based MDR? (No.)
3. How many states have a Maternal Death Review Committee? (No.)
4. Is there a standard format of questionnaire that each state follows? Yes / No  
   Do the forms differ between the states? Main features?
5. Frequency of reporting: immediate / weekly / monthly / yearly?
6. Aggregate reporting or case-based: formats used?
7. To what extent is MDR seen as a meaningful mechanism for improving quality of maternal and newborn health services?
8. What is your opinion of the MDR implementation so far and its potential contribution to the reduction of maternal mortality ratio and improving access and quality of maternal and newborn health from the national level perspective?
9. What are your recommendations for improving the MDR process and its use in India?

**State level**

1. Is MDR institutionalized in the state? If not – any project-based MDR experiences (describe/reflect these experiences, including funding sources)?
2. First-level review: Is MDR conducted for all maternal deaths? If selective how are cases selected? Facility-based / community-based / MAPEDIR?
3. State / district MDR committees? Yes / No (%); Are all maternal deaths reviewed? If selective, how are cases selected?
4. What forms and formats are available for MDR reporting?
5. Who conducts MDRs?
7. MDR conducted (%) – review of records / registers – labour room / in-patient / emergency ward?
8. Training: when / where / for whom / by whom / how frequently?
9. Additional consultations / causality assessments conducted wherever needed? Yes / No.

10. Regular review of data / information done at the state / district level?

11. Programme action taken (policy, facility, community level – provide examples) to address findings and recommendations?

12. What is the potential of MDR in concerted efforts to achieve Millennium Development Goal No. 5? What are the challenges/constraints? Way forward?

**District level**

1. How do you get information from the blocks / communities about deaths?

2. Who conducts the interviews and how?

3. What kind of questionnaire is used?

4. Who is the informant (usually)? Is a reasonably accurate sequence of the steps leading to the woman’s death given?

5. How soon after the death are the interviews conducted?

6. Are other factors (e.g. socioeconomic status) taken into account?

7. Have the blocks or communities taken any precautions to avert further deaths? If so, were they as a consequence of the MDR?

8. Review of records and registers of facility / community-based audits conducted?

9. Any further comments in addition to the above? (state)

**Community level**

1. Who notifies a maternal death and how are you informed?

2. Who assesses the cause of maternal death (line of reporting)?

3. How are cases chosen for the review?

4. How do you choose the best respondent?

5. Do you have a questionnaire?

6. How soon after a maternal death do you interview the relatives?

7. Do block / district personnel come and interview the relative? Do they share their findings with you?

8. Have you had training to conduct MDR? If yes, type.

9. Have you made any changes in the community or followed up with local authorities or a health facility to prevent further maternal deaths?
Workshop for State Reproductive and Child Health Programme Officers on Implementation Review of MDR

1. Status of MDR: number of states / districts implementing MDR:
2. State / district Nodal Officer for facility-based MDR established: Yes / No
3. State / district MDR Committees established? (%)
4. Type of MDR conducted:
   a. Facility-based
   b. Community-based
   c. UNICEF MAPEDIR
   d. Confidential Enquiry
   e. Near-miss (SAMM) investigation
   f. Mixed.
5. Recommended guidelines / forms / formats used (Indian Public Health Standards 2010 / facility-based MDR Guidelines*):
   a. % of maternal deaths investigated
   b. % of maternal deaths investigated and reported < 24 hours
   c. % of medical termination of pregnancies investigated and reported < 48 days.
6. Reasons for missed opportunities for conducting MDR.
7. Maternal Death Surveillance Review:
   a. Data flow primary health centre – community health centre – district – state
   b. Aggregate / case-based data reported
   c. Hard (paper) copy / soft copy.
8. Training: when / where / for whom / how frequently?
9. Data analysis and review: state / district?
10. Causality analysis by MDR Committees conducted?
11. Programme changes undertaken: policy, facility, community level?
12. Funding – state / donor?

* Form completed for all deaths, including abortions and ectopic gestation-related deaths in pregnant women within 24 hours of maternal death or within 42 days after termination of pregnancy irrespective of duration or site of pregnancy.

The original remains at the institution where the death occurred and the copy is sent to the person responsible for maternal health in the State.
Annex 2.

List of persons interviewed

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation</th>
</tr>
</thead>
</table>
| National level – Government of India Officers and Development Partners | Senior Advisor, National Health System Resource Centre  
Assistant Commissioner Maternal Division, Ministry of Health and Family Welfare  
UNICEF, India  
UNICEF, West Bengal  
North East Regional Director for Resource Centre |
| Chennai, Tamil Nadu                  | Head of Department, GOSHA Hospital, Nodal Officer, Tamil Nadu  
Consultant UNICEF for Tamil Nadu and Kerala  
Consultant National Rural Health Mission, Tamil Nadu  
National Rural Health Mission Director, Tamil Nadu  
Director Public Health, Tamil Nadu  
Additional Director, National Rural Health Mission, Tamil Nadu |
| Vellore District, Tamil Nadu         | District Director Public Health, Vellore  
Professor, Christian Medical College, Vellore  
Head of Department, Christian Medical College, Vellore  
Vellore District, Public Health Nursing Officer, Tamil Nadu  
District Director Public Health, Tirupattur, Tamil Nadu  
Walajapet Taluk Hospital, Tamil Nadu  
Staff nurses, auxiliary nurse midwives, chief medical officers of primary health centres, subcentres, taluk hospitals and district hospital |
| Thiruvananthapuram District, Kerala  | Additional Director, Health Services (Family Welfare), Kerala  
Chairman, Kerala Federation of Obstetrics and Gynaecology  
Associate Professor, Obstetrics and Gynaecology, Thiruvananthapuram  
Doctors, chief medical officers, staff nurses, auxiliary nurse midwives, anganwadi workers of the Medical College, primary health centres, subcentres and community centres |
<table>
<thead>
<tr>
<th>Name</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhopal, Madhya Pradesh</td>
<td>Nodal Officer, National Rural Health Mission, Bhopal 2 health specialists, UNICEF, Bhopal Sultana Hospital, Bhopal Medical College, Bhopal</td>
</tr>
<tr>
<td>Guna District, Madhya Pradesh</td>
<td>UNICEF, Guna District, Madhya Pradesh Public health nurse, Guna District Hospital Doctors, chief medical officers, staff nurses, auxiliary nurse midwives, anganwadi workers of primary health centres, subcentres, district hospitals</td>
</tr>
<tr>
<td>New Delhi</td>
<td>Unit Chief, Obstetrics and Gynaecology, Safdarjang Hospital Head of Department, Obstetrics and Gynaecology, Safdarjang Hospital Unit Chief, Obstetrics and Gynaecology, Maulana Azad Medical College Head of Obstetrics and Gynaecology, Guru Tegh Bahadur Hospital Head of Obstetrics and Gynaecology, Lok Nanak Jaiprakash Hospital Head of Obstetrics and Gynaecology, Bara Hindu Rao Hospital Head of Obstetrics and Gynaecology, Dr Babasaheb Ambedkar Hospital Head of Obstetrics and Gynaecology, Kasturba Gandhi Hospital Head of Obstetrics and Gynaecology, Sanjay Gandhi Memorial Hospital Head of Obstetrics and Gynaecology, Babu Jagjivan Ram Memorial Hospital</td>
</tr>
<tr>
<td>Chandigarh</td>
<td>Head of Obstetrics and Gynaecology, Postgraduate Institute of Medical Education &amp; Research</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>Joint Director, Commissioner Health and Family Welfare and Additional Director, Maternal and Child Health, Fernandez Hospital</td>
</tr>
<tr>
<td>Name</td>
<td>Designation</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>Orissa, West Bengal, Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Uttarakhand, Jammu &amp; Kashmir, Himachal Pradesh, Rajasthan, Haryana, Goa (North), Tamil Nadu, Gujarat, Karnataka, Maharashtra, Punjab, Assam, Manipur, Kerala, Meghalaya (East Khasi), Tripura, Puducherry, Daman &amp; Diu, Dadra &amp; Nagar Haveli, Chandigarh</td>
<td>Direct interviews conducted with the State Nodal Officers during the National MDR Review meeting, December 2010</td>
</tr>
</tbody>
</table>
Annex 3.

Questionnaire for the Workshop on Implementation of Maternal Death Reviews in India, December 2010

State Level Data

Contact information:
- Name of state / district:
- Name and designation:
- Contact details: Tel.: E-mail:

State / district information:

1. Is MDR institutionalized in the state? If not – state project implementation plans / project-based MDR experiences (state/describe those experiences, including funding sources).

2. Is MDR conducted for all maternal deaths? Yes / No. How are cases selected for MDR? Facility-based / community-based / MAPEDIR?

3. National guidelines available for MDRs? Yes / No

4. Are state and district level MDR Committees formed?
   a. State: Yes / No
   b. Districts: All / If not, how many?

5. Forms and formats available for MDR and reporting? Yes / No

6. Who conducts MDRs at district level? Who constitutes the MDR Committee?

7. Data flow from primary health centre – community-health centre – district – state:
   a. aggregate / case-based?
   b. hard copy / soft copy?

8. Maternal deaths and MDR conducted by:
   a. review of records / registers?
   b. labour room / in-patient / emergency records?

9. Training: when / where / for whom / by whom / how frequently?

10. Additional technical assistance for causality assessments sought when needed? Yes / No

11. Regular review of data / information done at the state / district level? Yes / No

12. Feedback down to the facility / community being done? Yes / No

13. Programme action being taken whenever needed? Yes / No (If Yes, kindly provide policy, facility, community level examples.)
14. Do you think MDR can be used as a tool to decrease MMR? Yes / No
15. What are the challenges / constraints / suggestions in implementing MDR?
A study on the implementation of maternal death review in India
A study on the implementation of maternal death review in Indonesia
A study on the implementation of maternal death review in Indonesia
# Table of Content

Abbreviations ........................................................................................................................................ iv  
Executive summary .................................................................................................................................. v  
1 Introduction ........................................................................................................................................ 1  
2 Background .......................................................................................................................................... 1  
   2.1 Maternal death review – the methods ................................................................................. 1  
   2.2 Implementation of the maternal death review in Indonesia .............................................. 2  
3 Objectives and methodology .............................................................................................................. 4  
   3.1 Objectives ................................................................................................................................. 4  
   3.2 Methodology .............................................................................................................................. 4  
4 Findings .............................................................................................................................................. 4  
   4.1 The maternal and perinatal audit programme .......................................................................... 4  
   4.2 District-based audit of maternal deaths in South Kalimantan, 1995–1999 ....................... 8  
   4.3 Analysis of maternal and perinatal audit programme, Serang District, 2002 .................. 10  
   4.4 Tracing Adverse and Favourable Events in Pregnancy Care (TRACE Study) 2005–2006 ... 11  
   4.5 Study on contributing factors to maternal deaths and near-miss cases, Jakarta and Tanggerang, 2007 ... 12  
   4.6 Confidential enquires into maternal deaths tool development and pilot, Jakarta, 2008 ............... 14  
   4.7 Confidential enquires into maternal deaths – implementation pilot, West Nusa Tenggara, 2009 ... 15  
   4.8 Extending verbal autopsy to investigate biomedical and socio-culture causes of maternal deaths, 2010 ....... 18  
   4.9 Other Ministry of Health programmes related to the maternal death review ....................... 19  
5 Discussion ........................................................................................................................................... 20  
6 Recommendations .............................................................................................................................. 22  
7 Conclusions ......................................................................................................................................... 22  
8 References ......................................................................................................................................... 23  

## Annexes

**Annex 1.** Questionnaire used for in-depth interview of stakeholders ........................................ 25

**Annex 2.** Tool for focus group discussion with midwives on maternal death review in Indonesia .... 28
# Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC</td>
<td>antenatal care</td>
</tr>
<tr>
<td>CEMD</td>
<td>confidential enquiries into maternal deaths</td>
</tr>
<tr>
<td>DHO</td>
<td>District Health Officer (DHO)</td>
</tr>
<tr>
<td>DHS</td>
<td>Demographic and Health Survey</td>
</tr>
<tr>
<td>DIC</td>
<td>disseminated intravascular coagulation</td>
</tr>
<tr>
<td>ICU</td>
<td>intensive care unit</td>
</tr>
<tr>
<td>MCH</td>
<td>maternal and child health</td>
</tr>
<tr>
<td>MDR</td>
<td>maternal death review</td>
</tr>
<tr>
<td>MMR</td>
<td>maternal mortality ratio</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MPA</td>
<td>maternal and perinatal morbidity and mortality audit</td>
</tr>
<tr>
<td>MPDR</td>
<td>maternal and perinatal death reviews/audits</td>
</tr>
<tr>
<td>PHO</td>
<td>Provincial Health Office</td>
</tr>
<tr>
<td>PPH</td>
<td>postpartum haemorrhage</td>
</tr>
<tr>
<td>TBA</td>
<td>traditional birth attendant</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
</tbody>
</table>
In Indonesia, the maternal death review (MDR) has been institutionalized nationwide since 1997 at district level through the maternal and perinatal morbidity and mortality audit (MPA), which combines community-based and facility-based audits. The implementation of the MPA is known to vary between districts, and the initiative has not been documented properly. There have also been several other studies on MDR in Indonesia.

**Objectives and methodology:** The overall aim was to review the extent of implementation of maternal and perinatal death reviews/audits (MPDR) in Indonesia. Specifically the objectives were to (1) describe the processes and outcomes of MPDR initiatives in Indonesia; (2) recommend steps for strengthening MPDR; and (3) draw lessons and share experiences with other countries. This study covers the MPA and seven individual studies. A major methodology employed was a desk review of documents and reports; in addition, a qualitative sub-study was conducted to explore experiences from the MPA by interviewing several stakeholders in selected districts.

**Findings and discussions:** The MPA is implemented with standard procedures in which the village midwife begins the process by identifying and reporting the maternal (and perinatal) death, and presenting it to the audit committee at district level. The maternal deaths from the MPA show the expected profile. While several positive factors were identified, the MPA faces several constraints – under-reporting of maternal deaths, incomplete data, low level of funding, some overly bureaucratic procedures, lack of training for the personnel involved, and the MPA tool itself in which information is not comprehensive (this led to a revision of the MPA, which also incorporated confidentiality). The MPA has made several recommendations, some of which were taken up by the relevant authorities. The seven studies reviewed include those that were independent of and separate from the MPA, and those that were linked to the MPA, notably one that was conducted with the aim of testing the confidential enquiries into maternal deaths (CEMD) to be incorporated into the MPA.

The approach, objectives and processes of the studies varied, although some overlap was seen. The studies revealed several findings that can contribute to strengthening MDR efforts in Indonesia, including the MPA. The profile of maternal deaths was found to be very similar in these studies to the MPA. The MPA, by having both maternal deaths and perinatal deaths in its scope, may differ from similar initiatives in other countries. As expected of any nationwide programme, the extent of implementation varied among districts. The study highlighted the known fact that to prevent a maternal death, collaboration with sectors is necessary. The problems are likely to be similar to those encountered in other countries that have tried to implement a nationwide MDR – absence of well-planned infrastructure, poor systematic monitoring and evaluation, and difficulty in getting information. The lack of confidentiality is a main reason for the poor motivation among midwives. It was encouraging that the authorities were open to revising the MPA, which can benefit from other studies and programmes carried out by the Ministry of Health (MOH).
Conclusions and recommendations: Implementation of the MPA – the only nationwide initiative for institutionalized MDR in Indonesia – is variable. It is recommended that (i) confidentiality should be actively respected; (ii) the MPA improve its reporting and recording for a more complete identification of maternal deaths, and for this, coordination and linkage with the system of death registration should be pursued; (iii) efforts should be made to strengthen the clinical audits in hospitals, and to integrate or at least link these to the revised MPA; (iv) the MPA be given due priority, and local and central governments provide more resources for the MPA; and (v) monitoring and evaluation of the MPA programme should be done, following the steps and indicators outlined in the MPA guidelines.
1. Introduction

Maternal mortality in Indonesia has declined over the past several years. The most recent estimate was 228 maternal deaths per 100,000 live births (Indonesian Demographic and Health Survey [DHS], 2007), a decrease from 390 per 100,000 live births in 1990–1994 (Indonesian DHS, 1994). At the same time, from the same survey (Indonesian DHS 2007), it was reported that 73% of births were attended by a professional health provider; that 46% of women delivered their babies in health facilities, and that caesarean section rates increased from 0.8% in 1986–1989 to 6.8% in 2003–2007. From these impressive service coverage indicators, the decline in the maternal mortality ratio (MMR) seen above can be considered as relatively modest.

Counting numbers of maternal deaths or calculating MMR demonstrate the magnitude of the problem but do not provide information on how and why the woman died, or how the death could have been prevented. Lessons can be learnt from each maternal death through a maternal death review (MDR) also referred to as a maternal death audit, which examines the death from all aspects in depth and identifies the factors that led to the death.

To date, Indonesia has implemented and institutionalized MDRs through the maternal and perinatal morbidity and mortality audit (MPA) at the district level. However, the level of implementation has varied between districts and provinces, and there has been no proper documentation of the experience. There are also separate individual studies that were conducted including a few that were linked to the MPA. This current study was carried out to examine the situation of MDR in Indonesia. It has captured seven studies related to MDR, and some related to the MPA itself.

The status of MDR in Indonesia as reported at the Regional Workshop on Strengthening Capacity for Facility-based Maternal Death Reviews held in 2007 is as follows:

“The Maternal and Perinatal Audit (MPA) in Indonesia has been effected since 1997. The programme however is yet to be implemented in all districts and the quality of the audit varies among the districts. MPA is a verbal autopsy at the community level conducted by a midwife if the death had occurred at home, and a review of the records at the facility if the death had occurred in a health facility. The barriers to maximizing the use of MPA are: lack of understanding of the importance and potential benefits of MPA by health staff leading to superficial analysis of the cases (and hence less accurate recommendations), and poor follow-up.”

2. Background

2.1 Maternal death review – the methods

Review or audit of a maternal death is an approach to determine the causes and circumstances surrounding the death. This can identify the avoidable and unavoidable factors, upon which recommendations are made to avoid similar deaths in future. MDR is becoming an essential part of medical care in developed countries, while in
less-developed countries it is still relatively early in its development. As outlined in the guide Beyond the numbers – reviewing maternal deaths and complications to make pregnancy safer (WHO, 2004), the five methods of maternal death reviews are: (i) community-based maternal death reviews by verbal autopsies; (ii) facility-based maternal death audits/reviews; (iii) confidential enquiries into maternal deaths; (iv) clinical audits; and (v) audits of severe maternal morbidity or near-miss cases.

The facility-based maternal death audit has been adopted in countries such as Ethiopia, Malawi, United Republic of Tanzania and many others, while confidential enquiries into maternal deaths (CEMD) has been established in Egypt, Jamaica, Malaysia and South Africa (Kongnyuy et al, 2008; Sorensen BL et al, 2010; Bradshaw D et al, 2008). Most of these CEMDs are modelled on the United Kingdom model, which has been well established for many years.

In order to conduct an MDR, several steps need to be done: reporting the death, collecting data regarding events prior to death and the review itself. A common problem in a facility-based review is incomplete patient files and poor case documentation. Collecting data from the community through verbal autopsy is also often problematic, especially if the deceased did not have contact with a health facility or personnel. The interview can take place a considerable time after the death, resulting in a problem of recall. Verbal autopsy is useful to examine socio-cultural factors besides the biomedical/clinical causes of maternal death.

In many instances, maternal deaths from indirect causes are not reported even in a hospital. Studies have shown that indirect maternal deaths are often misclassified as non-maternal (Berg et al, 1996; Salanave et al, 1999; Qomariyah et al, 2009). This is even more of a problem when the death is in the community, and if the delivery was by a traditional birth attendant (TBA), the death is less likely to be reported (Suswardany, 2009).

2.2 Implementation of the maternal death review in Indonesia

The maternal and perinatal audit

Institutionalization of maternal (including perinatal) death audits in Indonesia dates to 1994, when the MPA system was introduced as a tool for continuous surveillance of maternal and perinatal mortality as well as for quality assurance of obstetric services in the district health system. The MPA guidelines were developed and distributed in 1997 by the Ministry of Health (MOH). These audits are conducted at the district level two to three times per year, depending on the budget allocated for the audit, and local resources. The MOH developed two forms for MDR, one for death notification, and the other for maternal death verbal autopsy.

Other specific maternal death review initiatives/studies

Many efforts have been made to improve and enrich the system or the instrument of MPA by conducting studies and activities. Those reviewed by the researcher are listed in Table 1 in chronological order. Some were MDR initiatives themselves, attempting to understand the causes and factors leading to the maternal death, the
A study on the implementation of maternal death review in Indonesia.

The second study (in Serang) essentially evaluated the MPA, and three studies (4, 5 and 6) were conducted to improve the MPA.

**Table 1. Maternal and perinatal audits reviewed in the study**

<table>
<thead>
<tr>
<th>Location</th>
<th>Year/ funded by</th>
<th>Title/scope of study</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 South Kalimantan</td>
<td>1995–1999/ MotherCare*</td>
<td>A district-based audit of the causes and circumstances of maternal deaths.</td>
<td>This closely mimics the national MPA.</td>
</tr>
<tr>
<td>2 Serang District</td>
<td>2002 (thesis, University of Indonesia)</td>
<td>Analysing implementation of MPA.</td>
<td>This investigates the inputs, processes and outputs – essentially evaluating the MPA.</td>
</tr>
<tr>
<td>4 Jakarta and Tangerang districts</td>
<td>2007/ WHO study</td>
<td>Contributing factors for maternal deaths and near-miss cases at selected referral hospitals using CEMD.</td>
<td>The findings were used as the basis for the introduction of CEMD in Indonesia.</td>
</tr>
<tr>
<td>5 Jakarta</td>
<td>2008/ WHO–MOH</td>
<td>CEMD tool development</td>
<td>Aimed to develop and pilot tools that will be used in CEMD implementation.</td>
</tr>
<tr>
<td>6 West Nusa Tenggara</td>
<td>2009/ MOH–WHO project</td>
<td>CEMD pilot.</td>
<td>Specially designed with the aim of making changes to the MPA by adopting CEMD.</td>
</tr>
<tr>
<td>7 Serang, Pandeglang districts</td>
<td>2010, part of Immpact Study</td>
<td>Extending verbal autopsy to investigate biomedical and socio-cultural causes of maternal deaths in Indonesia.</td>
<td>A two-country study in which Burkina Faso also participated as part of Impact.</td>
</tr>
</tbody>
</table>

* MotherCare is a project under John Snow Inc. funded by the United States Agency for International Development (USAID) to support safe motherhood initiatives in three districts in South Kalimantan province, by increasing the use of skilled birth attendants in the villages.

** Immpact (Initiative for Maternal Mortality Programme Assessment) is a global research project – supported by the Bill & Melinda Gates Foundation, the United Kingdom Department for International Department (DFID), the European Commission and USAID – to provide rigorous evidence for decision-makers on effective interventions to improve maternal and newborn health.
3. Objectives and methodology

3.1 Objectives

The overall aim of the study was to review the extent of implementation of maternal and perinatal death reviews/audits (MPDR) in Indonesia. Specifically the objectives were:

i) to describe the processes and outcomes of MPDR initiatives in Indonesia including the MPA programme and other specific MDR studies;
ii) to recommend steps for strengthening MPDR in the country; and
iii) to draw lessons and share Indonesia’s experience with other countries in the South-East Asia Region.

3.2 Methodology

This study covers the one national institutionalized MDR (the MPA programme), and the seven individual studies listed above. Hence a major methodology employed was a desk review of documents, papers and reports.

In addition, this study undertook a qualitative sub-study aimed to explore experiences and lessons learnt on MPA from health policy-makers at the central and district levels, national review committees, officials from hospital, obstetricians, and midwives at primary health centres (puskesmas). This sub-study aimed to obtain Information on input and process parameters, and thereby explain why MPA works in some areas and not in others. It also assessed recommendations and their uptake or usage. In-depth interviews were conducted with several informants from the MOH, District Health Office, hospitals and health centres. These took place at central and district levels – including South Jakarta, Bogo, and Bandung – and West Nusa Tenggara at the provincial level: policy-makers, obstetricians and hospital superintendents. Focus group discussions were conducted with midwives from South Jakarta municipality and Bandung district, in which a triangulation of information was done to obtain relevant information. Annex 1 is a sample questionnaire used for the MOH, and Annex 2 is the tool used for the focus group discussion conducted with midwives.

4. Findings

The findings are described below, first of the national MPA initiative, followed by each of the seven individual studies reviewed by the researcher. There is also a short section that briefly mentions the other initiatives/programmes in the country that support MDR.

4.1 The maternal and perinatal audit programme

Approach and objectives

As mentioned above, the MPA programme was initiated in 1994 and has been implemented nationally since 1997. This current study undertook a qualitative sub-
study to see better the progress of the MPA, focusing on the barriers and facilitating factors for recording/reporting as well as for conducting the audit.

The process

A village midwife visits the family of the deceased to do a verbal autopsy, usually within one week after the death, using a verbal autopsy form that seeks information on clinical signs and symptoms, birth attendance as well as socio-demographic variables that might have contributed to the death. If the woman died in a hospital or other health facility, the village midwife will collect the information on care received by the woman from case notes in that facility. The midwife will then assign the cause of death and send the document to the related District Health Office (DHO) for selection of cases to be included in the MDR. Selected cases will be presented by the midwives who provided care to the deceased in a meeting attended by representatives from the DHO, the hospital directors, obstetricians and other relevant stakeholders – midwives in the district, professional organizations such as IBI (Indonesian Midwives Association). This meeting is called a “medical” audit. Another audit, the “social” audit, may also be conducted, involving other stakeholders in the district such as Head of the Sub-District, community leaders, religious leaders, women empowerment and other groups in the community.

Maternal death profile

The findings overall show that a maternal death is associated with low education level, low socioeconomic status and thus inability to pay for costs of delivery, inadequate or no antenatal care (ANC) during the later part of pregnancy, and delivery at home. In addition to these, there are also local harmful cultures and traditions associated with maternal deaths.

Strengths and opportunities

• There are positive trends that facilitate the implementation of the MPA. Some local governments in provinces and at districts level accord priority for maternal and child health (MCH) services and have put in place regulations or a policy to strengthen the programme. This commitment from local governments is especially true since the decentralization of health services in Indonesia. For example, the head of local government in Jakarta made an extra effort for women empowerment for his area, overseen by his wife, and this will in turn have a positive impact on maternal health.

• The commitment of the obstetricians is high. In many areas, recommendations formulated after the MPA meeting have been used as inputs for district planning.

Weaknesses and challenges

• There is some under-reporting of maternal deaths, whether due to the midwife deliberately not reporting due to fear of being blamed during audit, or merely due to unreachable deaths. Under-reporting of maternal deaths is particularly
a problem if a death occurs in another administrative area. In many instances, due to incomplete data, the conclusion and recommendation may be based on assumption, not on hard data. Obtaining data from other institutions, in particular hospitals, is generally difficult and made worse if an obstetrician was involved in providing care to the deceased.

• At the DHO level, it was opined that the questions in the MPA form were not comprehensive, especially for questions related to non-medical information. Reporting of a death was found to be timely in South Jakarta, because this was done by telephone immediately after the midwife was notified. In Jakarta, verbal autopsy was done directly after death notification. When asked about the inclusiveness of maternal deaths, e.g. whether deaths due to indirect causes such as tuberculosis, dengue haemorrhagic fever, typhoid, etc., or due to cases such as ectopic pregnancy, hydatidiform mole, the informants from DHO responded that all such cases were included as maternal deaths.

• Central level informants felt that the start of MPA implementation was ill-managed and not well-designed. The national approach depends on availability of personnel at all levels, which is a constraint. Bureaucratic procedures are another barrier; some personnel expressed that they had to “struggle” to obtain the data, and some became demotivated by this.

• The mechanism of the MPA itself can contribute to inadequate auditing, because cases to be audited are based on a selection submitted by the MPA coordinator. There were no training modules or formal trainers for the programme; it depended solely on the guideline developed in 1997. Information in the guideline is considered to be insufficient, and is open to different interpretation by the local authorities in implementing the programme; moreover, the questions in the form were insufficient to learn adequately of the circumstances surrounding the death. Informants felt that the audit carried out only once or twice a year was not sufficient, and that this was due to the low budget for MPAs. There was a tendency to blame the midwife as, being the person who presents the case, may be less likely to report and may withhold some information. In many cases, the midwives felt that actually the TBAs should be held responsible, because patients are referred to midwives only when they are already in bad shape.

• Restricted budget was always mentioned by the informant, be it the authority at the central or district level, the obstetricians or the midwives, except those from South Jakarta Municipality. Informants from Jakarta revealed that the Governor was committed to improve health care in general, and maternal health care in particular.

“…commitment from the Governor is good… in fact, there is a road show from the Governor’s wife once every two weeks to promote women empowerment, including maternal health…”

• Obstetricians expressed some concern regarding lack of clarity on the basis for decision and recommendation. Another problem expressed by obstetricians was
the selection of cases to be reviewed/audited, for which they were often not involved. One of them felt that his expertise was under-utilized.

- There was poor understanding of the broad determinants of maternal health and survival that go beyond the health system and institutions such as DHO, Provincial Health Office (PHO), hospitals, primary health centres, doctors, midwives and nurses. While there is a “social” MPA – an MPA meeting with non-health sectors such as the head of sub-districts, religious and other community leaders – this is not always optimal.

Expectations and suggestions for the Maternal and Perinatal Audit

- The local DHO needs to advocate for sufficient budget for MPAs to the local government.

- Recommendations should be specific and sent to the relevant party.

- A better information system, and a better compilation of maternal death data at district as well as province level, should be established.

- A formal training programme should be developed to generate a sufficient number of competent facilitators who can properly train health personnel in implementing MPAs.

- A monitoring and supervision system for MPA implementation should be developed.

- Cooperation with health professional bodies/institutions such as POGI (Indonesian Obstetrics and Gynaecology Association) should be encouraged.

- Coordination with health facilities, especially hospitals, in sharing data needed for MPAs should be improved.

- The decree for MPA implementation should be renewed every year to anticipate the frequent turnover of health personnel involved in the MPA team.

- Medical personnel should be involved from the beginning of the MPA implementation process, such as in selecting cases to be included in MPA meetings.

- A clear policy about duties and obligations of midwives in light of their limited authority in caring for the patient should be formulated.

Revision of the Maternal and Perinatal Audit programme

Based on the study in West Nusa Tenggara (see 4.7 below), which in turn was based on earlier studies on CEMD, the MPA was revised because the information gathered using the old forms were considered insufficient. In addition, the “blaming–naming–shaming” atmosphere was shown to be negative and made midwives unwilling to
report deaths, and lessons learnt from the case could not be internalized due to their demotivation. It was also felt that confidentiality would encourage hospitals to share their data. The additional aspects in CEMD that are new to the MPA programme are more comprehensive forms for data collection, structured forms to assess or review cases, and the strategy to assess cases where the person who is involved in providing care does not have to be present and judged at the meeting, and documents to be assessed are anonymous and confidential.

The preparation for the revised MPA programme includes adapting the forms used for the CEMD pilot; improving the flow of reporting a maternal death, especially if the death involved a woman from a different administrative area; and developing the guideline and the training module. Apart from this, training for facilitators for all provinces in Indonesia has been conducted at the central level. These facilitators will conduct training for trainers in their province, and the provincial trainers will then train district personnel where the programme is based.

4.2 District-based audit of the causes and circumstances of maternal deaths in South Kalimantan, Indonesia, 1995–1999

Approach and objectives

The study in South Kalimantan is very similar to the MPA described above, and was carried out under the sponsorship of MotherCare from 1995 to 1999. Although the audit focused on both perinatal and maternal deaths, the report is mainly concerned with the latter. The audit aimed to bring about a reduction in perinatal and maternal mortality through an improvement in the quality of MCH services at the district level. More specifically, it aimed to: identify substandard care factors for maternal and perinatal deaths; strengthen links between the district health office, district hospital and health centres; make recommendations for the improvement of service organization and clinical care at the district level; and assess the main causes of maternal and perinatal deaths. In addition to facility-based elements of care, the audit explored obstacles to obtaining care at the community level, e.g. delays in family decision-making and transportation problems.

The process

The village midwives are responsible for reporting all maternal and perinatal deaths in their community to the health centre. The midwives may learn about these deaths because they have cared for the women who have died or because they have received reports from village leaders or TBAs. In addition, maternal deaths occurring in hospital are reported directly to the district health office, which passes the information to the village midwives. The audit is conducted within one week of the death report. A pathway is constructed to depict the series of events that may have led to the perinatal or maternal death. Particular attention is paid to documenting the occurrence of and the reasons for delays in the following: family decision-making to refer a woman with a complication; reaching appropriate care; and receiving care from the health provider once the appropriate level of care has been reached. For women who were in contact with the health services before death, the village midwife obtains further
information from TBAs, midwives, and/or doctors. If a woman was hospitalized, the village midwife also consults the medical records, and copies parts that are relevant to the case, where available. Finally, the village midwife assigns a cause of death and reports directly to a health centre, where a senior midwife or a doctor checks that the information collected is complete and consistent and verifies the accuracy of the cause of death. All interview forms are sent to the district health office.

At intervals of 1–2 months, a meeting is held of the district maternal and perinatal audit team. If desirable, representatives of women’s organizations or other community groups are invited to attend. The meeting is generally limited to 20–30 persons. The number of cases audited is limited to two or three, usually including one maternal and one perinatal death. The cases are selected on the basis of the nature of the problems identified and the frequency with which the medical causes of death occur. In order to allow more midwives to participate, the districts have held smaller sub-district meetings at three-monthly intervals. Each sub-district meeting generally involves four or five community health centres. These meetings have a similar format and are additional to the district meetings.

Maternal death profile and contributing factors

Between 1995 and 1999 the village midwives conducted 130 postmortem interviews in South Jakarta, West Nusa Tenggara and South Kalimantan districts. The leading causes of death were haemorrhage (41%), followed by hypertensive diseases (32%). The three districts had similar patterns of reported causes of death. Only 41.5% of the women had been seen by a midwife or a doctor before death, and 69.2% of deaths occurred elsewhere than in a health facility. Aggregate information on contributing factors was available for 30 maternal deaths audited in 1998 and 1999. Delays in decision-making and poor quality of care at the health facility were seen as contributing factors in 77% and 60% of the deaths, respectively. Among the most prevalent aspects of poor quality of care cited were delays in seeing a health provider, inadequate care, and care that did not conform to protocols. Economic constraints were believed to have contributed to 37% of deaths. Delay in reaching a health provider or health facilities accounted for 33%.

Strengths and opportunities

• The audit fosters a closer working relationship between the different levels of health-care providers by bringing together those who are facility-based and those who are community-based to analyse and deal with the causes of mortality in their areas. The audit could benefit from a greater involvement and clearer definition of the role and responsibilities of the provincial team.

• The inclusion of village leaders, religious officials and other policy-makers in audit discussions promotes an intersectoral problem-solving approach to safe motherhood.

• The audit has resulted in improvements in some aspects of the district health systems. The recommendations arising from the audit cover additional training for
midwives, the need for a blood bank and specific drugs, and the need for standard treatment guidelines.

Weaknesses and challenges

- As was found in the MPA, the midwife felt that she is exposed to blame, and this is especially so if there was no obstetrician involved in the case. Although the audit does not intend to apportion blame, a number of inherent features in the current system tend to put most of the responsibility and potential blame on the actions of village midwives, largely ignoring the role of underlying systems. The lack of confidentiality in the current system may already have resulted in resistance to the reporting of cases for audit.

- By using the village midwife as the central vehicle for reporting, the audit tends to focus on factors contributing to maternal deaths in the community rather than on those in health facilities.

4.3 Analysis of maternal and perinatal audit implementation in Serang District, 2002

Approach and objectives

This study was conducted as a thesis in the University of Indonesia in 2002 in Serang district, West Java, in response to the high MMR in the district (425 per 100 000 live births in the year 2000). This study investigated the input, process and output of the district maternal death audit. Input factors were the provider’s knowledge on the maternal death audit, organizational structure, facility and cost of the audit. Processes included coordination among the health providers involved, the methods of the audit, supervision and feedback. Outputs were the recommendations and their follow-up.

The process

Maternal death data were collected from deaths reported to a health centre, which was followed by tracing the case in the community for verbal autopsy with the deceased’s family. Midwives in the health centre were responsible for completing forms and reporting deaths to the DHO or MPA team at district level. Physicians and midwives from primary health centres were interviewed through focus group discussion. The respondents were health providers who held the district-level maternal death audit, i.e. physicians and midwives at 16 primary health centres, hospital directors (referral hospitals) and hospital heads of medical services, obstetricians from hospital level, and two staff from the local DHO who were in charge of MCH. Documents from the primary health centres, hospitals as well as from the DHO were also examined. The data collected from the respondents were triangulated. Audit meetings are held in an open situation where the midwives present the case; usually, meetings are held once every three months.

Strengths and opportunities

Coordination between the hospital and the DHO was good, according to opinions of
both hospital and DHO personnel, witnessed also by the fact that funding for MPAs was also provided by the hospital.

**Weaknesses and challenges**

- There was inconsistency in reporting; the midwives said the forms provided by the DHO were not enough and had to be photocopied. Apart from incomplete data, it was seen that implementation of recommendations was a problem.

- The capacity of human resources at district level to analyse the data was also lacking. Often, they only collect the data and no further action for data analysis is carried out as a basis for planning development.

- Other problems related to supervision and skill development or capacity-building.

- There was insufficient funding for transportation to the deceased’s family. The overall funding for MPA meetings was found to be sufficient; however, funding for following up recommendations and suggestions was lacking.

- Physicians at the health centre (puskesmas) level revealed that the health provider’s knowledge on the programme was insufficient.

- Some health providers considered the MPA as just a forum to discuss interesting and important cases, and not necessarily to come to a recommendation to solve problems found; this was disclosed by an obstetrician.

- It was suggested that the organizational structure should be developed and supported by a decree by the district head or head of the DHO.

### 4.4 Tracing Adverse and Favourable Events in Pregnancy Care (TRACE Study) 2005–2006

**Approach and objectives**

This sub-study was carried out under the auspices of a project called Immpact (Initiative for Maternal Mortality Programme Assessment) in Pandeglang district, Banten Province. The objective was to evaluate a midwife’s contribution to manage obstetric complications in women who died or survived as a near-miss case. The study used the CEMD approach of the United Kingdom, and confidentiality was maintained during the audit.

**The process**

Data were collected through in-depth interviews with providers, family and community members who were involved in the maternal death or near miss (for which the woman herself was interviewed). Transcripts of interviews were used as tools to assess the care, replacing the medical record of the patient. Deaths and near-miss cases were identified from the Immpact study that met the criteria and resided in Pandeglang
district and died during the six months prior to data collection. Deaths and cases identified in the community were also included. Audit meetings were conducted routinely over a period of six months, with at least one Immpact researcher present at each meeting as facilitator. The review or enquiry process was done using a structured case assessment form (based on the United Kingdom CEMD forms), which allowed the panel to evaluate topics related to the individual, family and community; the health system; and the level of clinical care provided by midwives.

Maternal death profile

Ten cases of near miss and three maternal deaths were reviewed, two of which were deliveries in the patient’s or relative’s home. Regardless of where the delivery occurred, the majority of the cases were referred to a comprehensive emergency obstetric care facility. Most cases showed unnecessary delays with decision-making, arranging transport and finance, and time waiting for the midwife to come.

Strengths and opportunities

- The audit recommended that midwives should work in partnership with other providers, promote birth preparedness, improve awareness towards health insurance, and undergo training to improve their clinical competencies.

- Actions have been taken to improve communication between village midwives, private midwives, as well as midwives in clinics or referral facilities.

Weaknesses and challenges

- The study showed that village midwives with official responsibility for the village where the emergency occurred were not available to give care. One reason for this is that they are responsible for several (up to five) villages. This problem was coupled with geographical barriers. Midwives were also under-utilized because they were perceived as too young and inexperienced, in addition to the costs involved.

- The audit panel found that midwives’ clinical skills were often lacking, with competency not meeting the requirements of a skilled attendant. However, it was seen that midwives were able to recognize danger signs, to decide rapid and appropriate referral leading to reduced delays to reach the hospital. Birth preparedness and complication readiness were lacking in all cases reviewed, including the understanding of health insurance schemes for the poor.

4.5 Study on contributing factors related to maternal deaths and near-miss cases at selected referral hospitals in Jakarta and Tanggerang, 2007

Approach and objectives

The study was conducted from February to December 2007 at five selected referral hospitals, four of which were located in Jakarta city and one in the District
of Tanggerang. Three of the five hospitals are teaching hospitals for residence in obstetrics and gynaecology from the University of Indonesia, while the other two are district hospitals. The objective was to identify medical and non-medical causes of and situations surrounding near-miss maternal deaths or deaths that occurred in health facilities. The information obtained from this study was to be used as the basis for the introduction of CEMD in Indonesia.

The process

All death cases were identified in five participating hospitals during the year 2005. Cases selected were those who experienced haemorrhage, pre-eclampsia/eclampsia, postpartum infection or obstructed labour. Data were collected by specially trained midwives from each participating hospital. Information concerning family factors, relatives and the community were obtained by in-depth interview with the husband and/or her close relatives. Additional data were also taken from health personnel if they had referred the deceased. Hospital data, including records of ANC, referral, admission, partograph and other medical data were also collected. Verbal autopsy was done within seven days after the death. If the case was referred by health personnel, an in-depth interview with the health staff who referred her was carried out immediately (not more than seven days) after the death. A research review committee and hospital review committee (one person from each hospital, presumably an obstetrician) were established to conduct the audit. It is not clear how the meetings were carried out for this study. There had not been any audit committee established in any of the hospitals prior to the study.

Maternal death profile and contributing factors

Between February and December 2007, 30 maternal deaths were reported in the five hospitals, 29 of which were direct obstetric deaths. The leading causes of death were hypertensive disease (50%) followed by haemorrhage (27%). The first providers attending the deaths were: midwives (in 15 cases), health centre/maternity homes (3 cases), and TBAs (3 cases). Nine cases went directly to hospital. Most cases received treatment promptly when referred to the participating hospitals. Half the contributing factors to maternal deaths were related to inappropriate care by the first providers (mainly midwives and some TBAs). It was noted in this study that midwives did not give appropriate treatment for postpartum haemorrhage (PPH), and did not administer magnesium sulphate for severe pre-eclampsia/ eclampsia. Seven cases were reported to be related to delay or inappropriate care in the hospital.

In general, maternal death cases were of low socioeconomic status. In slightly more than half of the cases, the family stated that they had to use out-of-pocket money to pay for care. Only a few relied on government insurance for the poor, and a few more did not know how to pay for the expenses. The majority of maternal deaths had had four or more antenatal visits. They preferred to choose the closest attendants, i.e. midwives living or practising nearby, and in two cases, the hospital for ANC because of its proximity to their homes. Midwives in this study expressed concerns including the need for more space to deliver the service, better access to life-saving medicine, more staff for quality of care, more training in critical care, more transparency in planning and funding, and doctors who are always available to perform operative care.
Strengths and opportunities

- Recommendations made by the audit team include improvement of standards of emergency perinatal care, training for midwives in hospitals as well as those in private practice, in particular for emergency obstetric care, and regionalization of perinatal care to improve the referral system.

- Regular weekly clinical meetings are able to provide feedback for recommendations and timely actions.

Weaknesses and challenges

- The non-availability of doctors around the clock to provide emergency services is a major factor that hinders the saving of a woman’s life.

4.6 Confidential enquiries into maternal deaths tool development and pilot in Jakarta, 2008

Approach and objectives

As a preliminary activity for CEMD, including a review of 20 maternal deaths from different hospitals, this study was to develop and pilot the tools to be used in CEMD implementation. The tools developed were based on existing tools: (i) tools used for national MPA; (ii) modification of MPA tool developed by MotherCare project in South Kalimantan; and (iii) tools used for CEMD in South Africa (documented in Beyond the numbers, 2007). The tools consisted of two forms for data collection, one for clinical data (CEMD I) if the woman had ever been given care in a health facility (in this pilot study, only data from hospitals where the woman died were collected); and the other form for verbal autopsy and non-medical data (CEMD II). Two further forms were used for case assessment.

The process

Midwives from the hospital where the death occurred were trained to complete the form for clinical data. Verbal autopsies were done for six cases by interviews with the family/community by the research team along with the midwife responsible for the area. Verbal autopsies were done between three months and one year after the death. For cases based on MPA files only, an abstraction of the new forms was done. The audit team consisted of two obstetricians, one anaesthesiologist, one senior midwife, and one staff member of the MOH Directorate of Mother’s Health. All data were made anonymous before being sent to the assessors. On average, each meeting audits three cases. The assessors were provided data collection forms (clinical for all cases and verbal autopsy for six cases) about a week prior to the meeting.

Maternal death profile

Twenty cases were selected from convenience sampling because the aim was not to study the profile of maternal deaths but to see the applicability and feasibility
of the tool developed. PPH was the major obstetric complication related to the sampled deaths (6 cases), followed by hypertension during pregnancy (5 cases), antepartum haemorrhage (4 cases), embolism (2 cases), and 1 case each with septicaemia, intra-abdominal pregnancy, and molar abortion. Two cases with hypertension during pregnancy who then died due to PPH were categorized as PPH. Among the cases with haemorrhage (ante- or postpartum) or hypertension during pregnancy (total of 15 cases), disseminated intravascular coagulation (DIC) was developed in 7 cases during the course of the complication. Almost all cases did not have the problem of transferring the patient to the hospital (transportation was available). However, the quality of transferring the patients was not adequate, since rented motorcycle or motorized tricycle were used, even for moribund patients. Non-functioning of the emergency team in the hospital led to delays in managing emergencies. The role of anaesthesiologists in obstetric emergencies is critical; many cases were from secondary level institutions where there was no intensive care unit (ICU). Although tertiary level institutions are available in the area, access to these facilities could not always be guaranteed.

The audit recommended that reporting and recording needed to be improved to meet requirements for a CEMD, and that the tool developed should be piloted in a real setting. Subsequently, this recommendation was taken up and a second preliminary CEMD pilot at the provincial level was carried out in West Lombok.

Strengths and opportunities

- Using all information from the developed tool it is possible to investigate and conclude whether deaths could be avoided. This is especially true for cases whose data were collected as primary data from medical records (with or without verbal autopsy), but less so when the source of data was from MPA files.

- The enquiry process used can be considered close to the “ideal” requirement, with confidentiality and information to suggest solutions.

Weaknesses and challenges

- There was still inadequate recognition of the problem/diagnosis in more than half of the cases, due to incomplete medical records, problems in communication among health providers before, during and after the onset of emergency, and inadequate monitoring.

4.7 Confidential enquiries into maternal deaths – implementation pilot in West Nusa Tenggara, 2009

Approach and objectives

Like the two previous studies, this was an initiative to begin to adopt CEMD in Indonesia, and was intended to be the model for its adoption, before the revision of the MPA. This study involved primary data collection of maternal deaths reported in all health facilities. The CEMD system was proposed to be at the provincial level, where a CEMD secretariat was established.
The process

All information from the beginning of a pregnancy to when a woman died was collected by the midwife/coordinator recruited in the study. Prior to data collection, training was conducted to complete the CEMD I (for clinical data) and CEMD II (verbal autopsy and non-medical data) forms, followed by piloting the tools in the field. Village midwives assisted the midwife/coordinator in arranging verbal autopsy in the community as well as providing clinical data if she had given care to the patient. For deaths that happened in hospital, clinical/medical data collection was done by senior midwives from the hospitals. There were two sets of assessor teams. One team consisted of assessors from Jakarta who were involved in the previous CEMD pilot activity. The other team was from Nusa Tenggara Barat province. Findings obtained from case assessments by the assessor team were analysed, collated and summarized by the technical team. The technical team is expected to analyse all data and results and produce conclusions and recommendations, in collaboration with the assessor team. The final task of the technical team is to advocate the recommendations to the CEMD Provincial Board. The proposed system of CEMD is depicted in Figure 1 below.

**Figure 1. Diagram of proposed implementation of confidential enquiries into maternal deaths system**
Maternal death profile

Samples were obtained from the routine recording and reporting system for maternal deaths (Table 2). Among direct obstetric causes (15 cases), PPH was the major complication, followed by hypertension during pregnancy, pregnancy related sepsis, and antepartum haemorrhage. Two of the direct maternal deaths developed DIC. There were three non-pregnancy related maternal deaths. Five women died at home, two of whom had delivered in hospital and been discharged by the physician. One case died while being transferred to a health centre. The remaining 12 cases died in the health facility.

Table 2. Causes and places of maternal deaths in West Lombok District, 2008

<table>
<thead>
<tr>
<th>Cause</th>
<th>Cases</th>
<th>Died at health facility</th>
<th>Died at home</th>
<th>Died on the way to health facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postpartum haemorrhage</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Hypertension during pregnancy</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Sepsis</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Antepartum haemorrhage</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Non pregnancy related</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Unknown (due to lack of information)</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

Slightly less than 50% of cases faced a serious problem with transportation during the onset of emergency. This was especially true for the majority of cases who lived in remote areas (in the mountains or on another island). Thirteen were referred by midwives who accompanied them to the health facility. Non-availability of a functioning health facility on weekends and holidays was a feature in some cases. Lack of blood supply at the district and provincial hospitals, and lack of ICU beds were further constraints. More than 80% of the cases had ANC several times, suggesting that midwives lacked competency. Communication between midwives and patients who lived in remote areas was not effective, and thus patients were not well prepared for an emergency situation. Among the recommendations made were to improve skills of midwives to have standardized pre-service and in-service competency, good clinical governance in hospitals and a better system of communication and coordination between hospitals and health offices.

Strengths and opportunities

- For the development of the CEMD, the data collection was shown to be manageable.

- Communication and coordination between hospitals and health offices was improved during the CEMD pilot. The hospitals were willing to share clinical data for the enquiry, coordinated by the PHO, which was not the case prior to the pilot.
• A meeting with potential members of the provincial board (consisting of local authorities from different sectors such as transportation affairs, family planning, education, and many others) has been held.

**Weaknesses and challenges**

• The MPA tools and system do not as yet incorporate confidentiality and this should be implemented by adopting the CEMD.

• For the CEMD itself to move forward, two important factors have to be ensured: the completeness of maternal death recording and reporting, and the assurance of confidentiality, which will be challenging.

• Support from the central government to finalize the establishment of the provincial board was not obtained and there has been no further progress.

4.8 Extending verbal autopsy to investigate biomedical and socio-cultural causes of maternal deaths, 2010

**Approach and objectives**

Indonesia was one of two countries for this study (the other was Burkina Faso). The study aimed to (i) extend the standard verbal autopsy to include additional information on experiences of emergency care-seeking, from the perspectives of family members; (ii) identify biomedical and socio-cultural factors relevant to outcomes; and (iii) present an illustrative analysis on the utility of the extended verbal autopsy to routine use. The study was conducted in Serang and Pandeglang districts, Banten province. It was conducted with relatives of 104 women who died from maternal causes. Information was collected on medical signs and symptoms of the women prior to death and an extended section collected accounts of care pathways and opinions on preventability and cause of death.

**The process**

Cases were selected from a previous village-based informant survey conducted in 2006 that identified, and conducted verbal autopsies on 474 maternal deaths that occurred between 2005 and 2006 (Ronsmans et al, 2009) in Banten province. From the two districts, 104 maternal death cases were selected. The selection was purposive to be within the time and resources available to the study, and the most recent deaths were selected to reduce recall bias.

Data were collected by trained interviewers using a questionnaire in two parts. The first part of the interview was a structured checklist style of closed questions on the medical signs and symptoms of the woman prior to death that approximated standard verbal autopsy questions. The questions were made as culturally meaningful as possible in each setting. The second part was guided by a conceptual framework of delayed treatment in obstetric emergencies to get a pathway to reconstruct events that may have led to the death, encapsulated in the “three delays” model (delay in
decision to seek care, delay to reach a health facility, and delay in receiving adequate quality care in a health facility). Instead of an audit team in this study, data were collected and analysed by the researchers. To determine underlying causes of death, a model called Interpreting Verbal Autopsy Data for Maternal Deaths was used. This model uses a probabilistic approach to interpret verbal autopsies for possible cause of death (Forttrell et al, 2007, Byass et al, 2009). There were no meetings with local health authorities; their involvement was rather to secure permissions for interview.

Maternal death profile

Of the 104 maternal death cases, pregnancy-related sepsis accounted for 29%, haemorrhage 13% and malaria 8%. There were only 4% of cases of pregnancy-induced hypertension. Since the cause of death was assigned using a computer model based on probabilistic approach, deaths related to HIV/AIDS (2%) were present in this group of women. This was not very different from obstructed labour combined with ruptured uterus, which usually is a prevalent cause of death in Indonesia. Particular attention in this study was paid to the “three delays” model. Delay in a decision to seek care was seen in 45% of deaths according to their relatives, 66% and 44% experienced delay in reaching a health facility after the decision was made, and in receiving quality care in a health facility, respectively. Delay in deciding to seek care was mostly due to fears over the cost of care, dissatisfaction with midwives’ lack of responsibility and the bureaucratic process required to prove poverty. Owned or rented motorbike or minivan (used as public transportation) were the most common modes of transportation in the area. Some respondents expressed the view that the deaths were not preventable, as it was fated that the women should die, and that the death was caused by magic. Regardless of the cause of death, significant delays are a major contributing factor. Unaffordable obstetric emergency care, coupled with harmful traditional beliefs were found to be tough challenges in preventing maternal deaths, particularly in this area.

Strengths and opportunities

The extended verbal autopsy used in this study was successful in integrating the biomedical problems with socioeconomic and cultural aspects that caused delays in finally receiving timely and proper obstetric care. The findings could provide more comprehensive inputs for district-based planning and policy.

4.9 Other Ministry of Health programmes related to maternal death review

Besides the MPA programme and the seven specific studies above, there are other activities related to MDR in Indonesia. These are mainly medical audits in hospitals, and a plan for death registration. While the MPA programme is under the supervision of the Directorate General Community Health, the medical audit is under the supervision of the Directorate General Medical Services, and the future death registration programme is under the supervision of the National Centre for Health Research and Development in the MOH. MDRs in hospitals are not yet done regularly, despite the decree for this activity in 2005 by the Minister of Health. The presence of an internal audit in a hospital is required for its accreditation. Since 2009, as part of a programme
for Mother and Baby Friendly Hospitals, an MPA is required. However, there is no standard structured instrument for the audit process. It has been suggested to use the word “review” rather than “audit”. The National Centre for Health Research and Development is planning to implement nationally death registration and cause of death, which will use a relatively simpler verbal autopsy form than the one used for MPA.

5. Discussion

Maternal mortality in Indonesia has declined over time. However, it remains relatively high especially compared to countries in South-East Asia such as Thailand and Sri Lanka. Since 1997, Indonesia has implemented and institutionalized an audit/review of individual maternal deaths through the maternal and perinatal morbidity and mortality audit nationally and at district level. However the level of implementation varies between districts and provinces and is not well documented.

The current study revealed many constraints and barriers for the implementation of the MPA, although there were also several facilitating factors. The problems encountered are likely to be similar to other countries that have tried to implement a nationwide MDR by any method. These include the absence of well-planned infrastructure, training/facilitators to start off the activity, systematic monitoring and evaluation and, most importantly, the difficulty in getting complete and reliable information on maternal deaths. This is especially true for MPAs in which information and reports need to be transmitted from the local to the district and central levels. For example, some reports had case descriptions with no recommendations. Even the case description is often incomplete, leading to an inability to identify the factors that contributed to the death, especially information that can throw light on the three delays.

The MPA, by having both maternal and perinatal deaths in its scope, may differ from similar initiatives in other countries where these deaths are audited separately, mainly because of different magnitudes, e.g. where perinatal deaths outnumber maternal deaths and may therefore require a sample for audit. Indeed, in the MPA in Indonesia, even maternal deaths for audits were selected from the total number reported.

As expected of any nationwide programme or initiative, especially for a country as big and diverse as Indonesia, some provinces and districts are better able than others to implement the programme. As was revealed by interviews with stakeholders of the MPA, the level of implementation was dependent largely on the commitment of the local authorities, especially for allocating budget for not only the MPA, but for maternal and child health in general. Local governments need to put United Nations Millennium Development Goals 4 and 5 as a top priority. The study also highlighted a well-known fact – that to prevent a maternal death, collaboration and active participation from other sectors is necessary; and this was also true for the MPA itself, in which the roles of the different relevant sectors had been identified on the road towards each maternal death audited.

Also, the findings and maternal death profiles of the MPA and the seven studies reviewed were as expected: maternal deaths occur more frequently among women
who are poor, marginalized and/or excluded from access to health care, and among those who have cultural beliefs and views that are harmful.

The lack of confidentiality has been cited as a main reason for poor motivation among midwives who report and investigate maternal deaths, and who may as a result avoid making reports or submit incomplete reports. While this is true, and has been experienced in many other countries, it has to be recognized that, even if confidentiality is a feature (such as in CEMD), it is not always guaranteed. Even then, the midwife presenting the case to the audit committee may have anxiety and fear, whether founded or unfounded, of being blamed. Thus it is critical that any national MDR programme, from the outset, explains to all midwives and other health personnel managing maternal health care that an MDR is not for punitive purposes, but a purely fact-finding exercise to identify factors that can prevent future deaths in similar circumstances.

It was very encouraging that the authorities were open to review and revision to make the MPA perform better, and that it was revised following the study conducted in West Nusa Tenggara to incorporate confidentiality. This is “good practice” that can potentially be followed by other countries that wish to embark on an MDR but are unable to establish CEMD from the beginning. Countries may also note that for this revision to happen, the study in West Nusa Tenggara had to be followed by another study in a “real” setting in Lombok. The enthusiasm of the health personnel at all levels on adopting CEMD in the MPA programme was high, as it relates to the weaknesses they had encountered.

Besides the element of confidentiality, the new features of more comprehensive forms for data collection, structured forms to assess or review cases, and the strategy to assess cases where the person involved in providing care does not have to be present and judged at the meeting, are additional potential strengths of the audit system. Needless to say, this revision will require inputs such as capacity-building. It is expected that once these preparations are finished, the revised programme could be officially launched at the national level, although some provinces and districts are already implementing it.

The experiences of eight separate studies related to MDRs reviewed by this exercise have shown that a national programme such as the MPA can benefit from the findings of such studies, whether deliberately planned to be linked to the MPA (West Nusa Tenggara and Serang district studies) or carried out independently as in the TRACE study.

The fact that other programmes carried out by the MOH, especially clinical audits in hospitals, can supplement and complement the MPA programme, is a feature common to all countries. In almost all countries, hospitals are required to do an internal audit particularly for deaths such as maternal deaths, as a quality of care component. In Indonesia, this was strengthened by the decree in 2005 by the Minister of Health. Also the fact that the audit is used as criteria for accreditation and ranking of a hospital, as well as for designation as a mother-and-baby friendly hospital, will strengthen the management of the hospital to carry out the audit.
With these several initiatives for MDR, it is possible and desirable that in future MDR in Indonesia will take an integrated approach, in which the revised MPA will incorporate or align itself to other audits.

Finally, while MDR activities and programmes such as the MPA are part of the wide scope of activities for reducing maternal mortality, it is especially important in measuring the magnitude of this mortality, especially to supplement existing methods of MMR estimation. Besides this quantitative aspect, it also contributes to the qualitative aspect of improving maternal health and survival by preventing further deaths.

6. Recommendations

• The MPA to improve its reporting and recording for a more complete identification of maternal deaths and, for this, coordination and linkage with the system of death registration is useful and should be pursued.

• The revised MPA to be optimally implemented and further evaluated after a period of time to judge its effectiveness.

• Efforts should be made to strengthen the clinical audits in hospitals and to integrate or at least link these to the revised MPA.

• The MPA as a form of MDR contributes directly to overall maternal health and survival and, along with other approaches, needs to be given due priority. Thus local and central governments should invest more resources in it.

• Monitoring and evaluation of the MPA programme should be done, including steps and indicators as per the guidelines.

7. Conclusions

The nationally driven MPA programme, implemented at district level, is the only – and prominent – initiative for MDR in Indonesia. Several studies have provided useful information for MDR, including some that either evaluated the MPA or were conducted to improve the programme. The revised MPA can benefit from other programmes of the MOH, especially clinical audits in hospitals.
8. References


D’Ambruoso et al. Extending Verbal Autopsy to investigate biomedical and socio-cultural causes of maternal death in Indonesia. Analysis of this study used Inter VA-M model. 2010.


### Annex 1.

Sample questionnaire for in-depth interview on maternal death review in Indonesia

**Location:** Ministry of Health Indonesia

<table>
<thead>
<tr>
<th>INFORMANT IDENTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFORMANT</td>
</tr>
<tr>
<td>POSITION</td>
</tr>
<tr>
<td>DATE OF INTERVIEW</td>
</tr>
<tr>
<td>TIME</td>
</tr>
<tr>
<td>INTERVIEWER</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Probing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>What kind of audit programme (include maternal audit) has been done in MOH apart from MPA?</td>
<td>Note: if the answer is other programme than MPA, continue with MPA history. Is there anything else?</td>
</tr>
<tr>
<td>2.</td>
<td>What is the relation between the audit and MPA?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>3.</td>
<td>Is there any basis of policy to conduct the audit programme?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>4.</td>
<td>Since when is the policy being implemented?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>5.</td>
<td>What are the barriers in implementation of the activity?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>6.</td>
<td>What are supporting factors in implementation of the activity?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>7.</td>
<td>Lesson learnt</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Since when is MPA being implemented in Indonesia?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>9.</td>
<td>What is the basic policy at national level to conduct MPA?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>10.</td>
<td>What is the mechanism of MPA activity?</td>
<td>Could you please tell us more?</td>
</tr>
<tr>
<td>11.</td>
<td>Can the province develop its own MPA according to its capability?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>No.</td>
<td>Question</td>
<td>Probing</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>12.</td>
<td>What is MPA coverage activity at district level in each province during early implementation?</td>
<td>Is it in phases in some provinces? Or is it being implemented in all provinces? How is the implementation at district level in those provinces? Is there anything else?</td>
</tr>
<tr>
<td>13.</td>
<td>What kind of barriers were found from implementation of the MPA?</td>
<td>Completeness of maternal death report? Cases selected for MPA? Blaming, naming, shaming? Budget? Central or local contribution? Frequency of activity related to budget from national or local revenue? Is there anything else?</td>
</tr>
<tr>
<td>14.</td>
<td>How is the result from MPA (recommendation) being used?</td>
<td>As input for planning? Supervision? Basis of advocacy? Is there anything else?</td>
</tr>
<tr>
<td>15.</td>
<td>How is feedback from the MPA process and result delivered to central level?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>16.</td>
<td>How is the collaboration with Basic Health services Directorate for maternal death in the hospital?</td>
<td>In community level, for cases selected for MPA, is there any collaboration with other sectors such as Family Planning Board, Statistic or Ministry of Home Affairs? From existing reporting, do you think it is underestimated or it covers all? Is there anything else?</td>
</tr>
<tr>
<td>17.</td>
<td>What are supporting factors in implementation of MPA?</td>
<td>Source of funds? Commitment? Is there anything else?</td>
</tr>
<tr>
<td>18.</td>
<td>Lesson learnt from old MPA?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td><strong>MPA revision</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>What is the basis of the policy to change old MPA to MPA revision?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>No.</td>
<td>Question</td>
<td>Probing</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>21.</td>
<td>How is the response of the province or district of MPA revision being socialized?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>22.</td>
<td>What are the barriers in implementation of MPA revision?</td>
<td>Funding, trainer since they will have to pass the training for the new forms and new system? Is there anything else?</td>
</tr>
<tr>
<td>23.</td>
<td>What are the supporting factors in implementation of MPA revision?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>24.</td>
<td>How is the legal aspect (including support from Minister’s decree, Governor and head of district) of data reviewed in MPA revision?</td>
<td>Is there anything else?</td>
</tr>
<tr>
<td>25.</td>
<td>Expectations, suggestions, ideas?</td>
<td>Is there anything else?</td>
</tr>
</tbody>
</table>

THANK YOU.
### Annex 2.

**Tool for focus group discussion with midwives on maternal death review in Indonesia**

Location: ........................................

<table>
<thead>
<tr>
<th>PARTICIPANTS:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

| DATE OF INTERVIEW | ________________, ___/___/2010 |
| TIME            | ____:____ -- ____:____ |

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Probing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>What do you know about MPA?</td>
<td>- History</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Background</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Aim/purpose</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Is it done to find the cause of death?</td>
</tr>
<tr>
<td>2.</td>
<td>What is your role in MPA implementation?</td>
<td>- Perception of roles as midwife in primary health care (puskesmas) setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Perception of roles as practising midwife.</td>
</tr>
<tr>
<td>3.</td>
<td>What is the definition/classification of maternal death?</td>
<td>- Describe the definition clearly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Is death of a woman cause by abortion or ectopic pregnancy included in this category?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- What about death cause by molar or hydatidiform pregnancy?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Is death in a pregnant woman caused by TB/dengue fever/typhoid included in this category?</td>
</tr>
<tr>
<td>4.</td>
<td>Do you think that maternal death reporting and recording is important?</td>
<td>- If ‘Yes’, why is it important?</td>
</tr>
<tr>
<td>5.</td>
<td>Who is the responsible person for maternal death reporting and recording?</td>
<td>- PHC?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Maternity clinics?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Private and/or public hospital?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The community?</td>
</tr>
<tr>
<td>No.</td>
<td>Question</td>
<td>Probing</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 6.  | Has maternal death reporting and recording already been executed well enough all this time? | - Strengths  
- Weaknesses  
- Does the reporting and recording system involve other institutions such as BKKBN, RT/RW, Kelurahan? |
| 7.  | Are there any difficulties in completing the MPA forms?                  | - The questions are not to the point  
- The questions are not clear  
- Too many questions  
- Other. |
| 8.  | Are the questions in the instrument complete enough to help determine the cause of death? | - If the answer is ‘No’, state all the questions that need to be added. |
| 9.  | Are there any difficulties in finding data that were needed to complete the instruments? | - Data from hospital  
- Data from PHC  
- Data from private maternity clinic  
- Data from community. |
| 10. | Critics/suggestions/inputs regarding MPA instruments?                    | - Structure  
- Composition  
- Completeness  
- Other. |
| 11. | Are all maternal deaths being audited?                                   | - Maternal death at PHC/hospital/community? |
| 12. | What is your opinion of the strengths and weaknesses of MPA implementation? | - Benefit  
- Easy to be implemented, in view of its time and funding  
- Can be used to determine the cause of death  
- Preparation and process  
- Completeness of data  
- Blaming atmosphere. |
| 13. | Is there any advice you can give to improve and/or strengthen the implementation of the MPA? | - Frequency  
- Composition/number of reviewers  
- Follow-up  
- Other. |
<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Probing</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.</td>
<td>Is there any lesson that can be learnt from this current MPA implementation?</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>What is your role as a health-care professional in your area?</td>
<td>- What are your responsibilities?</td>
</tr>
<tr>
<td>16.</td>
<td>With that kind of responsibilities, how can you manage to implement the MPA?</td>
<td>- Do you have enough time?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- What about the quality of the MPA implementation?</td>
</tr>
</tbody>
</table>

**Perception of role as a health-care giver**

**Revised MPA**

| 17. | Are you aware of any revision being done to this current MPA?             |  - If the answer is ‘Yes’, continue to the next question.                |
|     |                                                                          |  - If the answer is ‘No’, stop here and no need to elaborate.            |
| 18. | How far is the implementation?                                            |  - It was just being advocated.                                          |
|     |                                                                          |  - It was already being implemented.                                    |
| 19. | What is the response of the midwives in general against the revised MPA?  |  - Easy                                                                  |
|     |                                                                          |  - Hard                                                                  |
|     |                                                                          |  - Other.                                                                |
| 20. | What is extent to which Birth Preparedness and Complication Readiness (generally called P4K) programme is implemented? |  - Pasting the sticker                                                  |
|     |                                                                          |  - Implementation.                                                      |
| 21. | How can the revised MPA be linked to P4K?                                 |                                                                                        |
| 22. | Expectations, suggestions, ideas?                                        |                                                                                        |

TERIMA KASIH.
A study on the implementation of maternal death review in Indonesia
The maternal mortality ratio universally used to track Millennium Development Goal No. 5 – to reduce maternal mortality and improve maternal health – is only a quantitative measure and is not sufficient to prevent maternal deaths. To understand the circumstances that lead to, or contribute to these deaths, a maternal death review (MDR) or audit is needed. The World Health Organization guide “Beyond the numbers: reviewing maternal deaths and complications to make pregnancy safer” (2004) describes the methods of the MDR. Countries of the South-East Asia Region have been implementing MDRs using any combination of these methods to varying extents.

This study on the implementation of MDRs was conducted in five countries in the Region, namely India, Indonesia, Myanmar, Nepal and Sri Lanka. Each study was carried out with the same general aim to ascertain the level of MDR implementation (in any form or by any method) in the country, to strengthen the MDR as necessary, and to assist countries in building on their experiences to move towards maternal death surveillance and response.

While the MDR was being implemented in each of the five countries, the form it took and the magnitude of implementation varied. In general, these studies recommend that the respective countries strengthen the management of the current MDR programme, and address the weaknesses identified, including strategies to raise the awareness of policy-makers and members of the community on the importance of MDR.
Study on the implementation of maternal death review in five countries in the South-East Asia Region of the World Health Organization

Regional overview
# Table of Content

Acknowledgements................................................................................................................. v
Abbreviations........................................................................................................................ vi
Preface ....................................................................................................................................... viii
Executive summary.................................................................................................................... ix
Message from Regional Director............................................................................................... xi
1 **Introduction** .......................................................................................................................... 1
2 **Background** ........................................................................................................................ 1
   2.1 Maternal mortality in the South-East Asia Region................................................................. 1
   2.2 Maternal death review – a brief overview.............................................................................. 3
   2.3 Maternal death review in the South-East Asia Region............................................................ 4
3 **The study in five countries – rationale, objectives and methodologies** ............................ 6
   3.1 Rationale ............................................................................................................................ 6
   3.2 Objectives .......................................................................................................................... 7
   3.3 Methodologies .................................................................................................................... 8
4 **Findings** ............................................................................................................................... 8
   4.1 Maternal death review initiatives and scope ....................................................................... 8
   4.2 Organization, institutionalization and processes ................................................................. 10
   4.3 Extent of implementation..................................................................................................... 10
   4.4 Methods of audit used ........................................................................................................ 11
   4.5 Use of maternal death review findings for action and outcomes ....................................... 12
   4.6 Strengths and opportunities ................................................................................................. 13
   4.7 Weaknesses and challenges .............................................................................................. 14
   4.8 Future directions ................................................................................................................ 16
5 **Discussion** ........................................................................................................................ 16
   5.1 Methodologies ................................................................................................................... 16
   5.2 Scope ................................................................................................................................. 16
   5.3 Methods ............................................................................................................................. 18
   5.4 Stakeholders ....................................................................................................................... 19
   5.5 Maturity of programmes ................................................................................................... 19
   5.6 Leadership .......................................................................................................................... 20
   5.7 Impact ................................................................................................................................. 20
Acknowledgements

A former Regional Adviser for Maternal and Reproductive Health in the World Health Organization Regional Office for South-East Asia, Dr Ardi Kaptiningsih, commissioned researchers in five countries of the Region in 2010 to conduct a study on the implementation of maternal death reviews in these countries. The Regional Office would like to express its appreciation to these researchers: Dr Suzie Francis (India), Dr Asri Adisasmita (Indonesia), Dr Theingi Myint (Myanmar), Dr Sharad Sharma (Nepal) and Dr Kapila Jayaratne (Sri Lanka). The individual reports submitted by these researchers, edited and reformatted by the incumbent Regional Adviser for Maternal and Reproductive Health, Dr Narimah Awin and the Medical Officer for Making Pregnancy Safer, Dr Arvind Mathur, are presented separately.
# Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMW</td>
<td>auxiliary midwife</td>
</tr>
<tr>
<td>BCC</td>
<td>behaviour change communication</td>
</tr>
<tr>
<td>CEMD</td>
<td>confidential enquiry into maternal deaths</td>
</tr>
<tr>
<td>CI</td>
<td>confidence interval</td>
</tr>
<tr>
<td>CRMD</td>
<td>confidential review of maternal deaths</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>Democratic People’s Republic of Korea</td>
</tr>
<tr>
<td>ENC</td>
<td>essential newborn care</td>
</tr>
<tr>
<td>FHB</td>
<td>Family Health Bureau</td>
</tr>
<tr>
<td>FOGSI</td>
<td>Federation of Obstetricians and Gynaecologists, India</td>
</tr>
<tr>
<td>ICD</td>
<td>International Classification of Disease</td>
</tr>
<tr>
<td>ICU</td>
<td>intensive care unit</td>
</tr>
<tr>
<td>IEC</td>
<td>information, education and communication</td>
</tr>
<tr>
<td>IPHA</td>
<td>Indian Public Health Association</td>
</tr>
<tr>
<td>MAPEDIR</td>
<td>maternal and perinatal death inquiry response</td>
</tr>
<tr>
<td>MCH</td>
<td>maternal and child health</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>MDR</td>
<td>maternal death review</td>
</tr>
<tr>
<td>MDSR</td>
<td>maternal death surveillance and response system</td>
</tr>
<tr>
<td>MMEIG</td>
<td>Maternal Mortality Estimation Inter-agency Group</td>
</tr>
<tr>
<td>MMR</td>
<td>maternal mortality ratio</td>
</tr>
<tr>
<td>MO-MCH</td>
<td>Medical Officer of Maternal and Child Health</td>
</tr>
<tr>
<td>MPA</td>
<td>maternal and perinatal (mortality and morbidity) audit</td>
</tr>
<tr>
<td>MPDR</td>
<td>maternal and perinatal death reviews</td>
</tr>
<tr>
<td>NGO</td>
<td>nongovernmental organization</td>
</tr>
<tr>
<td>NMPDRC</td>
<td>National Maternal and Perinatal Death Review Committee</td>
</tr>
<tr>
<td>NRHM</td>
<td>National Rural Health Mission</td>
</tr>
<tr>
<td>RCH</td>
<td>reproductive and child health</td>
</tr>
<tr>
<td>SAMM</td>
<td>severe acute maternal morbidity</td>
</tr>
</tbody>
</table>
Preface

This study on the implementation of maternal death review/audits (MDR), supported by the WHO Regional Office for South-East Asia (SEARO), was conducted in five countries in the Region, namely India, Indonesia, Myanmar, Nepal and Sri Lanka. MDRs have also been conducted to varying degrees in the other six Member States of the Region, as is evident from the reports of the series of workshops and meetings conducted or supported by SEARO between 2003 and 2009.

While the objectives and, to some extent, the methodologies used in these studies were similar, the MDR initiatives selected by the researchers showed some variations. All of them reported on at least one MDR initiative carried out at the national level, and some also reported on other MDR initiatives. However, the findings, conclusions and recommendations used different formats and styles. To ensure some degree of uniformity, each report was therefore edited and reformatted at the Regional Office. The individual country reports are presented using a common format consisting of seven sections – Introduction, Background, Objectives and Methodology, Findings, Discussion, Recommendations and Conclusions. The same format is used to present the synthesis of the studies in this regional overview of the study.

In addition, with a view to presenting a harmonized document, information that cuts across all countries, such as background on maternal mortality and MDRs, has been reduced, leaving each report to focus on the substantive content of its MDR.

The status of implementation of MDRs for the five countries studied is presented in the Introduction of each country report as statements taken verbatim from the Regional Workshop on Strengthening Capacity for Facility-based Maternal Death Reviews, held in 2007. The status of MDRs being implemented in all 11 countries of the South-East Asia Region is summarized in the Background section of this document.
Executive Summary

The maternal mortality ratio (MMR) universally used to track the Millennium Development Goal (MDG) No. 5 – to improve maternal health – is only a quantitative measure and is not sufficient to design strategies to prevent maternal deaths. To understand the circumstances that have led or contributed to these deaths, a maternal death review (MDR) or audit is needed. The World Health Organization Regional Office for South-East Asia (SEARO) provided countries of the Region with technical support to conduct such MDRs, which are now being implemented. Information on the extent of this implementation is not complete, but there is reason to believe that it requires strengthening or scaling up in all countries.

Objectives and methodologies: A study on the implementation of MDR was conducted in five countries in the Region, namely India, Indonesia, Myanmar, Nepal and Sri Lanka. Each study was carried out with the same general aim to ascertain the level of MDR implementation (in any form or by any method) in the country. The specific objectives, although expressed differently in each study, were essentially to (i) elicit information on the implementation of MDR in the country, (ii) document the experiences of MDR initiatives being implemented, including follow-up actions, (iii) recommend strategies to strengthen and institutionalize MDRs, and (iv) draw lessons and share experiences among the five participating countries, and with other countries in the Region. With minor differences, these studies used common methodologies including a review of documents and reports; since the study needed to elicit the experiences of various stakeholders, it was largely qualitative using surveys that relied on interviews and observations.

Findings and discussion: All five countries have initiated the MDR as a national programme. Some, such as Myanmar, were still in a pilot phase, while in Sri Lanka it has been established for nearly three decades and is implemented nationwide. The MDR in India is only implemented in a few states, but is well established in Kerala and Tamil Nadu. Some MDRs were a combination of maternal and perinatal death reviews (Indonesia and Nepal) or maternal with neonatal death reviews (Myanmar). Besides the national MDRs, other levels of MDR exist except in Sri Lanka where there is a single unified system for the whole country, and in Myanmar where the national MDR is complemented only by clinical case studies by an obstetrician. In India, four major initiatives were included in this study, while in Indonesia and Nepal, efforts were in the form of relatively small time-limited studies.

There were clear organizational and managerial arrangements for the national MDRs, with Sri Lanka reporting the most organized and structured. As expected, there was considerable variation in the implementation of MDRs at different levels in all five countries, especially in the two large and diverse countries, India and Indonesia. The methods used to conduct the MDR vary from country to country, consisting of facility- and community-based reviews, using mainly verbal autopsy, with confidentiality assured enquiries conducted in Sri Lanka and Kerala, India. Clinical reviews in hospitals are also conducted in some countries.
In all five countries, the findings from the MDR have been used to design or change policies and strategies for improvement of services. The strengths identified in this study include a fairly long history and evolution (as in Sri Lanka, Kerala and Tamil Nadu, India); strong managerial and organizational arrangements including committees and review teams; guidelines for implementation; commitment of senior staff; positive response from community leaders; high motivational level of concerned staff when they realize that their efforts have led to positive changes. The major weaknesses identified were the difficulty of getting complete information on reported deaths, and under-reporting of deaths. Other problems are poor planning; limited resources; poor skills of staff; demotivated staff, especially in fear of possible punitive action; and negative attitudes and perceptions of certain health staff. In some cases, the design and approach of the MDR itself were found to pose difficulties, such as inappropriate reporting forms.

**Conclusion and recommendations:** Overall in the five countries, MDRs are being implemented, but the form they take and the extent of implementation differ, each having its own strengths and weaknesses. In general, it is recommended that the respective countries strengthen the management of their current MDR programme and address the weaknesses identified, including strategies to raise the awareness of policy-makers and members of the community on the importance of MDR.
Message from Regional Director

MDG5 to improve maternal health directly addresses the reduction of maternal mortality by 2015. It is gratifying to note that worldwide, the maternal mortality ratio (MMR) declined from 400 in 1990 to 260 in 2008 – a 34% decline with an annual drop of 2–3%. MMR is largely a quantitative measure to see trends and track progress of MDG5. But knowing the magnitude of maternal mortality is not enough to prevent further deaths. Understanding the underlying factors that led to these deaths will contribute to designing and taking remedial measures. Therefore an investigation through a maternal death review (MDR) of all, or a sample of them is called for. Since every maternal death has a story to tell, uncovering the story will throw light on the causes, characteristics and circumstances of the death. Whether the death occurred in a hospital or at home, the causes should be explored, the avoidable factors, missed opportunities and substandard care identified, and evidence-based, corrective actions taken to improve the quality of services.

The WHO guide “Beyond the numbers: reviewing maternal deaths and complications to make pregnancy safer”, describes five methods of MDR. It is known that countries of the South-East Asia Region are implementing MDRs using a combination of these methods to varying extent. To further strengthen the MDR and assist countries in moving towards Maternal Death Surveillance and Response, it was deemed necessary to gain more knowledge on the exact situation in countries.

The report of the Commission on Information and Accountability established under the United Nations Global Strategy on Women’s and Children’s Health made three specific recommendations on improving information, which were especially relevant given the need to improve the reliability of MMR. Beyond attempting to derive more reliable MMR estimates, the World Health Organization (WHO) is making several efforts to respond to the report of the Commission. One such effort is to extend the MDR from a review of causes and circumstances into a more meaningful mechanism for surveillance and response.

Countries should strengthen the management of the current Maternal Death Review programme, using an optimal mix of facility-based and community-based reviews to ensure a more complete coverage. There is a need to build capacity of health staff to implement maternal death reviews and to respond to findings.
The WHO Regional Office for South-East Asia therefore supported five countries – India, Indonesia, Nepal, Myanmar and Sri Lanka – to conduct a study on implementation of their MDR, which commenced in 2011. The reports of these studies, along with a synthesised regional report, are now being shared with the different stakeholders in all countries of the Region and beyond.

Dr Poonam Khetrapal Singh
WHO Regional Director for South-East Asia
1. Introduction

A maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from incidental causes. This is to be differentiated from pregnancy-related death, which is the death of a woman while pregnant or within 42 days of termination of pregnancy irrespective of the cause of death (in other words, it includes incidental causes that are excluded from the definition of maternal death). A late maternal death is one that occurs after 42 days but before one year of termination of pregnancy.

The maternal mortality ratio (MMR) – the number of maternal deaths per 100 000 live births – is the universally used indicator for tracking Millennium Development Goal 5a (MDG5a) which calls for a three-quarter reduction of MMR between 1990 and 2015. This quantitative measure merely indicates the numerical magnitude of the problem; by itself it is not very useful to design strategies to prevent maternal deaths. To be able to do this, there is need to understand the circumstances that have led or contributed to the death. This has been aptly stated as “[e]ach maternal death or case of life-threatening complication has a story to tell”, and to uncover this story, a maternal death review (MDR), also referred to as a maternal death audit, is conducted. The need for qualitative as well as quantitative indicators is also captured by the title of the World Health Organization (WHO) guide, Beyond the numbers – Reviewing maternal deaths and complications to make pregnancy safer (2004).

The guide has been introduced in all countries of the South-East Asia Region (SEAR). The current document shares a study of implementation of MDR in five countries of the Region: India, Indonesia, Myanmar, Nepal and Sri Lanka.

2. Background

2.1 Maternal mortality in the South-East Asia Region

The status of maternal health varies among countries, and there is more than one source of data for calculating MMR. In an attempt to render these MMR data as comparable as possible, the Maternal Mortality Estimation Inter-agency Group (MMEIG) consisting of experts from four international agencies has generated estimates of MMR using a scientifically robust methodology every five years since 1990. Methods used by countries to estimate MMR include a national vital registration system (the “gold standard”); a sample registration system; national census data; and surveys and special studies. The MMEIG report on 2010 estimates categorized countries as:

(i) those with civil registration data characterized as complete, with good attribution of deaths (65 countries, none of which are from SEAR);

(ii) those lacking good complete civil registration data but where other sources of national data are available (88 countries, including nine from SEAR: Bangladesh, Bhutan, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka and Thailand); and
(iii) those with no national data on maternal mortality (27 countries, including the Democratic People’s Republic (DPR) of Korea and Timor-Leste from SEAR).

It is important to note that MMR estimates are often different from the original national data reported by countries, and this has led to questions about accuracy and reliability. A critical point is that any estimate of MMR – whether the nationally generated figure or the figure adjusted by modelling by the MMEIG or any other source – is likely to be less reliable and accurate than desired. MMR is a notoriously difficult health statistic to measure. Therefore the MMEIG also reports the range of confidence interval (CI) limits, within which the national figure generally falls, although it is of course expected to be very wide with a low level of precision.

In making the estimates for 2010, the MMEIG reviewed and adjusted its previous estimates (1990, 1995, 2000, 2005) in the light of new and updated information. These time trends are useful for measuring progress of MDG5a, which requires at least an annual reduction of 5.5%. The estimates for SEAR for the five-year benchmark periods between 1990 and 2010 are shown in Table 1.

Table 1. Trend of maternal mortality in the South-East Asia Region, 1990–2010

<table>
<thead>
<tr>
<th>Country</th>
<th>MMR (adjusted)</th>
<th>MMR 2010 (No. of deaths)</th>
<th>% reduction (% per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1990</td>
<td>1995</td>
<td>2000</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>800</td>
<td>560</td>
<td>400</td>
</tr>
<tr>
<td>Bhutan</td>
<td>1,000</td>
<td>670</td>
<td>430</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>97</td>
<td>140</td>
<td>120</td>
</tr>
<tr>
<td>India</td>
<td>600</td>
<td>480</td>
<td>390</td>
</tr>
<tr>
<td>Indonesia</td>
<td>600</td>
<td>420</td>
<td>340</td>
</tr>
<tr>
<td>Maldives</td>
<td>830</td>
<td>390</td>
<td>190</td>
</tr>
<tr>
<td>Myanmar</td>
<td>520</td>
<td>380</td>
<td>300</td>
</tr>
<tr>
<td>Nepal</td>
<td>770</td>
<td>550</td>
<td>360</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>85</td>
<td>74</td>
<td>58</td>
</tr>
<tr>
<td>Thailand</td>
<td>54</td>
<td>54</td>
<td>66</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>1,000</td>
<td>880</td>
<td>610</td>
</tr>
<tr>
<td>SEA Region</td>
<td>590</td>
<td>460</td>
<td>370</td>
</tr>
</tbody>
</table>


The regional annual reduction at 5.2% is just short of the required 5.5% to achieve MDG5a in 2015 but with a slight surge of efforts, it is likely that SEAR will achieve this goal. However, this average does not portray the full picture as there are significant disparities among countries. Remarkable progress (with more than 5.5% annual reduction) has been made by Bangladesh, Bhutan, India, Nepal, Maldives and Timor-Leste, but the percentage for the Maldives, given the small number of deaths, is subject to fluctuation. Three countries have MMR below 100 where further reduction will not be easy to achieve – DPR Korea, Sri Lanka and Thailand. For Timor-Leste, even though the percentage reduction was better than the required 5.5%, the country is still in the category of “high MMR” defined as above 300.
2.2 Maternal death review – a brief overview

The system of confidential enquiry into maternal deaths (CEMD) was instituted in the United Kingdom as early as 1928, but became formalized with the first triennial report in 1952–1954. CEMDs are now carried out routinely in many countries like Australia, Israel, Jamaica, Malaysia and South Africa, and therein lies the paradox: it is institutionalized in countries with low MMR, yet remains to be introduced in high-burden countries. More recently it was introduced in Egypt and Indonesia (this study traced the development of CEMD in the latter). Sri Lanka, as this study will demonstrate, started confidentiality assured maternal death review in the 1980s. Efforts are undertaken to incorporate severe acute maternal morbidity (SAMM) or near-miss cases to enable sufficient cases from which lessons can be learnt, since the number of maternal deaths is relatively small. In 2011, support was given by SEARO to Maldives to introduce audits of SAMM or near-miss cases and perinatal deaths.

The CEMD is relatively sophisticated and requires a degree of organization and resources. There are other methods of MDR. Basically, the audit can be in a facility or in the community, or both; and sources of information can be records/documents or interviews (verbal autopsy). The CEMD has the added feature of confidentiality. In addition to deaths, the audit may include SAMM or near-misses. In the WHO guide Beyond the numbers, five methods are described that take these into account.

i) **Community-based maternal death reviews (verbal autopsies):** This is a method of finding out the medical cause(s) of death and ascertaining the personal, family or community factors that may have contributed to the deaths of women outside of a medical facility. The verbal autopsy identifies such deaths in the community and consists of interviewing people such as family members, neighbours and traditional birth attendants who may be knowledgeable about the events leading to the death. It may also be used to identify contributing factors for deaths occurring in a health facility.

ii) **Facility-based maternal death reviews:** This method consists of a qualitative, in-depth investigation of the causes and circumstances surrounding maternal deaths occurring at health facilities. Although the death occurred at the facility, such reviews also attempt to identify any combination of factors at the facility and in the community that contributed to the death, and those that may have been avoidable.

iii) **Confidential enquiries into maternal deaths:** These comprise systematic, multidisciplinary, anonymous investigations of all or a representative sample of maternal deaths occurring in an area, i.e. at regional (state) or national level. They identify the numbers, causes and avoidable or remediable factors associated with maternal deaths. Using the lessons learnt about each woman’s death and the aggregated data, the confidential enquiries provide evidence of where the main hurdles to overcoming maternal mortality lie, and recommend what should be done in practical terms. This includes key areas for health sector and community action, and guidelines to improve clinical outcomes.
iv) *Surveys of severe morbidity (near-misses)*: These relate to the identification and assessment of cases in which pregnant women survive obstetric complications. This is defined as any woman who is pregnant, or has delivered or terminated her pregnancy within the previous six weeks, in whom immediate survival is threatened or who survives by chance or because of the hospital care received.

v) *Clinical audit*: A quality-improvement process that seeks to improve patient care and outcomes through a systematic review of aspects of the structure, processes, and outcomes of care against explicit criteria and the subsequent implementation of change.

The key messages in the WHO guide offer an excellent summary of the philosophy and principles of a maternal death review:

- Avoiding maternal deaths is possible, even in resource-poor countries, but it requires the right kind of information on which to base programmes.
- Knowing the level of maternal mortality is not enough; the underlying factors that led to the death need to be understood.
- Each maternal death or case of life-threatening complications has a story to tell and can provide indications on practical ways of addressing the problem.
- A commitment to act upon the findings of these reviews is a key prerequisite for success.

While the terms “review” and “audit” are synonymous, the term “audit” is often perceived as judgemental with an undertone of punitive, yet unintended intent. An MDR has no punitive purpose; rather it is a fact-finding exercise to identify factors that can prevent future deaths in similar circumstances. In CEMD, specific approaches are adopted to ensure the anonymity of the health-care providers involved. On the other hand, the identity of the deceased cannot be completely anonymous, despite all efforts, since certain pertinent demographic variables – such as socioeconomic status, residence or ethnicity – will suggest from which area and even which hospital the case is reported and may therefore even compromise the anonymity of the health provider.

2.3 **Maternal death review in the South-East Asia Region**

With technical support from WHO, the guide *Beyond the numbers* has been introduced in all SEAR countries. Training, workshops and individual support have been provided to some countries and the following workshops on MDR have been convened:

i) **Intercountry Meeting on Improvement of Quality Maternal Health Services through Maternal Death Reviews**, New Delhi, January 2003. Four countries participated – Bangladesh, Bhutan, India and Indonesia – and designed projects on MDR.

ii) **Regional Informal Consultation on Maternal Death Reviews**, Gurgaon, January 2006, to review the four country projects listed above. The consultation was also attended by other SEAR countries.
Regional Workshop on Strengthening Capacity for Facility-based Maternal Death Reviews, Bangkok, September 2007, to strengthen capacity to analyse findings of facility-based MDR. All countries except Timor-Leste participated.

While WHO has provided technical support to all countries in their implementation of MDR, the extent of implementation, approaches, strengths, weaknesses and outcomes has differed. The efforts of the five countries of this study, detailed in the respective country reports, are briefly summarized below:

**India:** the methods practised in different areas of India vary. These include facility-based reviews and community-based verbal autopsies, and confidential enquiry.

**Indonesia:** the Maternal and Perinatal Audit (MPA), a community-based verbal autopsy by midwives, launched in 1997, is yet to be implemented in all districts.

**Myanmar:** community-based verbal autopsy and facility-based maternal and perinatal death reviews (MPDR) have been initiated in five townships as pilot projects since January 2007.

**Nepal:** a WHO-supported maternal perinatal death review MPDR was initiated in 2003 in 6 hospitals, and covered 12 hospitals by 2011.

**Sri Lanka:** since 1985, all maternal deaths are required to be notified and investigated through field and facility-based reviews. The analysis of maternal deaths produced vast information related to causes of death, place, time, type of delays and other related factors.

The situation in 2007 for five other SEAR countries is summarized below, based on extracts from the report of the Workshop on Strengthening Capacity for Facility-based Maternal Death Reviews, New Delhi, September 2007. Timor-Leste did not participate in this workshop.

**Bangladesh:** The community-and facility-based MPDR are derived from the WHO guide. A project-based initiative that began in March 2007 involves medical college hospitals, four district hospitals, four upazilla health complexes (UHC) and three unions of each UHC. The initiative included the development of notification and review forms; formation and orientation of death review teams at different levels (districts and upazilla MDR committees, the Obstetrics and Gynaecology Society’s technical committees, and the National Technical Committee for MPDR); and establishment of linkages between referral health facilities and the community through the death notification and review mechanisms. Harmful traditional practices and insufficient control over practices of the private health sector were listed among the factors impeding the monitoring of service quality. The weak health information system and under-reporting of cases of maternal deaths, especially those involving home deliveries, are other constraints. Knowledge and understanding of MPDR is limited as the process is new. There are plans for staff orientation, training and scaling up of actions to maintain the MPDR system.
**Bhutan:** Maternal death reporting was revitalized in 2001 with the formation of the MDR Committee. Two forms of a questionnaire were used to collect data for deaths occurring at home or in hospital. The process revealed that more deaths are occurring at home than in hospitals, and helped to learn about medical and social factors contributing to maternal deaths. The challenges include difficulties in identifying deaths in urban areas, under- and miss-reporting, incomplete review forms and under-utilization of data at all levels.

**DPR Korea:** The country’s extensive health-care system supports maternal health services; 89.5% of all deliveries are at the health facility and 10.5% at home. Of all deliveries, 98% are attended by skilled professionals. DPR Korea has presented a system of reporting and reviewing maternal and perinatal deaths. It was envisaged that MPDR within the WHO and Ministry of Public Health collaborative programme is strengthened by introducing confidential enquiries into maternal deaths, initially on a pilot basis.

**Maldives:** The review of all maternal deaths was carried out between 1998 and 2000, with the MDR Committee being formed in 1999. This was replaced in 2001 by the review of all maternal deaths as they occur, with immediate reporting to the Committee. In 2006 the process of review underwent modifications, adopting the methods of institutional (facility) and field (community) investigations.

**Thailand:** MDR has been undertaken with a gradual expansion of the scope since 1990 by two methods – case conference and confidential enquiry. The “three delay” model is used when conducting the analysis, and inputs used for improving clinical practices and quality of care (by updating guidelines, training and management systems). The lack of technical support and professional networking were stated as major constraints.

### 3 The study in five countries – Objectives and methodology

#### 3.1 Rationale

The current study to assess the implementation of MDR in five selected countries will form the basis for further technical assistance from SEARO to strengthen the countries’ capacity.

With the approach of 2015, the year to achieve the MDGs, countries need to accelerate their actions to lower the MMR to the targeted figure. Efforts are being made not only to reduce MMR, but also to improve the reliability of the figures. Along with this, efforts are being made to look “beyond these numbers” so as to understand the circumstances surrounding the death, by conducting MDRs. The Global Strategy for Women’s and Children’s Health launched by the United Nations Secretary-General in September 2010 adds importance and impetus to the MDG; the report of the Commission on Information and Accountability under this global strategy has
made several recommendations for better measurement and tracking of the health of women and children, including more accurate estimates of maternal and newborn mortality. The inability to measure reliably maternal health and maternal mortality contributes to a lack of accountability, which in turn impedes progress. Therefore the Commission has recommended that countries develop a maternal death surveillance and response (MDSR) system.

Although the exact scope and questions to be asked were not specified to the researchers of this study, answers to the following questions might be expected:

1. Has a maternal death review been started in the country? When and where?
2. What methods of MDR are being used?
3. What salient findings have been generated by these reviews?
4. Have there been reactions to the findings of these reviews?
5. What is the management and administrative arrangements for these reviews – policy statements, rulings, directives, guidelines, committee/task force (and membership) etc.?
6. What were the strengths and weaknesses/problems encountered?
7. Are the findings of these reviews widely disseminated/shared? Who are the recipients of the review reports? Have any review findings been published, e.g. in journals?
8. Has there been any response (positive or negative) from stakeholders – political figures, hospital administrators, doctors, public?
9. What are the future plans?

3.2 Objectives

The five studies were carried out with the same aim, generally to ascertain the level of the implementation of MDR in the country. The specific objectives were also the same as specified in the agreement with WHO. However, since these were expressed generically, i.e. not taking into account each country’s situation, the researchers adapted them without changing the intent of the study as envisioned by WHO. In essence, the specific objectives were:

1. to elicit information on the implementation of MDR in the country overall and at administrative levels such as province, state, and district as applicable;
2. to document the experiences of MDR initiatives being implemented, including the follow-up actions undertaken based on the findings of the MDR;
3. to recommend strategies for strengthening and institutionalizing MDR in the country; and
4. to draw lessons and share the country’s experience with other countries in the study and in the Region.
3.3 Methodologies

Because the MDR initiatives in the countries differ in approach and maturity, the methodologies used in the five studies were different, but with several common features. All relied heavily on review and examination of documents. Since the studies needed to find out the opinions of various stakeholders, these were largely qualitative with information obtained by interview using a questionnaire or observation with or without a checklist. The methodology used in each country is summarized below.

**India**: To determine the overall status of MDR implementation in the country, a short survey was conducted for stakeholders in all states. A national training workshop was convened by the National Rural Health Mission (NRHM), which was used as an opportunity to interview nodal officers from the states. In addition to this approach, the study reviewed four major MDR initiatives.

**Indonesia**: This study covered the one national institutionalized MDR, the MPA Programme. Several other studies on MDR, including some related to MPA, were known to the researcher and covered in the study. The main methodology employed was a desk review of documents, papers and reports, but a sub-study using interviews and focus group discussion was conducted in selected areas to gain the views and opinions of stakeholders.

**Myanmar**: This study was carried out in 10 of the 30 townships designated with essential newborn care (ENC) where the MDR by community-based verbal autopsy was introduced in December 2010. This uses a relatively simple methodology – a checklist to assess MDR implementation in health facilities, and a questionnaire for an interview with stakeholders. Findings from related studies and MDR initiatives were briefly reviewed.

**Nepal**: Four methodologies were used in the study: a review of the evolution of the formal MDR efforts based on documents and records; a desk review of published and unpublished articles and papers; an in-depth interview with stakeholders; and a two-day national workshop to analyse hospital-based MDR.

**Sri Lanka**: The methodologies used were an in-depth desk review of the literature (documents/reports/Internet search), stakeholder workshops and key informant interviews, focusing on the single unified community and facility-based review systems across the country.

4. Findings

The detailed and specific findings of the five individual studies, presented as separate reports, are collated and synthesized below.

4.1 Maternal death review initiatives and scope

It is to be borne in mind that, due to the constraint of resources, including time, the findings represent what the researchers were able to study. Overall, the studies
describe national MDR programmes; other initiatives that are not national were also described, except in Sri Lanka where only the country-wide community and facility-based review is assessed. The efforts and initiatives of nongovernmental organizations (NGOs), which are known to be implemented in some of the five countries, had not been selected by any of the researchers in this study. Table 2 summarizes the scope of MDR initiatives carried out in each study country.

**National initiatives**

In Sri Lanka, there is one unified system of reviewing maternal deaths through confidentiality assured community and facility-based reviews implemented throughout the country. In Indonesia and Nepal, there has been a formal system of auditing maternal deaths since the early 1990s, but this is limited to facility-based (mainly hospital) audits. In both countries, MDR incorporates perinatal death audits as well, and this is captured in the name of the programme and the review committee respectively, i.e. Maternal and Perinatal Audit programme in Indonesia, and the National Maternal and Perinatal Death Review Committee in Indonesia. In India, there is a national initiative and policy through the NRHM for all states to conduct MDR, although not all states have begun to implement this directive. In Myanmar, in 2005, a Maternal and Perinatal Death Audit was initiated in five townships of Sagaing Region. In 2009, this was expanded to cover 30 ENC townships. The scope of the audit covers both maternal and neonatal deaths.

**Other initiatives**

Besides the national initiatives, four countries had conducted other MDR initiatives, either in the public system at subnational level, as seen in India where Kerala and Tamil Nadu states implemented MDR before the directive from the NRHM. In India, there is also the Maternal and Perinatal Death Inquiry and Response (MAPEDIR) led and supported by UNICEF, which conducts death reviews for both maternal and perinatal deaths and makes recommendations for appropriate responses in selected pilot districts in the country. No similar subnational MDR activities exist in the other countries, but there have been several studies that by their nature were time-limited and, with few exceptions, not designed for long-term implementation. Some of these are hospital-based clinical audits, as in Safdarjang Hospital in New Delhi, India (which started as a pilot of core groups for developing national guidelines and is designed for long-term implementation), and two MDRs initiated by an obstetrician in Myanmar. Several such studies were also reviewed in Nepal. In Indonesia, at least seven similar studies had been conducted, some designed to assess and improve the national MPA programme, while others were independent of the MPA. In Sri Lanka, besides the unified nationwide confidentiality assured maternal death review system involving all levels of maternal health care providers, there is separate perinatal death audit system covering all specialised hospitals.
### Table 2. Maternal death review initiatives carried out in the five study countries

<table>
<thead>
<tr>
<th>Study/country</th>
<th>Maternal death review initiatives included in study</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>National MDR under NRHM</td>
</tr>
<tr>
<td></td>
<td>MAPEDIR</td>
</tr>
<tr>
<td></td>
<td>Kerala CEMD</td>
</tr>
<tr>
<td></td>
<td>Tamil Nadu facility-based MDR</td>
</tr>
<tr>
<td></td>
<td>Safdarjang Hospital facility-based review and clinical case audits</td>
</tr>
<tr>
<td>Indonesia</td>
<td>National maternal and perinatal audit</td>
</tr>
<tr>
<td></td>
<td>Seven time-limited studies from literature review</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Pilot maternal and neonatal death audit in 30 townships</td>
</tr>
<tr>
<td></td>
<td>Facility-based MDR in one hospital</td>
</tr>
<tr>
<td>Nepal</td>
<td>National maternal and perinatal death audit</td>
</tr>
<tr>
<td></td>
<td>Several time-limited studies from literature review</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Field and Institutional maternal death review across country</td>
</tr>
</tbody>
</table>

#### 4.2 Organization, institutionalization and processes

In all the MDR initiatives that are driven by government policies and directives, whether national or subnational, there are clear organizational and managerial arrangements. The most structured and organized is the MDR at field and facilities in Sri Lanka, implemented nationwide for nearly three decades and which has undergone gradual improvement and strengthening over the years. Nepal also reports a clear structure with a national committee that has clear terms of reference and holds regular (if infrequent) meetings. In Myanmar, although details of the organizational arrangements are not described, the assessment of the health facilities shows a clear structure, and members of the audit team are selected according to set criteria. The same applies to the MDRs in Kerala and Tamil Nadu states in India; the audit team in Kerala includes (and indeed was led by) the professional association of obstetricians. The organization in the Indonesia MPA follows a hierarchical structure and is implemented with standard procedures: the village midwife begins the process by identifying and reporting the maternal (and perinatal) death, and presents the information to the audit committee at district level.

#### 4.3 Extent of implementation

There is considerable variation in the implementation of MDR among levels (states, districts, health centres) in all the five countries, and this was most obvious in India and Indonesia. On the other hand, in Sri Lanka, implementation from the beginning of the system has been relatively uniform throughout the country involving all levels of field, hospitals, district and national stakeholders. Incremental strengthening of the system has also been carried out uniformly, including the mandatory notification of a maternal death since 1989. In Nepal, the system was planned for phased
implementation, beginning with a few hospitals, and has now been expanded to 16 hospitals. In Myanmar, the current initiative has not been extended throughout the country, and is still in the pilot phase in selected townships. In India, although there is a clear policy for MDR under the NRHM, implementation is only in selected states, which were identified during this study but not further studied. Of 28 states and union territories, only six (Gujarat, Karnataka, Kerala, Maharashtra, Rajasthan and Tamil Nadu) completely fulfilled the criteria set. This study did not cover any of these state-wide MDRs except to reveal that such efforts exist in these states, and that the MDR initiatives in the states of Kerala and Tamil Nadu are being implemented optimally.

4.4 Methods of review used

The methods used to conduct the MDR varied from country to country. In Sri Lanka, three of the five methods described in the WHO guide *Beyond the Numbers* are used, although the overall approach is the institutional MDR and a verbal autopsy by a field investigation. The institutional MDR incorporates a modified clinical audit. In Nepal, the national system only involves facility/hospital-based audits for both maternal and perinatal deaths, using clinical case records supplemented by verbal autopsy. The audit does not require confidentiality. Indonesia conducts the national MPA as community-based verbal autopsies for deaths occurring in facilities and in the community. The same is followed in Myanmar but it is not yet nationwide in coverage. India offers a wider range of methods – with the MAPEDIR being a community-based verbal autopsy, Kerala with confidential enquiries of all deaths regardless of where the death occurs, and Tamil Nadu conducting a facility-based audit supplemented by a community-based verbal autopsy. In Safdarjang Hospital, New Delhi, clinical audits have been carried out such as on quality improvement, and with assistance from the WHO country office and SEARO this became a more in-depth facility-based maternal death audit. None of the national programmes include a near-miss audit, although there is evidence that this is being conducted in some hospitals, usually with the initiative of an obstetrician.

Table 3 aligns these findings with the five methods described in the guide *Beyond the Numbers*. 
Table 3. Different maternal death review methods used by the five study countries

<table>
<thead>
<tr>
<th>Maternal death review method described in the WHO Guide Beyond the Numbers*</th>
<th>Country/area that used the method</th>
</tr>
</thead>
</table>
| **Community-based maternal death reviews (verbal autopsies):** | • MAPEDIR in India  
• Tamil Nadu, India*  
• Indonesia*  
• Myanmar*  
• Sri Lanka |
| **Facility-based maternal death reviews:** | • Tamil Nadu, India*  
• Indonesia*  
• Myanmar*  
• Sri Lanka |
| **Confidential enquiries into maternal deaths:** | • Kerala, India  
• Some studies in Indonesia and Nepal  
• Sri Lanka |
| **Surveys of severe morbidity (near-misses):** | • Some studies in Indonesia and Nepal |
| **Clinical audit:** | • Safdarjang Hospital, New Delhi, India  
Sri Lanka |

*A full description of each of the give methods is given in Section 2.2.

*These MDRs use a combination of methods: the audit starts as a verbal autopsy in the community and if the death has occurred in a facility, the records of the facility are also reviewed; this is the method recommended by the national MDR under the NRHM of India.

4.5 Use of maternal death review findings for action and outcomes

In all five countries, the findings from the MDR have been used, to a varying extent, as a basis for polices, strategies and activities to improve the situation and address specific weaknesses. The following are some of the improvements made, generally reported by all studies.

- The maternal death profile elicited by the MDR has been used to understand the background of these deaths, and this by itself has been a strong motivational factor for health staff. The identification of factors operating in the “three delays” have been used to decrease the problems, which include arrangements for better transport, enhancing community awareness, better coordination, and improved referral mechanisms.

- The improvement in logistics has also been highlighted, especially in ambulance services for emergency transportation, better supply of equipment, supplies and interventions such as oxytocin and magnesium sulphate.

- Facilities have been improved, such as setting up an eclampsia ward and establishing centres that provide 24x7 services, and blood bank services.
• There has been additional training for midwives, and development of standard treatment guidelines.

Positive outcomes arising from these findings and actions taken include, in all countries, the following:

• Although not expressed explicitly, all studies suggested that MDR had resulted in greater awareness and stronger support from the higher levels of the administration including policy-makers, supervisors, as well as from local authorities.

• The MDR form is also helpful in improving awareness and motivation in better recording of case histories, contributing to the overall improvement in quality of care.

• Communities and families have become sensitive to maternal health issues. The inclusion of village leaders, religious officials and other policy-makers in audit discussions promotes an intersectoral problem-solving approach to safe motherhood, and local authorities were more prepared to arrange for transport for referred cases in an emergency. This enhanced community awareness has also led to more active participation, including mobilization of local resources.

• The audit fosters a closer working relationship between the different levels of health-care providers by bringing together those who are facility-based and those who are community-based to analyse and deal with the causes of mortality in their areas.

• Midwives work more earnestly in partnership with other providers, promote birth preparedness and improve awareness about health insurance, and undergo training to improve their clinical competency. Actions have been taken to improve communication between village midwives, private midwives, and those based in clinics or referral facilities.

• Communication and coordination between hospital and health offices was improved.

• Some hospitals, local authorities, and the community have generated and pooled MDR funds to provide emergency referral and other services to needy women who cannot afford the costs.

4.6 Strengths and opportunities

The above positive outcomes were made possible and facilitated by certain features of the MDR, which can be considered as the strengths and opportunities:

• A long history of the MDR system or programme such as in Sri Lanka, Kerala and Tamil Nadu (India) has made the system mature, with opportunities for improvement over the period of evolution.

• Government policy and directive, and organizational and managerial arrangements are common features of all MDRs. Regular, weekly clinical meetings are able to provide feedback for recommendations and timely actions. The mandatory
notification and autopsy of all maternal deaths in Sri Lanka is the strongest policy cited in this study.

- Guidelines on implementation have been developed and disseminated, although some of these are not as complete as desired by the users.
- The commitment of physicians and supervisors is found to be a strength of the system; they have been encouraged by the fact that recommendations made at the audit meeting have been used as inputs for district planning, and have resulted in tangible improvements in the health system.
- Commitment of local leaders and authorities has also been generated by the MDRs as exemplified by some hospitals raising funds for needy women. Some local governments at provincial and district level accord priority for maternal and child health services and have put in place regulations or policies to strengthen the programme.
- Finally the aim and objectives of the MDRs themselves are motivating factors for health providers – many expressed their appreciation that an MDR can reveal the causes and contributing factors, which is highly motivating and has made health staff realize that the prevention of maternal deaths is a joint responsibility of many parties.

4.7 Weaknesses and challenges

The weaknesses and challenges found in these studies are listed below.

- Problems related to information:
  - Poor identification and reporting of maternal deaths was noted, especially in the urban areas and among migrant populations. In particular, maternal deaths during early pregnancy and due to abortions are not reported and not captured for audit. Under-reporting of maternal deaths was also found to be due to the midwife deliberately not reporting for fear of being blamed during audit, or merely due to deaths of women in remote and unreachable locations. Under-reporting of maternal deaths is particularly a problem if they occur in another administrative area, as found in Indonesia.
  - Difficulties were faced in interviewing care providers of mothers, and family members of women whose death was related to maternal causes. Families were either not able or not willing to answer correctly and precisely. Conducting an interview soon after a tragedy in a family facing grief is a significant factor and was emphasized as a constraint in the Myanmar study. When enquiries needed to be repeated several times, communities became suspicious and refused to answer. Auxiliary midwives (AMW) and traditional birth attendants (TBA) tended to avoid giving answers or answered incorrectly, as they feared the health department might sue them.
  - Obtaining information from the private sector, especially unlicensed facilities, posed a particular difficulty.
- Bureaucratic procedures posed a barrier to optimal information; some personnel in Indonesia said that they had to “struggle” to obtain the data, and some became demotivated by this.

- Under-reporting and inaccurate reporting are often attributed to the tool of the review. For example, questions in the MPA form (Indonesia) were not comprehensive, especially for questions related to non-medical information; the form used in Myanmar was considered too lengthy and not supplied in adequate quantities; Nepal also reported that the tool was cumbersome.

- Poor planning was cited as another weakness. In several cases, the start of MDR implementation was ill-managed and not well-designed, especially for a national approach which depends on availability of personnel at all levels. There were examples of membership of the audit being inappropriate or inadequate; specifically, one study observed that the Chief Medical Officer of the province/state was not a member of the Maternal Death Review committee.

- The staff and human resource problem was a common theme in all the countries. Besides inadequate staff and increased workload, issues related to competency and supervision at district and lower levels. Lack of training and resource persons was also common. There were no training modules or formal trainers for the programme. The fear of punitive action among health-care providers may lead not only to under-reporting of maternal deaths, but also to demotivation of staff.

- Besides human resources, the lack of other resources was another common factor in almost all the countries. The annual budget allocated to the hospital was insufficient and no separate budget is allocated for MDR system strengthening. An inadequate supply of reporting forms was mentioned in Myanmar. Transport costs were especially mentioned in Myanmar and Indonesia. Indeed, the main limitation of confidential enquiries is their relatively high cost as was experienced in Kerala, and in the pilot project in Indonesia to move from the MPA to the CEMD. Difficult terrain, lack of specialists and poor referral systems, especially in the high-burden districts, are familiar problems in countries like Nepal and Indonesia.

- In hospital MDRs, it is difficult to foster and maintain inter-department cooperation, and it was observed that following termination of the project, coordination tended to decline.

- Social and political constraints: due to fear of punitive action and repercussion from the community, there is reluctance from health functionaries to conduct MDRs. Moreover, there is no proper information, education and communication (IEC) or behaviour change communication (BCC) for community advocacy. Lack of ownership of the programme by the states and districts was cited as a problem in India.

- Attitude and misconception: some health providers considered MPA as just a forum to discuss interesting and important cases, and not necessarily to come to a recommendation. Some communities thought that the MDR was done as a routine practice and not for the prevention of maternal death.

- There are weaknesses inherent in the design of the MDR itself. For example, an MDR that is implemented as a project such as MAPEDIR in India is not easy to
move from the project mode to a programme mode. Doctors working in wards other than maternity (such as emergency, medical and surgical) wards should also be made aware of the MDR system so that there is less chance of missing maternal deaths. Health personnel should take more time filling and reviewing patient charts. Most, if not all MDR programmes do not have a monitoring mechanism. Private sector health-care providers are not included under MDR implementation, neither to capture deaths occurring in the private sector, nor to be represented in the audit team, except in Kerala, India.

4.8 Future directions

All the studies highlighted the need to institutionalize MDR in the formal health-care system, and to scale up current efforts to ensure nationwide implementation. The feasibility of integrating MDR information into the hospital information management system was mentioned specifically by Nepal, which also pointed out that integration of the MDR process should be consistent throughout the country and an aggressive action plan should be prepared to provide orientation on MDR to concerned personnel nationwide.

5. Discussion

5.1 Methodologies

These studies show an encouraging trend from the perspective of SEARO, which has provided technical support to these countries since 2003 to implement and strengthen MDR efforts. The methodologies used in all the five studies were appropriate – mainly review of documents, especially for the evolution of any national MDR programme, observations based on a checklist, and stakeholder interviews. As expected, the studies were largely qualitative, attempting to elicit views of stakeholders to describe the implementation of MDR. This was most clear from the Myanmar study, which presented its findings largely in the form of verbatim responses from the people interviewed.

5.2 Scope

Using these methodologies, the researchers decided to frame the scope, in terms of the number of MDR initiatives to be captured in their study. In the India study, in view of the background knowledge of the NRHM policy, it was useful to see the overall situation in the country; and in view of the size of the country, the methodology feasible to see the overall situation was a “quick” survey. Besides this overall picture, it was useful that the India study also reviewed selected MDR initiatives that were known to exist. This dual approach elicited a good range and amount of information. Indonesia studied the main national MPA, and seven other initiatives known to have been or were being carried out. It is reasonable to assume that the seven studies selected were a good representation of other possible MDR studies in the country. The findings from the seven studies gave a fairly good range of information on the
status of implementation. It is also useful that at least three of these studies were linked to the national MPA, thus adding value in the triangulation of data.

The same approach was used in Nepal where the single national MDR programme (limited to hospital-based reviews) was studied, complemented by several studies found from an extensive literature review. In the Sri Lanka study, the national MDR programme has a rich and long evolution, which enabled the researcher to conduct a detailed and in-depth study of this programme, describing each administrative procedure. In Myanmar, again it was known that a nationally-driven MDR existed, but still restricted to a pilot area, which the study covered. The researcher was also aware of MDRs being carried out in specific hospitals, led by the initiative and by interest of the resident obstetrician.

The mandate of the researchers extended beyond national initiatives to ascertain all existing MDR initiatives. However, the scope was dictated by the time and funding available for the study, and thus the number and range of MDR initiatives that could be included. For example, it is well known that NGOs in India are active in this field: the Government of Uttar Pradesh commissioned the Indian Institute of Public Health to conduct a community-based maternal death audit in the district of Unnao in 2010, based on the belief that most maternal deaths occur outside of a health facility, and audits in the facility (if at all conducted) will not tell a complete story.

The existence of nationally-led initiatives, although not necessarily implemented nationally, in all five countries augurs well for this system to be carried forward in the quest to improve information on maternal deaths, and to ensure its sustainability. From the findings, it is clear that Sri Lanka will find it relatively easy to improve further its existing system. The experience of the United Kingdom, South Africa and Malaysia where CEMD is well established highlights the advantage of a strong central national directive. Therefore it is encouraging that India, through the NRHM, made a policy in 2010 and sent directives to all states to conduct MDRs. Indeed, India created history when in February 2010 the Delhi High Court ordered the health authority to conduct a maternal death audit on a young woman from a low caste who died, allegedly because several hospitals refused to treat her for lack of money.

Variability in the extent of implementation and integration was a predictable finding, since these initiatives were introduced at different times: a long history in Sri Lanka, India (Kerala and Tamil Nadu), and to a lesser extent, Nepal and Indonesia which began its national MDR in the 1990s. In Sri Lanka, implementation of the national MDR pervades throughout the country. On the other hand, the MDR in Myanmar, limited to 30 townships, only started in 2010. Countries as big and diverse as India and Indonesia face challenges to ensuring rapid and full implementation, which will take time. Likewise it is not a surprising finding that in India, five of the six states that fulfilled all the criteria – Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu – are the more “developed” and literate Indian states (the sixth is Rajasthan, where maternal health and survival is still a matter for concern). In this context, a national MDR programme is purposely designed to be, and will inevitably be implemented in a phased manner, with scaling-up to wider geographical coverage with the passage of time. The Myanmar MDR, which is by design geographically restricted, was assumed
to undergo the same scale-up or expansion, but the study did not reveal any specific plan for this.

In some countries, maternal death audits provide an opportunity to conduct perinatal and/or neonatal death audits as well, especially when the causes and contributing factors of a maternal death are the same as for the death of the fetus or newborn. Only Sri Lanka focuses on maternal deaths and executes a separate review for perinatal deaths in all specialized hospitals in Sri Lanka. The incorporation of a perinatal death audit (India, Indonesia, Nepal) or a neonatal death audit (Myanmar) is based on appropriate policy decisions in each country to expand the scope of MDR to these audits.

5.3 Methods

The five methods of maternal death review/audit described in the guide *Beyond the Numbers* are used to varying extents, with facility-based audits being common to all. This is in line with the technical support provided by SEARO between 2003 and 2007, which focused on this method. The approach of a combined method – a facility-based MDR supplemented by a community-based MDR – as conducted in Tamil Nadu (India), Sri Lanka and Indonesia has obvious advantages as it enables health-care providers to learn from the findings and take corrective action at the local level.

This combined approach is advocated by the Government of India under the NRHM in the policy made in 2010. The community-based enquiry, in addition to the existing facility-based enquiry, will offer added benefit because information from stakeholders and the community through a verbal autopsy is invaluable, regardless of whether the death occurred in a facility or in the community.

Although no MDR initiative formally included audits of severe maternal morbidity or near-misses (a useful means of assessing quality of care in a facility), this method was reported in the studies in Indonesia, Nepal and Sri Lanka. One reason is perhaps that large numbers of maternal deaths, such as in India, provide enough information on a wide range of causes and circumstances, which will not be the case in a small country such as Maldives and Bhutan, or for a country with few maternal deaths such as Sri Lanka and Thailand.

It is clear from this study that most, if not all of these countries are ready to expand the current system to near-misses, and indeed this was a recommendation of the Sri Lanka study. Lessons can be learnt from Malaysia and South Africa where the CEMD was expanded to include near-miss cases. In 2011, SEARO provided support to Maldives to start a maternal near-miss audit (which also included a perinatal death audit). One of the problems being addressed by WHO is the lack of a standard definition and uniform case identification criteria. Besides formal near-miss audits, some countries (even those without a formal MDR in place) conduct audits of specific morbid conditions to assess the quality of care, as in five provinces in south Thailand that assessed incidence and quality of care for pre-eclampsia, eclampsia, post-partum haemorrhage and obstructed labour.
It is also expected that the MDR in the five study countries covers only maternal deaths defined as a death during pregnancy, childbirth or within 42 days of termination of pregnancy, due to direct or indirect causes. In countries such as the United Kingdom, where the number of maternal deaths is relatively small, the MDR may be extended not only to audit near-miss cases, but also late maternal deaths, defined as a death after 42 days but before one year of termination of pregnancy. However, in Sri Lanka, the notification criteria includes all reproductive age female deaths up to 1 year after termination of pregnancy. It is also to be borne in mind that an MDR starts with all pregnancy-related deaths, and it is only after the audit team has classified the deaths that incidental deaths will be detected and excluded in the calculation of MMR. In this regard it is noteworthy that the MMEIG, in its estimation of MMR for 2010, had applied a model for estimating AIDS-related indirect maternal deaths. In the CEMD in Malaysia, while all incidental deaths (termed “fortuitous” in its report) are excluded from calculation of MMR, the CEMD committee examines all aspects of care given to prior to these deaths, and recommendations are made to prevent such deaths in the future.

5.4 Stakeholders

The CEMD in Kerala and facility-based reviews in Sri Lanka deserve to be lauded for including professional organizations (which actually played a leading role in starting the CEMD). This is one way, albeit an indirect one, of involving the private sector, which has an important role both for ensuring that deaths in private facilities are audited, as well as having private sector experts in the audit team. However, the possibility of legal implications has prevented many countries (such as Malaysia) from adopting this approach. Similarly, there has been debate on the inclusion of members of the lay public and civil society in some death audits, such as those on maternal, peri-operative or other deaths. Again the possibility of negative outcomes in terms of litigation and public outcry has made this an uncommon practice. The expressed opinion of respondents in Indonesia, Nepal and Sri Lanka on the fear of possible litigation is significant, and merits attention and decision.

5.5 Maturity of programmes

Not surprisingly, the breadth and richness of the findings of these MDRs appear to be influenced to a substantial extent by the maturity of the MDR programme. This was best seen in the CEMD in Kerala which has been in existence for more than ten years and the Tamil Nadu MDR which has been implemented for more than six years; both these generated a wide range of findings, including the changes that the programme had undergone. The same is assumed to be the case for Sri Lanka, although the report had not highlighted this. Likewise, the MPA in Indonesia, which has existed since the early 1990s, generated enough findings to argue for a change in approach to incorporate confidentiality. Nepal too has had a national MDR since the 1990s and also generated a wide range of findings, but these have not led to any major amendment of the programme. It should be noted, however, that the National Maternal Perinatal Death Review Committee (NMPDRC) in Nepal does meet, albeit infrequently. As for Myanmar, the MDR by community verbal autopsy is relatively
new and thus there were fewer findings, which were mostly in the form of opinions of sampled stakeholders expressed verbatim, with little quantitative descriptions.

5.6 Leadership

Clear organizational and managerial arrangements are reflective of the governmental leadership in the MDRs. The MDR in India, Indonesia, Myanmar, Nepal and Sri Lanka are all driven by the central government. The experiences of Malaysia, South Africa and the United Kingdom also highlight the role and leadership of the government. While this is true for MDR initiatives that are intended for nationwide applicability (although some may begin at a pilot stage), the government does not need to exert its leadership for independent individual initiatives such as those carried out as clinical case audits in hospitals, which are generally carried out as quality assurance programmes. In fact, MDRs in hospitals are often part of a broader audit, such as on peri-operative deaths.

The importance of having audit teams/committees with clear terms of reference and mandate was highlighted; this was specifically described in the Nepal study. There is an implicit requirement that MDR committees should meet at regular intervals, depending on the number of deaths/cases to be audited. In the Nepal study, the committee has only met twice at national level, which is unexpectedly infrequent. The composition of the committee is well described in the Nepal study but less clear in the others. All studies mention the role of an obstetrician, and it can be reasonably assumed that the obstetrician leads or at least is a central figure in the audit committee. Other relevant clinical and paraclinical disciplines are anaesthesiology, pathology, laboratory, and blood banking. It is not uncommon that the deceased woman had multiple underlying medical problems such as heart disease, tuberculosis or AIDS, and may therefore have gone through more than one speciality.

5.7 Impact

An encouraging finding was the use of the MDR results to change policies, formulate strategies and take remedial action, which is the main reason for conducting an MDR. In particular the MDRs very strategically analysed contributing factors from the aspect of the three delays that led to clear identification of actions to be taken, such as better transport, improved referrals and better quality of care at facilities. The latter includes better supply of equipment and life-saving drugs such as magnesium sulphate, oxytocics and antibiotics. The improved facilities reported by Tamil Nadu, including a new eclampsia ward and establishing centres for round-the-clock services, as well as increased blood bank services, are commendable. This central aspect of MDR has been reported and published by countries with well-established MDR programmes.

Another major outcome of MDRs is guidelines for case management. The second report of CEMD in South Africa (1999–2001) stated that these guidelines had not only been developed, but were put on display for optimal dissemination. Similarly, the CEMD Committee in Malaysia published a simple, user-friendly handbook on case management in 2005 for busy young doctors, the contents of which were based
on findings of CEMDs conducted over two decades, and near-miss audits over one decade.

5.8 **Strengths and opportunities**

The strengths and opportunities identified in this study cover a wide range of positive trends. Significantly, one strength mentioned by many respondents was the commitment and support of physicians and supervisors. Equally noteworthy is the fact that this commitment was not so much because they followed the rules and procedures as part of their functions, but because they were encouraged by the several positive outcomes of the MDR; moreover, the MDR was able to reveal not only the clinical cause of death but also the contributing factors, which empowered them to take specific actions. The main thrust and goal to identify preventable factors at every stage was successful, since remedial actions appear to have been well understood by health staff involved. Organizations involved in the MDR are seen to have experienced **better working relationships** and linkages. The fostering of a closer working relationship between the different levels of health-care providers cited by several respondents reflects this positive change.

5.9 **Weaknesses and challenges**

The weaknesses and challenges identified cover a wide range of issues, as expected from such a study. It is also not surprising that several problems cited by almost all respondents (indeed emphasized by many) are those related to **difficulties in obtaining information** for various reasons that were similar in all countries. The issue of fear either of being sued or of other punitive action is a real fear, found in other countries too. This underscores the importance of proper briefing, training and motivating of all staff involved in the audit.

With regards to poor information, the universal constraint of MDR in developing countries is **poor coverage of vital registration**, and many deaths are not reported or identified. In the July 2011 report of the Commission on Information and Accountability established under the Global Strategy for Women’s and Children’s Health, the first of 10 recommendations is to encourage and support countries to improve reporting of deaths by putting in place a national vital/civil registration system. All countries of SEAR are poor in this respect, and the establishment of such a system will take time and considerable resources. The MMEIG uses different methods to adjust national data for international comparison, and found that even in countries with complete death registration, assignment of the cause of death is generally unreliable, thus leading to pregnancy-related and maternal deaths being missed. This further underscores the importance of MDRs.

**Poor planning** was cited as another weakness. In several cases, the start of MDR implementation was ill-managed and not well-designed, especially for a national approach which depends on availability of personnel at all levels. There were examples of the membership of the audit being inappropriate or inadequate.
Staff, funding and other resource shortages were cited by all studies. It cannot be denied that a good MDR requires additional work, and additional financial input. Any form of MDR, especially one that is nationwide, or one that uses both facility- and community-based approaches, requires a certain budget. In Malaysia, when the CEMD was introduced in 1991, an annual budget was earmarked for MDR activities including meetings of the audit committee, which are conducted at national level three to four times a year. The benefits and consequences of a good MDR system, as shown by pioneering countries such as the United Kingdom, as well as Malaysia and South Africa, far outweigh the resources required.

Just as MDRs come with a certain cost, it is equally true that they come with additional workload. Besides having to have competence and skills, the staff involved in conducting an MDR need to be highly motivated, because this task is over and above their clinical patient care functions, and very often time consuming. In countries that have successfully implemented a CEMD, a senior nurse in the hospital is appointed as the coordinator for the CEMD. The issue of incentives was mentioned in the Indonesian and Nepal studies, and is something to be looked into. In countries that implement CEMDs (Malaysia, South Africa, United Kingdom), there is no incentive in terms of payment, but there may be other forms of incentive such as continued medical education or fellowships. There is anecdotal evidence that health professionals participating in MDRs have a sense of professional satisfaction and pride.

The mention of negative health providers’ attitude, in which MPAs are considered just a forum to discuss interesting cases and not necessarily to recommend solutions to a problem, could be a misconception or a lack of understanding.

5.10 The way forward

It is encouraging to note that the health providers have a clear idea of the way forward for MDRs in their respective countries, mentioning the need to institutionalize or scale up the current MDR and integrate MDR information in the hospital information management system.

The willingness, commitment and ability of the five countries to implement MDR are commendable and augur well for government efforts to reduce maternal deaths and improve maternal health. The researchers of this study therefore considered that a developed country’s maternal mortality review could be used as the gold standard for a developing country. The findings of this study as well as the experience of other developing countries corroborate this approach e.g. MDR in South Africa was compared with that in the United Kingdom and concluded that the approach used by a developed country is just as applicable to a developing country. A similar argument can be applied to Malaysia, another developing country. The experiences of Sri Lanka, and the states of Kerala and Tamil Nadu in India, as seen from this study, are also testimony to this.
6. Recommendations

6.1 Country-specific recommendations

The recommendations presented in the individual reports are reproduced below.

**India**

To scale up MDRs in India, the following actions are needed:

- to conduct advocacy to sustain the current high level of national commitment to MDR, and to motivate states that have not yet institutionalized MDR;
- the NRHM director in all states to monitor MDR;
- to ensure regular communication and feedback from the centre to states;
- to include MDR in the Joint Review Mission of Reproductive and Child Health programme (RCH) and the Common Review Mission (NRHM);
- to make reporting of maternal deaths compulsory both for private and public hospitals;
- to provide adequate flexible funds and accord priority to MDR;
- to integrate MDR to ensure coherence and linkages with other programmes;
- to empower individuals, families and communities to participate in activities to improve maternal health; and
- to involve professional associations such as the Federation of Obstetricians and Gynaecologists (FOGSI) and the Indian Public Health Association (IPHA).

To monitor the MDR initiative, the following actions are required:

- the state NRHM to designate nodal person and to accord priority to monitoring;
- to institute a system of regular feedback to the state, districts and institutions;
- to include MDR in the ongoing monitoring of MDG4 and 5;
- to put in place a quality assurance system of MDR implementation; and
- to take remedial actions to address the gaps at all levels.

**Indonesia**

Recommendations made by the Indonesian study comprise the following:

- the MPA to improve its reporting and recording for a more complete identification of maternal deaths and, for this, coordination and linkage with the system of death registration should be pursued;
• the revised MPA to be optimally implemented and further evaluated after a period of time to assess its effectiveness;
• efforts should be made to strengthen the clinical case audits and integrate, or at least link these to the revised MPA; and
• to monitor and evaluate the MPA programme using the steps and indicators outlined in the WHO guide Beyond the Numbers.

Myanmar

Priority actions recommended in the Myanmar study are:

• to revise MDR forms to be less lengthy, while ensuring adequacy and completeness of information captured;
• to ensure that a sufficient quantity of the forms are supplied;
• to conduct training and skill-building since several midwives expressed lack of skills and confidence in filling up the audit form;
• to equip health facilities properly; even if this does not directly contribute to the MDR, it is a form of incentive to the audit team;
• to review the requirement to conduct the verbal autopsy within seven days of the death;
• to address the issue of transport costs through the township health supervisory committee; and
• to conduct continuous monitoring of the MDR.

Nepal

Recommendations to improve MDR in Nepal were:

• to revise the organizational structure by increasing sanctioned health posts as well as medical records personnel;
• to ensure regular supervision in hospitals from the national level;
• to continue the current National Maternal Perinatal Death Review Committee and improve its capacities; in hospitals where the committee and review teams are not very active, to conduct regular meetings to review maternal deaths or findings;
• to provide staff training on International Classification of Disease (ICD) 10 coding and advanced data analysis and management;
• to motivate staff, allay their fears and reservations; and consider the issue of incentives;
• to strengthen resources in all hospitals to deal with deliveries and obstetric emergencies, including adequate blood bank services, intensive care units (ICUs),
ambulances, drugs etc.; revamp and enhance hospitals built to meet the needs of the 1990s in order to meet current needs;

- to allocate some funds to the medical records section to manage administrative and logistic requirements;
- to develop the computerized hospital information management system so as to reduce the burden of paper work;
- to standardize the hospital admission and discharge sheet so as to record all information required to complete the MDR form;
- to make the MDR form user-friendly so that staff do not feel over-burdened in carrying out this task; and
- to incorporate confidentiality.

**Sri Lanka**

Sri Lanka prioritized the following recommendations for MDRs:

- to continue the current work on MDR, ensure that investigations and review meetings are conducted regularly as scheduled, and disseminate the minutes promptly for implementation of recommendations;
- to study the areas where there are weaknesses, and address these weaknesses;
- the Family Health Bureau (FHB) to create a system of surveillance of maternal deaths in real time (as they occur) and not wait for the annual national MMR;
- to strengthen cooperation and linkages between the two main arms of the Ministry of Health – curative and preventive health services – so that a maternal death in a hospital is made known with the least possible delay by the responsible officers in preventive services, and for better coordinated actions taken as a follow-up to the review;
- to start/institutionalize audits of severe maternal morbidity (near-misses) to ensure that the range of cases and experiences cover as complete a profile as possible (especially medical causes, but also contributing factors) since the number of maternal deaths is too small to ensure this; and
- to take all possible actions to ensure that the current system of MDR and surveillance is sustained.

### 6.2 Overall recommendations

From the above, the recommendations applicable to all five countries can be summarized as follows:

- The current MDR programme should be strengthened in terms of management and oversight, including the establishment of a multi-disciplinary audit team/committee with clear terms of reference and regular audit meetings.
• Weaknesses should be addressed, especially related to cumbersome data collection tools, and more complete data collection and reporting should be encouraged.

• Issues related to resources and logistics should be addressed, such as the costs incurred for transport and duplicating forms.

• The existing MDR should be scaled up to cover the whole country where current coverage is limited.

• The expansion of the methods of MDR to an optimal mix of facility- and community-based reviews should be considered to ensure a more complete coverage and provide a more reliable situation, as well as the incorporation of confidentiality in the reviews.

• Capacity-building should be conducted, especially training of health staff involved in the MDR, to enhance their competency.

• Health staff should be motivated to allay their fears of punishment and censorship.

• The rationale and feasibility of incentives for staff involved in the MDR should be studied, and the types/mechanisms of incentives identified, if these are to be introduced.

• Integration of the MDR with other related programmes should be promoted in the country so that it is not a stand-alone vertical initiative.

• The feasibility and acceptability of having representatives of the private sector (hospitals), professional associations and the lay community in the audit team/committee should be reviewed.

• Health education and public information should be conducted to raise the awareness of the community on the importance of MDR.

7. Conclusions

A medical death reviews is being implemented in the five countries studied. There are differences and commonalities in the form it takes, the approaches used, the geographical area targeted, the extent of implementation, and future plans. MDR initiatives resulted in improved understanding of the circumstances surrounding maternal deaths, which has led to specific remedial actions and responses to prevent future deaths. These initiatives have strengths and positive characteristics that can allow countries of the South-East Asia Region to learn from one another. There are still weaknesses and constraints that make it challenging for the countries to optimally implement their MDR, and these represent useful information to identify areas of further support that the WHO Regional Office for South-East Asia can provide to these countries.
8. References


The maternal mortality ratio universally used to track Millennium Development Goal No. 5 – to reduce maternal mortality and improve maternal health – is only a quantitative measure and is not sufficient to prevent maternal deaths. To understand the circumstances that lead to, or contribute to, these deaths, a maternal death review (MDR) or audit is needed. The World Health Organization guide “Beyond the numbers: reviewing maternal deaths and complications to make pregnancy safer” (2004) describes the methods of the MDR. Countries of the South-East Asia Region have been implementing MDRs using any combination of these methods to varying extents.

This study on the implementation of MDRs was conducted in five countries in the Region, namely India, Indonesia, Myanmar, Nepal and Sri Lanka. Each study was carried out with the same general aim to ascertain the level of MDR implementation (in any form or by any method) in the country, to strengthen the MDR as necessary, and to assist countries in building on their experiences to move towards maternal death surveillance and response.

While the MDR was being implemented in each of the five countries, the form it took and the magnitude of implementation varied. In general, these studies recommend that the respective countries strengthen the management of the current MDR programme, and address the weaknesses identified, including strategies to raise the awareness of policy-makers and members of the community on the importance of MDR.
A study on the implementation of maternal death review in Sri Lanka
A study on the implementation of maternal death review in Sri Lanka
WHO Library Cataloguing-in-Publication data

World Health Organization, Regional Office for South-East Asia.

Maternal death review in selected countries of South-East Asia Region.


# Table of Content

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbreviations</td>
<td>iv</td>
</tr>
<tr>
<td>Executive summary</td>
<td>vii</td>
</tr>
<tr>
<td>1 Introduction</td>
<td>1</td>
</tr>
<tr>
<td>2 Background</td>
<td>1</td>
</tr>
<tr>
<td>2.1 Health system and maternal health in Sri Lanka</td>
<td>2</td>
</tr>
<tr>
<td>2.2 Maternal death review in Sri Lanka – a historical perspective</td>
<td>2</td>
</tr>
<tr>
<td>3 Objectives and methodology</td>
<td>3</td>
</tr>
<tr>
<td>3.1 Objectives</td>
<td>3</td>
</tr>
<tr>
<td>3.2 Methodology</td>
<td>3</td>
</tr>
<tr>
<td>4 Findings</td>
<td>3</td>
</tr>
<tr>
<td>4.1 The review/audit methods</td>
<td>3</td>
</tr>
<tr>
<td>4.2 Sources of data and maternal death surveillance system</td>
<td>4</td>
</tr>
<tr>
<td>4.3 Processes and procedures of maternal death review</td>
<td>5</td>
</tr>
<tr>
<td>4.4 Follow-up actions taken and outcome of maternal death review</td>
<td>10</td>
</tr>
<tr>
<td>4.5 Strengths and weaknesses</td>
<td>11</td>
</tr>
<tr>
<td>5 Discussion</td>
<td>12</td>
</tr>
<tr>
<td>6 Recommendations</td>
<td>14</td>
</tr>
<tr>
<td>7 Conclusions</td>
<td>15</td>
</tr>
</tbody>
</table>
Abbreviations

3 delays first delay: decision to seek care; second delay: difficulty in obtaining care, especially getting to a health facility; third delay: once at a health facility, inadequate, improper or no care given

Adolescent Individual between the age of 10–19 years

BCC behaviour change communication

BHT bed head ticket

CEMD confidential enquiries into maternal deaths

DDG-PHS Deputy Director General of Public Health Services

DGHS Director General of Health Services

DHS Demographic Health Survey

DMMR District Maternal Mortality Review

FHB Family Health Bureau

GDP gross domestic product

GNP gross national product

HMIS Health Management Information System

JMO Judicial Medical Officer

MCH/FP maternal and child health/ family planning

MDG millennium development goals

MDR maternal death review

MMR maternal mortality ratio

MNH maternal and newborn health

MO-H Medical Officer of Health

MO-MCH Medical Officer of Maternal and Child Health

NMMR National Maternal Mortality Review

NNMR neonatal mortality rate

NPM national programme manager

PDHS Provincial Director of Health Services

PHI public health inspector

PHM public health midwife
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHNS</td>
<td>public health nursing sister</td>
</tr>
<tr>
<td>RDHS</td>
<td>Regional Director of Health Services</td>
</tr>
<tr>
<td>RGD</td>
<td>Registrar General’s Department</td>
</tr>
<tr>
<td>RHCS</td>
<td>Reproductive Health Commodity Security</td>
</tr>
<tr>
<td>TFR</td>
<td>total fertility rate</td>
</tr>
<tr>
<td>UMN</td>
<td>unmet need (for contraception or family planning)</td>
</tr>
<tr>
<td>UNFPA</td>
<td>United Nations Population Fund</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>WWC</td>
<td>Well Woman Clinic</td>
</tr>
</tbody>
</table>
Executive summary

The achievement of Sri Lanka as a developing country in attaining a good status for mothers and children is acknowledged worldwide. The decline in the maternal mortality ratio (MMR) over the last decades has been impressive. One of the approaches taken was to understand better the factors and causes of maternal deaths through a maternal death audit, which started in the 1980s and has since undergone gradual strengthening.

Objectives and methodology: The overall objective of the study was to review the implementation of maternal death reviews (MDR) in Sri Lanka, and specifically to describe the processes, recommend steps for strengthening the MDR and draw lessons and share Sri Lanka’s experience with other countries in the South-East Asia Region. The methodologies used were an in-depth desk review of the literature, a stakeholder workshop and key informant interviews.

Findings and discussion: The MDR in Sri Lanka has been well established since the 1980s, with a single unified system implemented nationwide. The main method used is the facility-based review of maternal deaths with assured confidentiality; however investigations of these deaths often also use verbal autopsy and clinical audits. There is as yet no formalized system of audit of severe maternal morbidity or “near-miss” cases.

The sources of maternal death data are vital registration and health information systems, which are the basis of the maternal death surveillance system. Notification of maternal death is required by law; similarly all such deaths are required to undergo autopsy examination. There are clearly structured processes for an immediate investigation of every maternal death at facility or community level, and an MDR conducted every six months at district level, and every year at national level.

There is also a clear organizational and managerial structure to guide the system and processes, with strong governance at all levels and the Family Health Bureau in the Ministry of Health at the apex of this structure. Recommendations are made and acted upon following every review. Some of the products and outcomes include human resource strengthening such as cadre increase of public health midwives (PHM), improved blood bank facilities, wider use of the partogram, improved emergency obstetric care, rapid communication systems and development of several guidelines. In terms of impact, it is reasonable to assume that strong maternal death surveillance has contributed to the decline in the overall MMR.

The strengths of the system include the unified single model involving public and private sectors, solid governance and clearly defined processes and procedures, the strong maternal and child health service delivery system backed by a well developed vital registration health information system. Weaknesses include data gaps and problems of under-reporting; the need for better quality in autopsy examinations; the lack of legal immunity and the need for more accountability and commitment at provincial and district levels.
Conclusions and recommendations: MDR in the form of facility-based reviews is well established in Sri Lanka, and positive outcomes have accrued. It is reasonable to suggest that this initiative has contributed to the decline in maternal mortality. The recommendations from this study are to: continue the current work on MDR; ensure that investigations and review meetings are conducted regularly as scheduled; disseminate minutes rapidly for implementation of recommendations; address areas of weakness; systematize surveillance of maternal deaths in real time without waiting for the annual national MDR; strengthen cooperation and linkages between curative and preventive health services; institutionalize audit of severe maternal morbidity (near misses) to ensure the range of cases and experiences; and take all possible actions to ensure that the current system of MDR and surveillance is sustained.
1. Introduction

The achievement of Sri Lanka as a developing country in attaining a good status for mothers and children is acknowledged worldwide. The decline in the maternal mortality ratio (MMR) over the last decades has been impressive. The low MMR makes it difficult for further decline, although Sri Lanka continues to make every effort to attain this. One of the strategic steps was to understand better the factors and causes of maternal deaths in depth, to enable the formulation of appropriate interventions in a challenging environment. Therefore it was not unexpected that Sri Lanka embarked on a maternal death review (MDR) earlier than other countries in the South-East Asia Region. The guide Beyond the Numbers – Reviewing Maternal Deaths and Complications to make Pregnancy Safer (WHO, 2004), describes five specific methods for conducting an MDR:

- Facility-based maternal death audits/reviews;
- Community-based verbal autopsy;
- Confidential enquiry into maternal deaths;
- Clinical audits; and
- Audits of severe maternal morbidity or near-miss cases.

The approach used in the Sri Lanka study differed substantially from the other four studies in India, Indonesia, Myanmar and Nepal, largely because there is only one unified system throughout the country, which led the researcher to focus in depth on the evolution of this well-established system and to describe its processes and procedures in considerable detail.

The status of MDR in Sri Lanka as reported at the Regional Workshop on Strengthening Capacity for Facility-based Maternal Death Reviews, held in 2007, was as follows.

“All maternal deaths since 1985 are required to be notified. The results of the field and institutional investigations are reviewed by a multi-disciplinary expert panel at the national maternal mortality review meetings. The analysis of maternal deaths produced vast information related to causes of death, place, time, type of delays and other related factors. Follow-up actions of the review are identified at the community and facility level at the time of investigation, at the district level on a quarterly basis and at the national level on an annual basis. Findings of the review are broadly disseminated and follow-up is reported regularly at the district and national levels. Strengthening maternal death surveillance through improving notification and follow-up at the local and ministerial levels and by conducting near-miss enquiries are among the plans for the future.”

2. Background

Because the study on the implementation of MDR in Sri Lanka placed considerable focus on the development and evolution of the system, and the researcher has given
an elaborate description of the review process, much of this will be dealt with as findings of the study. Background information is thus only given on the health system, maternal health situation, and the fundamental features of the evolution of the MDR in the country.

2.1 Health system and maternal health in Sri Lanka

With a well-established health system providing free health services to all Sri Lankans, and universal free education supplemented by several other welfare measures, Sri Lanka has achieved significant gains in the area of human development. In comparison with countries with similar economic background, Sri Lanka has achieved relatively high levels of health and social indicators despite a gross domestic product (GDP) per capita of US$ 2399 (Central Bank 2011) and nearly 9% of the population living below the standard poverty line (Department of Statistics 2010). The life expectancy of Sri Lankans for both sexes is 74 years, and 90% of women are literate. This achievement is in spite of the civil war that raged for more than 30 years. With the recent end of the war, the Government has put in place several strategies to improve further the health delivery system, especially in the areas most affected by the war, and this improvement includes services for maternal and child health (MCH).

In 2010, the MMR was 31.6 per 100 000 live births, and the infant mortality rate was 8.5 per 1000 live births. Much of this success is attributed to the strong political commitment and robust health system in the country. The Government health-care delivery system forms a dense, integrated network with more than 15 000 doctors both in the curative and preventive sectors. There is one doctor for every 1462 population. Most Sri Lankans live within 3 km of a public facility (Rannan-Eliya and Sikurajapathy, 2008). What makes this achievement even more impressive is the relatively low level of spending on health care – health expenditure does not exceed 3% of GDP and the health budget is 8% of the national budget. Another feature of the strong health system is a solid health information system that includes maternal death surveillance. This is enhanced by a robust vital registration system.

2.2 Maternal death review in Sri Lanka – a historical perspective

Revitalization of the MDR system at national level took place under the leadership of the Director of Health Services in the 1980s. MDRs were conducted together with the Expanded Programme for Immunization (EPI) reviews. The Family Health Bureau (FHB) took the initiative to organize these with the relevant field staff. This reflects the commitment of high-level officials of the Ministry of Health (MoH) to probe and understand the causes of maternal deaths and their attempt to avert them. The role of the FHB as the central organization responsible for MDR was made clear in the early 1980s with the revision of the MCH information system. This strengthened the collaboration between the FHB and regional public health teams at various levels of the health-care delivery system, and the hospital system was also strengthened with the Director playing a major and direct role. Collaboration was forged with key stakeholders including the Sri Lanka College of Obstetrics and Gynaecology.

In 1985, a maternal death investigation format was introduced with maternal deaths being reported directly to the FHB. The Safe Motherhood Initiative, launched in Sri
Lanka in 1987, spearheaded advocacy and brought focused attention on maternal mortality to the local public health agenda. Maternal deaths were made notifiable in 1989 since when structured maternal death investigations started covering the entire country. Between 1994 and 2008, several improvements were made to the system in terms of methodology and process, data collection, processing and dissemination, and follow-up action including policy changes and advocacy. Other positive steps taken to strengthen the MDR are described in the section on findings of the study.

3. Objectives and methodology

3.1 Objectives

The overall objective of the study was to review and draw lessons from the implementation of MDRs in Sri Lanka. The specific objectives were:

- to describe the processes of the MDR;
- to recommend steps for strengthening the MDR in the country; and
- to share Sri Lanka’s experience with other countries in the Region.

3.2 Methodology

The following methodologies were adopted in compiling information for this document:

- an in-depth desk review of the literature (documents/reports/Internet search);
- a stakeholder workshop; and
- key informant interviews.

More than 20 professionals participated in the stakeholder workshop. These included the former Secretary of Health (who pioneered MDRs in Sri Lanka), former directors of the FHB, provincial administrators, clinicians, representatives of professional colleges, national programme managers (NPM) and representatives from international nongovernmental organizations. Key informant interviews were conducted with selected stakeholders by the NPM – maternal mortality surveillance based on an unstructured question template to gather historical perspectives.

4. Findings

4.1 The review/audit methods

Four of the five methods described in the guide Beyond the Numbers (WHO, 2004) are used in Sri Lanka. However, these are not separate initiatives, but rather four methods conducted within a unified nationally-led MDR system, which essentially uses in-depth facility-based reviews with assured confidentiality. A verbal autopsy (community level) is carried out as a field investigation by all relevant field health-care
workers as a method of identifying the medical causes of death and ascertaining personal, family and community factors that may have contributed to the death. A facility-based MDR is conducted as an in-depth investigation of the causes and circumstances surrounding maternal deaths occurring in health facilities, with the participation of all the health-care workers involved in the management of the deceased woman including the forensic pathologist who conducted the postmortem. There is as yet no formal or institutionalized review or audit of severe maternal morbidity or “near-miss” cases.

4.2 Sources of data and maternal death surveillance

The system is backed by two sources of information – vital/civil registration, and a health information system – which form the basis of a maternal death surveillance system.

4.2.1 Vital/civil registration

The vital registration system plays a major role in generating maternal mortality data. Collection and compilation of data on vital events is the responsibility of the Registrar General’s Department (RGD). A voluntary civil registration system of births and deaths began in 1867. This was later made compulsory under a Government law in 1887. In 1951, the Birth and Death Registration Act was enacted which required that every live birth had to be registered within 42 days and death within 5 days. Civil registration activities have been decentralized to the Divisional Secretariat level and accordingly a District Registrar has been established in every Divisional Secretariat. A survey conducted in 1981 assessed the completeness of birth and death registration to be 98.8% and 94.0%, respectively. Annual estimates of vital statistics are compiled by RGD based on monthly mortality returns sent by Registrars of Births and Deaths all over the country. This includes maternal mortality estimates.

4.2.2 Health information system

Improvements in maternal health services described above have been matched by improvements in the health information system. A Health Management Information System (HMIS) for MCH and family planning operated by the FHB in the Ministry of Health aims to generate quality MCH information. The HMIS captures maternal death statistics from all hospitals on a monthly basis, but there is room for improvement for a more complete reporting. The vital registration and health information system are the foundation of maternal death surveillance.

4.2.3 Maternal death surveillance

The FHB set up an island-wide surveillance system of maternal deaths in 1989. A single surveillance system operated at national level ensures smooth implementation and complete coverage of the country. All important variables of maternal mortality information are entered into the National Maternal Mortality Database maintained at the Maternal and Child Morbidity and Mortality Surveillance Unit. A computerized database in Microsoft Access® was
developed and maintained at FHB. A new record is created with each maternal death notified to FHB with a unique identification number. A thorough check is done for duplication with identifiable variables such as name, address, age, and hospital in-charge. Upon receipt of the Maternal Death Investigation form (field or institute), the database is updated with new information. A medical officer with public health experience and trained in maternal mortality surveillance oversees the data entry and data quality.

The cause and category of maternal death, preventability and “three delays” that have been worked out at the National Maternal Mortality Review (NMMR) are entered in the database. The underlying cause of death is determined based on the World Health Organization (WHO) draft proposal on maternal death classification. All reported deaths are categorized as: direct maternal deaths, indirect maternal deaths, late maternal deaths, non-maternal deaths (pregnancy-related deaths), or reproductive-age female deaths.

Several mechanisms are adopted to assure the quality of the maternal mortality surveillance. Completeness of investigation reports are ensured at institutional level by the head of the institute, at peripheral level by the MCH medical officer (MO-MCH) and at FHB level by the District MCH Officer and the NPM. A well-structured reminder system has been introduced, which has improved the completeness of investigations. Steps have been taken recently to streamline postmortem examinations, and the conduct of autopsies of maternal deaths has increased from 62% in 2007 to 99% in 2011.

4.3 Processes and procedures of maternal death reviews

There are two levels of MDR in Sri Lanka: a maternal death once notified is investigated within a week at the community/field, and institution (hospital) level. In addition, every six months the district health authority carries out a review of all maternal deaths investigated in that period, and every year a national review is conducted. The half yearly and annual reviews assess and make further recommendations on the investigations already done at local levels.

4.3.1 Investigation of a maternal death (institutional and field)

Regardless of whether a death occurs in an institution (public or private hospital) or outside of a facility (as in a clinic, the home or during transportation), the investigation is carried out in the hospital as well as in the field/community (including in the tea estate), where the woman was resident and where she may or may not have used the health service. In the extremely rare instance of the death of a woman who had not at all used hospital services, the investigation is only in the field setting. The first step of a maternal death investigation is notification.

Maternal death notification

As seen earlier, the strong health system in Sri Lanka includes a robust health information system that incorporates formal maternal death surveillance. This is
further supported by well-established vital registration. The MDR is an integral component and an active form of surveillance in maternal death surveillance. One of the features of maternal death surveillance in Sri Lanka is the notification of all maternal deaths, initiated in 1989, when a gazette notified that all practitioners providing care to women in the country, both at institutional and field levels, were legally bound to notify maternal death events to the FHB, the focal point in maternal death surveillance. Notification involves informing of all deaths that fulfil the criteria to the relevant authorities, in a uniform manner and without delay, for necessary action. The criteria for notification are all deaths (irrespective of cause) of women of reproductive age (15–49 years) during pregnancy and until one year after termination of pregnancy. This includes all confirmed maternal, late maternal, pregnancy-related and other reproductive age female deaths. Such a wide notification range will ensure that all probable maternal deaths are captured by the surveillance system. The procedure for notification is described as an integral part of the MDR which in turn is an integral part of maternal death surveillance.

Institutional (hospital) investigation of maternal deaths

As soon as a maternal death occurs in an institution (government or private hospital), or outside the hospital if the deceased had used its services, the head of the institution takes custody of the bed head ticket (BHT) and all documents related to the management of the deceased. All the pages are numbered and the original document is made available for relevant officers/review meetings for the investigation procedure. The BHT is not allowed to be reproduced or taken out of the office of the head of the institution, and extraction of information from the BHT is only permitted within the office premises.

It is compulsory to conduct a postmortem in all cases of maternal deaths as per the circular issued in 2008 by the Secretary to the Ministry of Justice and Law Reforms to all coroners, and the circular issued by the Director General of Health Services (DGHS) in 2011. A copy of the postmortem report is issued by the Judicial Medical Officer (JMO) to the DGHS, Director FHB and head of the hospital where the maternal death occurred. Coroners are requested to notify such deaths to the Regional Director of Health Services (RDHS) and the head of the institution after inquiry into sudden deaths.

The head of the institution then notifies the death within 24 hours by telephone, fax or e-mail to the following officers: Director MCH (FHB), provisional and regional directors of health services (where the institution is located), the Medical Officer of Health (MO-H) (where the deceased resided), and head/s of the institution/s that had been involved in the management of the woman.

Investigations are performed by each institution involved in the management of the deceased woman. This is conducted within 14 days of occurrence of a maternal death to facilitate acquiring fresh information, and is the responsibility of the head of the institution. The investigation is carried out by a team comprising the head of the institution as the team leader, the consultant obstetrician and gynaecologist or the relevant specialist of the hospital unit in which the death
occurred, and any other relevant consultant who managed the woman (physician, surgeon, anaesthetist, psychiatrist etc.), medical officer/s who attended the deceased woman, and a JMO. When relevant, the following may also be involved: MO in the ward/labour room, grade I nursing officer/nursing officer in charge of the blood bank, head of the institution of hospitals where the patient was managed before transfer, MO-MCH of the district where the woman was resident and where the hospital is situated, MO-H from the woman’s area of residence, and the PHM from the area of residence.

The death is discussed in detail to identify precisely the circumstances that led to the death. The consultant obstetrician and gynaecologist or a senior clinician presents the clinical case management scenario. The area PHM, MO-H and MO-MCH supplement information related to the field health service provision to provide the total picture and to explore the factors that may have led to the three delays. Deficiencies in the management of the deceased woman are identified, discussed in detail and addressed with feasible preventive measures both at institutional and field level. No-name, no-blame policy and confidentiality are strictly maintained at the review.

A structured generic report of maternal death investigation at institutional level is prepared, covering all information as well as views/comments and follow-up activities carried out. The consultant obstetrician and gynaecologist or the relevant specialist of the hospital unit in which the death occurred, and the head of the institution are responsible to ensure the completeness of the report and relay it to specific health officials in the hierarchy of the health system. The head of the institution also ensures that these deaths are reported through the prescribed formats (Monthly Report on Maternal Statistics and Quarterly Indoor Morbidity and Mortality Return). For every death, it is ensured that pregnancy and/or childbirth is mentioned as an underlying cause in the death certification/declaration. The head of institution is responsible to ensure that all actions recommended by the investigation team are carried out.

Field (including estate) investigation of a maternal death

When a maternal death occurs, whether in or out of a hospital, the area PHM where the deceased was resident (where she may or may not have used the services) immediately notifies the MO-H. The MO-H may receive a maternal death notification directly from the head of the institution where the death occurred or from the RDHS/MO-MCH of the district to whom the death was notified. However, notification by the PHM can be considered the single most important step in maternal death surveillance as it is likely to be the highest notification rate.

The MO-H informs the relevant authorities that it is compulsory to conduct a postmortem on all maternal deaths as per legal requirements. If a copy of the postmortem is necessary, the MO-H informs the Director of MCH and can obtain postmortem details from the JMO. All relevant records are maintained and kept safely in the office of the MO-H until the investigations and review meetings are over.
The MO-H notifies maternal deaths to the FHB, Provincial Director of Health Services (PDHS) and RDHS within 24 hours by telephone, fax or e-mail using a standard format. The telephone message is confirmed by a letter containing the following information: name of the deceased, her mother, address, PHM area, MO-H area, RDHS area, date of death, place of death, estimated cause of death, name and designation of the informant, and date informed. If the woman was temporarily resident in an MO-H area, the officer also notifies the death to the MO-H area of the mother (and where the deceased was registered as an eligible female). In cases of deaths within one week of discharge from a hospital, the MO-H notifies the death to head/s of the relevant institution/s. All deaths are reported through the Quarterly Maternal and Child Health Return, a component of the HMIS.

In Sri Lanka, a significant proportion of the population resides in estates. If a maternal death occurs in an estate it is notified to the PDHS, RDHS, the MO-H and the Regional Health Manager of the Plantation Trust. The MO-H will in turn notify the death to the Director MCH as described earlier. The MO-H and MO-MCH jointly investigate maternal deaths with the participation of a Public Health Nursing Sister, area PHM and the Regional Health Manager. The team visits the residence of the woman and proceeds with the field investigation, as reported below.

4.3.2 Review of investigated maternal deaths (district and national level)

District Maternal Mortality Reviews

Half yearly district reviews are organized by MO-MCH on behalf of the RDHS in January and July. The District Maternal Mortality Review team comprises relevant officers and health staff chaired by the PDHS/RDHS. The circumstances that led to each death investigated are identified at the district level and reviewed using the three-delays model; remedial measures are identified to improve the availability, accessibility, utilization and quality of field health-care services and essential obstetric services. At the end of the review the MO-MCH records the deficiencies identified and actions taken/to be taken and forwards these to the PDHS/RDHS (MCH). Minutes of the district review are prepared by the MO-MCH and sent to the PDHS, Director (MCH) and the relevant ministry/ institutions. These minutes are discussed at the next district review of maternal deaths.

National Maternal Mortality Review

A review of all deaths investigated and discussed at district level is conducted annually at the national level, with the participation of experts from a broad constituency. The Director (MCH) in the Department of Health and the PDHS organize this annual review in a district with the participation of representatives from professional colleges including the Sri Lanka College of Obstetricians and Gynaecologists, Sri Lanka College of Anaesthetists, College of Physicians, Sri Lanka College of Community Physicians and Sri Lanka College of Forensic Pathologists. The DGHS (if unavailable, the PDHS) chairs this meeting. The
participation of specific categories of health staff is mandatory at the National Maternal Mortality Review (NMMR) including those who were involved in the management of the deceased, as well as representatives of the district hospitals and peripheral units (whether or not maternal deaths occurred in their institutions).

A case scenario or summary compiled at national level is presented by the NPM to initiate the discussion. This includes information received both from the field and institutions. All cases are studied in detail and pertinent issues are highlighted. Individual maternal deaths are presented by the MO-H (field part) and the visiting obstetrician/ gynaecologist or the relevant specialist (institutional part). It is the responsibility of the head of the institution and the specialist of the unit where the woman was managed to ensure that a detailed presentation is made at the NMMR.

All deaths are discussed according to the three-delays model (to assess whether there was a deficiency in seeking medical care, reaching a health facility or treatment at the health institution or point of service). This is conducted as a modified clinical audit evaluating the care the deceased woman received against locally applicable protocols on clinical conditions. Due consideration is given to availability of logistics and health-care facilities. The final decisions regarding the category of maternal death, preventability and measures that should have been taken are made by the NMMR panel of experts. Following the review, minutes are prepared by the NPM for Director MCH and sent to the relevant district and provincial officers. The RDHS duplicates these minutes and sends copies to the relevant curative institutions and the MOH. Following the NMMR, the national statistics on maternal mortality are issued by the FHB before the end of the next year (Figure 1).

Figure 1. The processes involved in the investigation of maternal deaths in Sri Lanka
4.4 Follow-up actions taken and outcome of maternal death reviews

One of the clearest outcomes of the MDR has been the overall improvement in health care for women in pregnancy and childbirth by addressing the factors for the three delays, which in turn contributes to reducing maternal mortality. Although the decline in MMR is attributed to a host of factors and initiatives, it is reasonable to assume that the MDR and maternal surveillance system has played a significant part in this success. MMR for Sri Lanka declined from 41.6 per 100,000 live births in 2009 to an estimated 16.7 per 100,000 in 2011. Based on the findings of the MDR, besides ensuring emergency obstetric care, effective interventions have been introduced to prevent morbidity and mortality due to induced abortions.

The MDR revealed that, in spite of the impressive decline in maternal mortality, the majority of deaths remained preventable, and therefore remedial and preventive measures need to be further improved. Some of the issues raised in the MDR were:

- the need to go beyond the pregnant state and introduce an effective programme of pregnancy education and counselling, as a part of pregnancy preparedness;
- many nutritional indicators of women of reproductive age do not meet minimum standards, with iron deficiency anaemia and malnutrition common problems among pregnant women;
- inequitable distribution of services;
- deficiencies in quality of care;
- competing interests for health resources; and
- increasing costs of health care.

Following the reviews at various levels, and especially the NMMR, changes are implemented at individual, team or service level (sub-national and national) for identified service deficiencies.

After the NMMR, the MO-MCH organizes a meeting at district level for all MO-H/heads of institution and other relevant officers to implement the corrective actions decided at the NMMR. This meeting is chaired by the RDHS. The head of the institution calls for a separate meeting at the institutional level to discuss these minutes with the consultants/blood banks and other relevant staff in order to implement the highlighted activities.

At national level, three committees are formed to support the policy implementation:

- National Committee on Family Health, chaired by the Secretary of Health, meets every three months.
- Advisory Committee on Maternal Health and Family Planning, chaired by the Deputy Director General Public Health Services (DDG-PHS), meets every two months.
• Technical Advisory Committee on Newborn and Child Health, chaired by the DDG-PHS, meets every two months.

Some of the products and outcomes of the MDR include:

• human resource strengthening such as an increase in PHW, appointment of an additional medical officer, and a visiting obstetrician and a gynaecologist for a station to cover weekends;
• improved blood bank facilities;
• wider use of the partogram;
• improved emergency obstetric care;
• collaboration with the Registrar General to improve reporting of a maternal death, by including information on her pregnancy and childbirth in the death declaration;
• rapid communication system between field and hospital health-care workers;
• introduction of a modified three-delays model for a more detailed analysis of each death, and incorporation of more variables to suit the local context such as non-use of family planning and antenatal care services as part of the first delay;
• a simple electronic database to facilitate cross-tabulation for a more in-depth analysis;
• heightened awareness of maternal health through circulars, wall charts, etc.;
• development of several guidelines, e.g. for pregnant mothers leaving the hospital against medical advice, management of H1N1 infection, management of dengue haemorrhagic fever;
• evidence generated at the NMMR and the lessons learnt were incorporated in the Revised Maternal Care Package compiled and disseminated in 2012; and
• multiple strategies were launched to prevent maternal suicides, and innovative mechanisms introduced to promote contraception, especially emergency pills and lipid resuscitation therapy under local anaesthesia.

4.5 Strengths and weaknesses

Some of the strengths revealed in this study are listed below.

(1) A single system covers the entire country, including both the public and private sector, with a very clear role of the professional associations.

(2) Strong governance exists through departmental policies, mandates and regulations including clearly defined processes and procedures, exemplified by the mandatory notification and autopsy examination of all maternal deaths. Maternal mortality surveillance is an integrated process governed by the DGHS, who oversees health-care service delivery both in the state and the private sector. The general circular
issued in 1996 on maternal mortality surveillance is under review to take account of changes in maternal care service delivery.

(3) The maternal death investigations, review and resulting surveillance capitalize on and optimize the strong MCH service delivery system, which is backed by a well-developed vital registration health information system.

(4) The MDR is recognized as a continuous quality improvement process of maternal and newborn health services. A “no-name no-blame” approach to ensure total confidentiality and that the process is not a fault-finding exercise is adopted in all the steps of maternal mortality surveillance in the country. It has inculcated a culture of accountability among health providers.

(5) This approach has also nurtured a strong spirit of team work, with collaboration among many stakeholders in the health sector.

(6) The model of an action-oriented process that makes recommendations and ensures follow-up actions has shown tangible results that are motivating for all parties concerned.

(7) As the only centrally mandated maternal death audit, it has been given strong visibility and priority, and resources are provided accordingly.

(8) It has been highly accepted by politicians, administrators, professional colleges, all categories of health-care workers and the general public.

Some of the weaknesses and challenges that need to be addressed are the following:

(1) There are still gaps in the data and problems of under-reporting in the vital registration system (which have since been addressed).

(2) There is a need for better quality in autopsy examinations and reporting.

(3) The lack of legal immunity has also been cited as a weakness.

(4) There should be more accountability and commitment at provincial and district levels to conduct maternal death investigations and implement recommendations.

5. Discussion

Sri Lanka has taken impressive positive steps to institutionalize the process of MDR, introducing facility-based maternal death reviews with assured confidentiality as early as the 1980s and incrementally improving its quality and scope. The approach to cover the whole country with a single system is an advantage, and when compared with countries such as India, Indonesia and Nepal, there is less disparity in implementation. In this regard, the experience of Sri Lanka is comparable to that of Malaysia, which is not surprising as there are some common characteristics – both are middle-income, medium-sized countries with a strong health system, who have successfully reduced
maternal mortality in the past several decades; and both have been used as examples for developing countries to emulate. The achievement of Sri Lanka is remarkable considering the 30 years of strife it underwent due to the civil war.

The use of three MDR methods is appropriate in the context of this single nationwide model; facility-based maternal death reviews represent the overall method, supported during the investigation stages by verbal autopsy, and clinical audits. All methods feature confidentiality: information is collected at the local level confidentially and then assessed by a highly qualified, multidisciplinary independent group at the national level, involving the private sector (usually represented through a professional association). Needless to say, this highly organized and sophisticated model incurs considerable costs, in addition to good governance and management support.

The strong governance in the MDR in Sri Lanka is evident from the solid role and authority vested in the FHB, and the direct and committed role played by the director and other high-level officials. Such strong governance with mandates and regulations may not be unique to Sri Lanka, but two of its policies/rules deserve special mention as they are unique, at least in the South-East Asia Region: mandatory notification of maternal deaths and mandatory autopsy examination. In contrast, in the Malaysian experience, religious and cultural constraints make autopsies difficult to conduct although the committee on confidential enquiries into maternal deaths has recommended that they become mandatory.

The effective health system in Sri Lanka, established over several decades, is clearly an excellent context for the MDR. Included in the health system is the crucial building block of the HMIS, which will be gradually improved for maternal health and MDR. This is further supported by a robust vital registration system; indeed Sri Lanka is one of the few countries in the Region (Thailand is another) that has good coverage of both birth and death registration. This study has highlighted how these two elements, along with mandatory notification of every maternal death, form the central components of the national maternal death surveillance system.

The fact that there are various levels of review conducted for each maternal death depicts the detail and depth of the MDR in Sri Lanka, which is also the approach used in Malaysia. In Sri Lanka, the levels are termed differently: a “maternal death investigation” is conducted at the local level (which may be community/field level or in a facility, usually a hospital); every such investigated death is again subjected to a “maternal death review” at district level every six months, and every year at national level. Such a comprehensive system is another factor for the high costs of this approach.

The confidentiality of the MDR has been an advantage, and cited by all countries and institutions conducting such MDRs. Besides lending credibility, it also motivates the health staff and therefore ensures as complete a report as possible. The study revealed that the lack of legal immunity is a weakness. One reason why countries do not include a representative of the lay community is the fear of litigation. While no cases of litigation related to MDR were cited, legal immunity does not appear to be a feature of any MDR.
As in the experiences of countries and states that implement MDRs and CEMD (such as South Africa, Malaysia and Kerala in India), the multidisciplinary team to conduct the MDR has been found to be a crucial feature. In the context of Sri Lanka, with mandatory autopsy for all maternal deaths, the forensic pathologist and judicial medical officer have an important place in the MDR team or committee. The representation of a professional association through the College of Obstetricians and Gynaecologists is another strong feature, and this is also the case in Kerala.

It is surprising that there is as yet no institutionalized or formal system for audit of severe maternal morbidity or “near-miss” cases, since Sri Lanka is clearly ready to embark on this given its relatively small number of maternal deaths. It is however reasonable to assume that near-miss audits are carried out in some hospitals on the initiative of the specialists or the MDR committee. In countries such as the United Kingdom, South Africa and Malaysia, CEMD has been expanded to “near-miss” audits because the number of maternal deaths is not adequate to gain lessons to prevent future deaths from the same causes and under similar circumstances.

Like other countries, Sri Lanka has strengths as well as weaknesses in its implementation of MDR. While many of the problems encountered are likely to be similar in other countries, the problems of a single system that uses a sophisticated and comprehensive approach will be related mainly to uniformity of processes, costs and sustainability. This study found that the Sri Lanka’s greatest advantage was its strong health system with clear and strong governance.

6. Recommendations

From this study, the following recommendations are made.

(1) Continue the current work on MDR, and ensure that the investigations and review meetings are conducted regularly as scheduled, and that the minutes are disseminated promptly for implementation of recommendations.

(2) Study and address areas where there are weaknesses.

(3) The FHB to create a system of surveillance of maternal deaths in real time (as they occur) and not wait for the annual NMMR.

(4) Strengthen cooperation and linkages between the two main arms of the Ministry of Health – curative and preventive health services – so that a maternal death in a hospital is made known with the least possible delay by the responsible officers in preventive services, and so that better coordination of actions taken in follow-up to the review can be achieved.

(5) Start/institutionalize audits of severe maternal morbidity (near misses) to ensure that the range of cases and experiences cover as complete a profile as possible (especially medical causes, but also contributing factors) since the number of maternal deaths is too small to ensure this.
(6) Take all possible actions to ensure that the current system of MDR and surveillance is sustained.

7. Conclusions

In summary, the efforts made by Sri Lanka to institutionalize MDR are commendable. There is evidence that the system is working well, and it is reasonable to assume that this has contributed to the objectives of the MDR, i.e. to identify the cause of death, analyse in depth the circumstances that led to the death, and take remedial action to avert similar deaths in future.

Effective maternal health services and the system of MDR are part of Sri Lanka’s overall remarkable health status. This has been made possible through policies that ensure easy access to medical services for the whole population, mass education for women and mothers to make use of these services, and a continuous policy-driven process of behavioural change that has made Sri Lankans highly aware of illness, for which readily seek care.

The experience of Sri Lanka in MDR can be used as an example by other countries that wish to embark on a nationwide system that uses facility-based reviews with assured confidentiality.
A study on the implementation of maternal death review in Sri Lanka
A study on the implementation of maternal death review in Nepal
A study on the implementation of maternal death review in Nepal
WHO Library Cataloguing-in-Publication data

World Health Organization, Regional Office for South-East Asia.

Maternal death review in selected countries of South-East Asia Region.


© World Health Organization 2014
All rights reserved

Requests for publications, or for permission to reproduce or translate WHO publications – whether for sale or for noncommercial distribution – can be obtained from SEARO Library, World Health Organization, Regional Office for South-East Asia, Indraprastha Estate, Mahatma Gandhi Marg, New Delhi 110 002, India (fax: +91 11 23370197; e-mail: searolibrary@who.int).

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers’ products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

This publication does not necessarily represent the decisions or policies of the World Health Organization.

Printed in India
Table of Content

Abbreviations................................................................................................................ iv
Executive summary.............................................................................................................. v
1  Introduction .................................................................................................................. 1
2  Background ................................................................................................................... 2
   2.1 Maternal death review – the methods ................................................................. 2
   2.2 Health-care delivery in Nepal................................................................................ 2
   2.3 Development/evolution of maternal death review in Nepal ......................... 3
3  Objectives and methodology ....................................................................................... 3
   3.1 Objectives ............................................................................................................... 3
   3.2 Methodology ........................................................................................................... 4
4  Findings .......................................................................................................................... 4
   4.1 Findings from the historical development of maternal death reviews ............. 4
   4.2 Findings from the literature review .................................................................... 5
   4.3 Findings from stakeholder interviews .................................................................. 6
   4.4 Findings from the National Workshop on Maternal and Perinatal Death Review 9
   4.5 Summary of findings ............................................................................................. 13
5  Discussion ..................................................................................................................... 14
6  Recommendations ....................................................................................................... 16
7  Conclusion ...................................................................................................................... 17
8  References .................................................................................................................... 18

Annexes
Annex 2. Terms of reference of the National Maternal Perinatal Death Review Committee 21
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC</td>
<td>antenatal care</td>
</tr>
<tr>
<td>CEMD</td>
<td>confidential enquiry into maternal deaths</td>
</tr>
<tr>
<td>DMPRC</td>
<td>District Maternal Perinatal Review Committee</td>
</tr>
<tr>
<td>DoHS</td>
<td>Department of Health Services</td>
</tr>
<tr>
<td>DPHO</td>
<td>District Public Health Office</td>
</tr>
<tr>
<td>EOC</td>
<td>emergency obstetric care</td>
</tr>
<tr>
<td>FHD</td>
<td>Family Health Division</td>
</tr>
<tr>
<td>GoN</td>
<td>Government of Nepal</td>
</tr>
<tr>
<td>HMIS</td>
<td>Health Management Information System</td>
</tr>
<tr>
<td>ICD</td>
<td>International Classification of Disease</td>
</tr>
<tr>
<td>ICU</td>
<td>intensive care unit</td>
</tr>
<tr>
<td>MoHP</td>
<td>Ministry of Health and Population</td>
</tr>
<tr>
<td>MDG</td>
<td>millennium development goal</td>
</tr>
<tr>
<td>MDR</td>
<td>maternal death review</td>
</tr>
<tr>
<td>MMR</td>
<td>maternal mortality ratio</td>
</tr>
<tr>
<td>MPDR</td>
<td>maternal and perinatal death review</td>
</tr>
<tr>
<td>NMMMS</td>
<td>Nepal Maternal Mortality and Morbidity Study</td>
</tr>
<tr>
<td>NMPDRC</td>
<td>National Maternal and Perinatal Death Review Committee</td>
</tr>
<tr>
<td>SBA</td>
<td>skilled birth attendants</td>
</tr>
<tr>
<td>SHP</td>
<td>Sub Health Post</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
Executive summary

The Government of Nepal has put in place several initiatives to improve maternal and child health, including efforts to reduce maternal deaths that include a maternal death review or audit currently being implemented in 16 hospitals.

**Objectives and methodology:** This study aimed to elucidate the past and current efforts of MDRs in Nepal. The specific objectives were to document Nepal’s experience in implementing MDR; provide an analysis of the implementation of the MDR; and make recommendations for strengthening and institutionalizing MDR. Four methodologies were utilized: (1) a review of the development and evolution of the formal MDR efforts; (2) a desk review of published and unpublished papers; (3) in-depth interviews with stakeholders; and (4) a two-day national workshop on Maternal and Perinatal Death Review.

**Findings and discussion:** From the review of documents on the evolution of MDR in Nepal, the formal system of auditing maternal deaths is limited to facilities (mainly hospitals). Feedback from the 16 hospitals currently implementing MDR as obtained from interviews and the national workshop has highlighted several strengths, opportunities and also weaknesses and challenges. The review of published and unpublished literature revealed that several different approaches to MDR have been taken, which include ‘brought-in-dead’ analysis, confidential inquiry, near-miss analysis, community verbal autopsy, and facility-based death review. Most MDR-implementing hospitals are either central hospitals or referral centres with high patient load and inadequate human resources. MDR has led to several positive trends, such as funds generated by hospitals for needy women, better coordination for good referral, and commitment to quality services. Stakeholders have varying perceptions of the implementation and processes of the MDR in the 16 hospitals. Besides the findings about the MDR process itself, this study has also shown that maternal deaths occur due to a variety of factors, which the MDR is able to reveal. Although the formal MDR system in Nepal is limited to facilities, there are opportunities for community-based reviews as well.

Adequate information is crucial to the conduct of MDR; however, information from patient records and case documentation in facilities is poor. Collecting data from the community through verbal autopsy is also challenging. The MDR must not be perceived as threatening to the health provider and must not have any punitive intent. The mixed responses received from key informants regarding the MDR indicate that this system is being implemented with varying degrees of success in the different hospitals; this is not surprising since their strengths and limitations will differ. The multi-disciplinary composition of the MDR team is a strong point in all hospitals since the factors that led to deaths and the remedial actions may reside in any department or service. The perception of stakeholders that there is room to improve the MDR is inevitable given the different capacities of the hospitals. The MDR form being too long is a common problem. The experience of near-miss audits in Nepal was initiated as clinical case reviews by the medical specialists.
**Conclusions and recommendations:** MDR has contributed to a better understanding of maternal deaths in the country. The recommendations are to (1) revise the organizational structure to facilitate the MDR, such as more regular meetings to review maternal deaths or its findings; (2) improve the capacity of human resources, motivate staff and allay their fears and reservations; (3) provide resources to hospitals including sufficient computers and a networking system; (4) develop the computerized hospital information system, with user-friendly forms and ensured confidentiality; and (5) review/audit deaths that occur outside the facility; efforts by individual hospitals and doctors to conduct near-miss reviews must be encouraged to continue.
1. Introduction

In its efforts to reduce maternal deaths and improve maternal and newborn health, the Government of Nepal (GoN) in its National Health Policy 1991 identified safe motherhood as a priority programme. A National Safe Motherhood Policy was formulated and endorsed by the Ministry of Health in July 1998 (Department of Health Services [DoHS] Family Health Division [FHD], 1998).

For the monitoring of the Millennium Development Goal (MDG) 5 – improving maternal health – one of the two indicators is the maternal mortality ratio (MMR), which countries are required to reduce by three-quarters from 1990 to 2015. The other indicator is universal access to skilled attendance at birth. Many countries in the South-East Asia Region including Nepal are making progress towards both these targets. But high maternal mortality remains a major problem in Nepal. The Nepal Demographic and Health Survey (NDHS) 2006 (Ministry of Health and Population, New ERA and Macro International Inc., 2007) gave the MMR as 281 per 100 000 live births. The Nepal Maternal Mortality and Morbidity Study (NMMMS) in 2008–2009 (Pradhan et al., 2010) conducted in eight districts indicated a similar MMR. Based on estimates made by the United Nations Maternal Mortality Estimation Inter-agency Group (MMEIG), the MMR for Nepal in 2008 was still very high at 380 per 100 000 live births. There has been an encouraging reduction of 56% from the MMR of 1990 (879 per 100 000 live births). With an annual reduction of 4.6%, Nepal is making progress towards achieving MDG5.

Two trends are observed: (i) disparities among regions and population groups; and (ii) a shift of the burden of maternal death from homes and communities to health facilities. For example, about 41% of maternal deaths occurred in health facilities in 2009 compared to 21% in 1998 (DoHS FHD, 1998; Pradhan et al., 2010). This, however, is probably an indication of more births occurring in facilities today compared with previous years.

Knowing the magnitude of maternal mortality is not enough to prevent further deaths. Understanding the underlying factors that lead to these deaths will contribute to designing remedial measures. Therefore an investigation through a maternal death review (MDR) or audit of all, or a sample of maternal deaths is called for, based on the fact that every maternal death has a story to tell. If uncovered, this story will throw light on the causes, characteristics and circumstances of the death. There have been efforts since 1990 to conduct maternal (and perinatal) death audits in Nepal. It was felt useful for a review to be conducted on these past and current efforts at MDRs.

The status of MDR in Nepal as reported at the Regional Workshop on Strengthening Capacity for Facility-based Maternal Death Reviews held in 2007 was as follows:

“WHO-supported facility MPDR [maternal and perinatal death review] was initiated in 2003 in 6 hospitals now covers 12 hospitals (3 central, 7 zonal and 2 medical college hospitals). MPDR experience helped to raise awareness among the staff, develop standard protocols, identify avoidable factors and ensure a declining trend of maternal deaths in hospitals. The following are perceived as challenges impeding the
institutionalization of MPDR in Nepal: inadequate commitment of staff, incomplete or inconsistent MPDR forms, high turnover of trained staff and absence of standard database system for recording MPDR. Plans lined up include development of standard MPDR database system with training of staff on data management and retraining on MPDR proper data collection; annual consultative review meeting, institutionalization and expansion of MPDR to other hospitals and medical colleges; and strengthening supervision and monitoring.”

2. Background

2.1 Maternal death review – the methods

Regardless of where they occur, there is a need to explore the causes of maternal deaths, identify the avoidable factors, missed opportunities and substandard care, and take evidence-based corrective actions to improve the quality of services. The pioneer of MDR, in the form of Confidential Enquiry into Maternal deaths (CEMD) is the United Kingdom. This has been emulated successfully by other countries, e.g. Australia, Israel, Malaysia and South Africa. The three main methods of MDR are CEMD, facility-based death reviews and community-based death reviews (also called verbal autopsy). The World Health Organization (WHO) publication Beyond the numbers: Reviewing maternal deaths and complications to make pregnancy safer (2004) describes five approaches for reviewing maternal deaths: (i) community-level verbal autopsy; (b) facility-based maternal death review; (c) confidential inquiry; (d) near-miss case review; and e) clinical audit.

2.2 Health-care delivery in Nepal

Any review of maternal deaths should involve the health-care delivery system, which has relevance not only to the processes of the review and the recommendations made, but also to the circumstances under which the maternal death (or near miss) has occurred.

Under the Ministry of Health and Population (MoHP), the Department of Health Services (DoHS) is committed to deliver preventive, promotive and curative health services throughout the country. The MoHP enables different levels of the health system to form a network under the DoHS.

The Sub Health Post (SHP) is the first contact point for basic health services in Nepal. The SHP is also the referral centre for community health volunteers and other programme activities conducted in the community. Each level above the SHP is a referral point in a network to the health post, primary health care centre, and the district, zonal, regional and tertiary care centre in Kathmandu (see Annex 1). Despite a well-defined health service delivery system, the referral system does not work optimally because of geographical difficulty, cultural norms and a lack of appropriate knowledge on the health system among the community, which can be factors for maternal death.
Over the last decades, the GoN has implemented a series of interventions at the community level to create awareness and increase demand for health care in facilities to improve the quality of reproductive health services, including avoidance of maternal death. In its efforts for safe motherhood, the GoN implemented several policies, strategies and programmes to reduce the three delays that lead to lack of care and contribute to maternal death: health education and awareness-raising to encourage women to seek care (the first delay); reduce barriers to ensure access to services (second delay); and improve quality and acceptability of health services to motivate the seeking of care (third delay). There has been a three-fold increase in the implementation of basic emergency obstetric care (EOC) since 2005, and comprehensive EOC has more than doubled; however, the number of facilities providing these services still falls short of the United Nations recommended standards (Pradhan et al., 2010).

An MDR tries to uncover factors leading to death in each of the three delays. Shortfalls in quality of service leading to the third delay can be remedied by improving quality.

2.3 Development/evolution of maternal death review in Nepal

As mentioned earlier, the past several years have seen an increase in the number of maternal deaths in facilities, which is likely to be a reflection of more women delivering in facilities than before. Therefore the efforts of the Government towards formalizing MDR in Nepal have focused largely on facility-based reviews and audits. The initiative began in the early 1990s in the Paropakar Maternity and Women’s Hospital. In 1998, as part of the NMMMS, MDR was implemented in three other hospitals – Okhaldunga Mission Hospital, Lumbini Zonal Hospital and Seti Zonal Hospital. In 2003, the DoHS with the support of WHO made efforts to standardize the MDR process. In the same year, a national Maternal and Perinatal Death Review Committee (NMPDRC) was set up. This Committee held its first meeting in June 2003, and recommended that the MDR be introduced in six hospitals. The number expanded to 12 by 2006, and currently stands at 16 out of the total of more than 100 hospitals in the country. The progress is described under Findings in Section 4.

It is to be noted that thus far, the formal MDR system/initiative is only for deaths occurring in facilities, although from literature reviews, there have been separate and unrelated efforts to conduct community-based reviews (also described in Section 4).

3. Objectives and methodology

3.1 Objectives

This study aimed to elucidate past and current efforts of maternal death audits in Nepal. The specific objectives were to:

- document Nepal’s experience in implementing MDR;
- provide an analysis of the implementation of the MDR; and
- make recommendations for strengthening and institutionalizing MDR.
3.2 Methodology

Four methodologies were utilized in the study:

(1) A review of the development and evolution of the formal MDR efforts through an analysis of documents and records of facilities to trace the progress of these efforts, including the setting up of the NMPDRC and the activities carried out under its guidance.

(2) A review of published and unpublished papers. Published papers were searched on the Internet using key words, “maternal death review”, “verbal autopsy”, “near miss”, “confidential inquiry” and “Nepal”. A few papers from the local journal were also explored, and reports available in the DoHS library. The papers presented in national and international conferences were collected from conference proceedings, and personal communications with selected obstetricians, gynaecologists and researchers.

(3) An in-depth interview with stakeholders was organized to obtain relevant information from key informants at the central, regional, zonal, and district level hospitals and medical colleges.

(4) A two-day national workshop on Maternal and Perinatal Death Review was organized by the FHD with technical and financial support from WHO. The workshop aims were to analyse and present maternal and perinatal deaths that occurred in 2008–2009 in hospitals where an MDR database had been set up; share the experience of MDR-implementing hospitals during this period; identify constraints; make recommendations to institutionalize MDR in hospitals; and to reorient the health personnel on the MDR system.

4. Findings

The findings of the study are presented in four parts according to the methodologies.

4.1 Findings from historical development of maternal death reviews

Because there has been an increase in the number of maternal deaths in facilities, MDRs in Nepal have focused largely on facility-based reviews and audits. The NMPDRC provides strong technical and managerial leadership for these reviews, which are carried out using a detailed and comprehensive questionnaire to gather information on eight aspects:

- locality where the death occurred;
- details of the deceased;
- admission details at the institution where the death occurred;
- antenatal care (ANC) and tetanus toxoid immunization for the current pregnancy;
- information on delivery, puerperium and neonatal care;
- interventions;
- cause of death; and
- case summary.

There has been a gradual expansion of the MDR to 16 hospitals although this number is still far short of the total number of hospitals in the country. Since its inception, the NMPDRC has convened two meetings (see Annex 2 for the terms of reference of the NMPDRC, and Annex 3 for the minutes of its first meeting). The NMPDRC has also enhanced its activities, with a web-based MDR data management system created in 2007. Capacity-building for hospitals conducting MDR has also been carried out, through a four-day workshop in 2009, regular on-site coaching in implementing hospitals, and a two-day coaching on MDR in 2010 for all 16 hospitals.

4.2 Findings from the literature review

Findings are derived from 11 published papers and 8 papers presented at conferences are summarized as follows.

Published papers

Confidential inquiry of maternal deaths (one paper) – this is a systematic multi-disciplinary anonymous investigation of all, or a representative sample of maternal deaths occurring in a given area. Shah (2007) conducted a confidential inquiry of two perimortem caesarean deliveries at the Kathmandu Medical College. In both cases (amniotic fluid embolism and peripartum dilated cardiomyopathy), mother and baby were saved because they were brought to hospital on time and received immediate advanced life support. Therefore essentially these were maternal “near misses” and not maternal deaths, but the author had published them under maternal death audits.

Near-miss mortality analysis (three papers) – cases of severe maternal morbidity or “near misses” occur in larger numbers than maternal deaths. A near-miss approach of reviewing maternal complications is based on the concept that the reviewers can speak to the surviving woman to obtain her views about what happened and the care she received. The three published papers found on near-miss mortality reviews were conducted during 2006 to 2010.

Community-level verbal autopsy (three papers) – verbal autopsy is a valuable source of information to understand why women die, particularly in areas where higher numbers of maternal deaths occur. Pradhan et al. (2010) conducted a maternal mortality and morbidity study using the verbal autopsy approach in eight districts covering almost all geographical areas of Nepal. These studies conducted in 1998 and 2008 indicate that the pattern of maternal deaths was changing. While obstetric cause was the leading reason for death among women of reproductive age (21%) in 1998, it moved down to third in rank in the 2008 maternal mortality and morbidity study. Manandhar et al. (2010) also conducted a study using the community verbal autopsy approach and recommended a reduction in the uncontrolled use of oxytocics for augmentation of labour.
Facility-based verbal autopsy (three papers) – like the community-level verbal autopsy approach, facility-based maternal death review is also an important tool to trace the path of women who die, through the health-care system and within the facility, to identify any avoidable or remedial factors. The reviews were by Pradhan et al. in 2010 on 57 deaths, by the DoHS in 1998 on 31 deaths, and by Puri et al. on 72 deaths: all were hospital deaths.

“Brought-in-dead” analysis (one paper) – a woman can be brought to the health facility already dead. Padhye and Lakhey (2003) analysed seven brought dead cases at a tertiary-level maternity hospital in Kathmandu and found that the number of such deaths exceeded hospital maternal deaths during a one-year study period.

Unpublished papers

Community-level verbal autopsy was conducted on 69 deaths by questionnaire administered in Sarlahi district. Findings of the study were presented at the Third International Conference on Obstetric and Gynaecology in February 1997 in Kathmandu. There were three studies conducted in a hospital setting. One was a study of hospital maternal deaths carried out reviewing patient charts of 38 maternal deaths occurring over five years from April 1999 to 2003 in Tribhuvan University Teaching Hospital. In another study, the authors followed up pregnant women attending EOC until discharge for one year using patient charts, in which 16 women died. This paper was presented at the Ninth National Conference of the Nepal Society of Obstetricians and Gynaecologists on Postpartum Haemorrhage: Unseen Battle, Yet to be Won held in May 2006 in Kathmandu. This review was on 2228 booked and unbooked pregnant women attending EOC during January–December 2005. The third paper was on a review of 62 maternal deaths occurring during 1998–2006 in Tribhuvan University Teaching Hospital, presented in the same conference noted above.

Two papers were on facility-based reviews – one was of 45 maternal deaths that occurred in facilities in 2004–2007 in five hospitals. The findings were presented at the Tenth National Conference of the Nepal Society of Obstetricians and Gynaecologists: Improving Maternal and Neonatal Health in Low Resource Settings, held in March 2008 in Kathmandu. The other was on facility-based maternal death reviews of 57 deaths, for which a poster presentation of the findings was made during the First Global Symposium on Health System Research held in November 2010.

The Near-miss analysis approach was used to analyse 34 cases found during one year from 2006–2007 in Kathmandu Medical College, and these were presented at the same conference above. The same approach was used to analyse 36 near-miss cases found during 2008–2009 in the same college and was presented at the Eleventh national conference of the Nepal Society of Obstetricians and Gynaecologists in April 2010.

4.3 Findings from stakeholder interviews

A semi-structured interview was conducted with 27 stakeholders/key informants from 10 hospitals implementing the MDR and from the DoHS. The key informants
included 16 doctors, 4 staff nurses, 5 medical recorders and 2 programme managers. Their responses are categorized into five areas, as summarized below.

(i) Process of reviewing maternal deaths in implementing hospitals

Respondents from 4 of the 10 hospitals reported that they reviewed maternal deaths within 24 hours, with the hospital director taking the lead, and participation from consultants, registrars, hospital administration and medical records personnel. From the review meeting, gaps in service delivery are identified and remedial plans are prepared. In the majority of the hospitals, discussion on the maternal deaths was held within the maternity ward. Nurses in charge, obstetricians, gynaecologists, and medical records personnel jointly review the deaths. Assessment of medical records once a year is the basic way of reviewing deaths recorded in some hospitals. The deaths are generally recorded and reported to the medical superintendent. There is however no precise system to discuss, disseminate and get feedback in these hospitals.

Out of the total 16 hospitals that carry out MDRs, an MDR committee has been formed. Reviews are conducted regularly in 8 hospitals, 3 hospitals plan to form a hospital MDR committee and are committed to follow the standard MDR process suggested by DoHS, and in the remaining hospitals MDR is not functioning well despite identification of persons responsible for arranging MDR meetings.

(ii) Strengths and limitations of the existing Maternal Death Review process

Respondents perceived that implementation of the MDR system was good, that all hospitals should review maternal deaths regularly, and that it had become a good forum to assess the availability of health services and quality of care provided. Respondents also perceived that the existing MDR form had helped them to identify the cause of death and ways to prevent similar deaths in the future. The existing MDR form was also helpful for recording case histories. After filling up the form, they became more conscious about possible complications, the importance of information management and learnt lessons for the future. It is therefore being used as a tool for hospital management teams to improve quality of care.

Major limitations identified were a shortage of health personnel, high case load and the length of the MDR process. As the MDR form is very detailed, it is difficult to complete it in the hospital given the shortage of human resources. Respondents also reported that the lack of an electronic information management system for the MDR process requires more staff and more time to spend on paper work. Most respondents stated that it was not possible to obtain all the information required to fill up the form from existing tools, such as the level of education and employment status of the women. In addition, doctors did not always give sufficient time to enter important information in the patient chart, which was therefore often incomplete. Lack of coordination between doctors and nurses was also identified as a limitation of the existing MDR process.
(iii) Possible ways to improve the Maternal Death Review system

Most respondents felt that the Medical Superintendent, obstetrician/gynaecologist and paediatrician should set aside enough time to initiate the review of every maternal death. There should also be a mechanism to provide regular monitoring and feedback from the centre. Doctors working in wards other than maternity (such as emergency, medical and surgical wards) should be made aware of the MDR system so that there is less chance of missing maternal deaths occurring in other wards.

To ensure availability of information related to the MDR form, patient charts should be fully completed and hospitals should revise them to include all information required for the MDR process. Health personnel should thus ensure that sufficient time is given to filling in patient charts, including patient histories and other notes. Other suggestions were to deploy more health personnel; to form hospital MDR committees; encourage active participation of doctors, nurses, medical records staff and the hospital administration team; install a computerized hospital data management system; train all doctors, nurses and medical records personnel on the MDR process; and to provide incentives and rewards to those involved in the MDR process.

(iv) Use of Maternal Death Review information

About two thirds (18) of respondents reported that the information obtained from the MDR process is shared during hospital-level MDR committee meetings. The information is also used to revise and/or develop clinical protocols, to improve evidence-based care in hospitals and to serve in medical education. Two respondents also indicated that they had presented the findings of the MDR in national and international conferences. Many noted that the MDR process had facilitated the identification and management of high-risk patients, and as a result had contributed to reduce maternal deaths in the hospital. Three respondents reported that, following a few maternal deaths at the hospital due to lack of blood, the hospital initiated meetings with the nursing school and convinced them to donate blood when required. One respondent reported the improved availability of drugs and equipment following discussions with the hospital administration through an MDR meeting.

In five hospitals, key informants reported that plans to improve quality of care had been made after the MDR but unfortunately had not been followed up. They further reported that, while the recommendation regarding instruments and equipment had generally been implemented, recommendations for system improvement, human resources and staff attitude had not.

(v) Feasibility of integrating Maternal Death Review information in the Health Management Information System (HMIS)

Almost all (23) respondents felt that it was a good idea to integrate MDR information in the existing HMIS once the current hospital reporting tools were modified for this purpose. Three respondents said that integration of MDR information in the HMIS was crucial to improve the MDR system. For this to work, the MDR process should be consistent throughout the country and an aggressive action plan should be prepared to provide orientation on MDR to concerned personnel nationwide.
4.4 Findings from the National Workshop on Maternal and Perinatal Death Review

A two-day National Workshop on Maternal and Perinatal Death Reviews was organized by FHD with WHO financial and technical support. The objectives of the workshop were:

- to present the analysis of maternal deaths occurring in hospitals from 15 July 2009 to 15 September 2010;
- to share the experience of MDR-implementing hospitals on these maternal death reviews;
- to identify constraints and make recommendations to improve the MDR in hospitals; and
- to orient health personnel on the MDR system.

The methodologies adopted for the workshop were presentations by the implementing hospitals, discussion, group work and sharing of best practices.

4.4.1 Presentations made by the implementing hospitals

Eleven hospitals made presentations covering a total of 73 maternal deaths. A summary of the presentations is given below.

i) Paropakar Maternity and Women’s Hospital, Kathmandu. This hospital is the pioneer in MDR in Nepal. The MDR is conducted immediately after a maternal death occurs, and involves the obstetrician, nurses, anaesthetists and other consultants. The hospital director is also informed about the incident. From the MDR, the cause of death is assigned, contributory and avoidable factors (if any) within and outside the hospital are identified and recommendations made to the administration for corrective measures. Altogether 24,585 live births and 8 maternal deaths were reported during the review period.

ii) Okhaldhunga Community Hospital. This is a comprehensive EOC centre situated in the remote hill district of Eastern Development Region. Orientation on the MDR process was provided to health personnel including a doctor, nurse and medical recorder during implementation of the NMMMS in 2009; and onsite coaching was planned for 2010. During the review period, 482 deliveries were conducted, with no maternal deaths recorded.

iii) BP Koirala Institute of Health Sciences, Dharan, Sunsari. This is a specialized teaching hospital situated in a Terai district of Eastern Region, which has both neonatal and paediatric intensive care units (ICU). All the core health personnel working in the maternity and paediatric department received training and onsite coaching on MDR. The Institute regularly conducts departmental maternal and perinatal mortality meetings. A system of regular supervision by concerned personnel and those in charge exists to ensure the quality of service
provided in the respective departments. Guidelines have been introduced in all concerned departments to help capture all details required to fill in the MDR form. During the review period, 8326 deliveries were conducted, 27% of which were conducted by caesarean section. Twenty-one maternal deaths were recorded during the observation period.

iv) **Mahakali Zonal Hospital.** This hospital is situated in Kanchanpur district of Far-Western Region. Due to a heavy patient load, the hospital is facing a shortage of doctors and nurses. Although MDR orientation was provided, the system only became functional in this hospital in 2009. During October 2010 an onsite coaching on the MDR process was provided using the appreciative inquiry approach. After this, an MDR committee was formed and a decision made to organize biannual MDR meetings. During the review period, 2572 deliveries were conducted, with one maternal death due to retained placenta.

v) **Lumbini Zonal Hospital.** This is a referral centre for people living in Western and Mid-Western Regions. Orientation and onsite coaching on the MDR process was provided in the hospital, which has formed an MDR committee. Since the transfer of the obstetrician, the MDR process has halted. Despite no formal MDR meeting, informal discussions within the maternity department are held and from the proactive action of the medical recorder, FHD has been receiving the reports required by the MDR system. During the review period, 5872 deliveries were conducted in this hospital, 1407 of which were conducted by caesarean section. Eight maternal deaths occurred during the observation period. Hospital information indicates that the MMR has been declining in this hospital.

vi) **Dhawalagiri Zonal Hospital, Baglung.** This is a comprehensive EOC centre situated in the hilly district of Western Region. Orientation on the MDR process was provided to selected health staff, including the obstetrician, staff nurse and medical recorder during implementation of the NMMMS in 2008–2009. As a continuation of the study, this hospital was identified as an MDR-implementing hospital. FHD planned to conduct onsite coaching in this hospital during 2011. During the review period, 1540 deliveries were carried out, 48 by caesarean section. Two women were brought in dead (one postpartum haemorrhage and one eclampsia with heart disease) were identified at the hospital. Hospital participants who attended the training considered that the reason for so few maternal deaths at the Dhawalagiri Zonal Hospital could be because most of its staff are trained skilled birth attendants (SBA) and almost all the health centres at the periphery have at least one SBA. Increased institutional delivery, increased referral from the peripheral institutions on time, in addition to the availability of 35 SBA-trained workers, were other reasons for the low maternal death rate in the hospital and the community in this district.

vii) **Mid-Western Regional Hospital, Surkhet.** This hospital, situated in the Surkhet district of Mid-Western Region, had been recently upgraded from district to regional hospital, although not all medical doctor posts were yet filled. A
facility-based MDR process was implemented in this hospital as a part of the NMMMS in 2008–2009. Onsite orientation on the MDR process had been provided to health personnel working in the maternity and paediatric wards. During the review period, 2147 deliveries were conducted, 600 EOC cases managed and one maternal death occurred.

viii) **Seti Zonal Hospital.** This hospital is an SBA training site situated in Far-Western Region. The MDR system was implemented in this hospital, with orientation on the MDR process conducted during the NMMMS in 2008–2009. An onsite MDR coaching using the appreciative inquiry approach was also conducted. During the review period, 5296 deliveries were conducted, 665 of which were by caesarean section. There were eight maternal deaths.

ix) **Tribhuvan University Teaching Hospital, Kathmandu.** This hospital has a long history of reviewing maternal deaths. MDR orientation and onsite coaching had been conducted; there is a functioning hospital MDR committee and MDR meetings are held immediately after each death. During the review period 3451 live births and five maternal deaths occurred in the hospital: two were direct and three were indirect deaths.

x) **Patan Hospital.** Patan Hospital is a specialized tertiary-level hospital situated in Lalitpur district. The MDR system is implemented and onsite orientation provided to all health personnel working in the maternity and paediatric wards. During the review period 10 836 deliveries were conducted of which 2779 were conducted by caesarean section. There were three maternal deaths.

xi) **Nepalgunj Medical College.** This college has a teaching hospital with 830 beds. The MDR system has been implemented in this hospital since 2006. Orientation on MDR has been provided to all doctors, nurses, medical recorders and other administrative personnel. The teaching hospital regularly organizes the review meeting of maternal and perinatal deaths and then sends the form to FHD. The process of MDR is that, first, each death is discussed within the department regarding the diagnosis, management, and avoidable factors within 24 hours of death. The case is then presented to the death review board and based on findings, action is taken. In this hospital, the MDR committee is committed to maintain records in line with the HMIS, and has ensured uninterrupted availability of essential drugs. For better performance, there should be some motivation and capacity-building of the health personnel. Specific plans to utilize trained manpower efficiently and strengthen the blood bank in the teaching hospital are crucial. During the review period 2822 deliveries were conducted, 12% of which were by caesarean section. There were six maternal deaths during this period.

**Issues raised**

These presentations raised issues, not only related to the conduct of MDR but to the issue of maternal deaths; many issues (especially resource shortages) related to both.
Table 1. Issues raised by the 11 hospitals implementing maternal death review

<table>
<thead>
<tr>
<th>Issue</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late arrival of patients in critical condition and after poor referral system</td>
<td>Orientation on timely referral should be provided to health personnel in the periphery and emergency and efficient transportation should be in place</td>
</tr>
<tr>
<td>Shortage of human resources to meet excessive patient load</td>
<td>Create new positions to meet patient load, fulfil all posts of technical staff and revise the organogram</td>
</tr>
<tr>
<td>Lack of multidisciplinary services</td>
<td>Posts for physicians and surgeons should be incorporated in revised organogram</td>
</tr>
<tr>
<td>Overcrowded wards</td>
<td>Establish a birthing centre in the periphery of the catchment area of the hospitals</td>
</tr>
<tr>
<td>Lack of proper coordination between departments</td>
<td>Improve coordination between departments in a hospital</td>
</tr>
<tr>
<td>Lack of motivation among health personnel to implement MDR</td>
<td>Provide incentives to health personnel and medical recorders engaged in MDR process</td>
</tr>
<tr>
<td>Lack of supportive supervision from the centre</td>
<td>Regular monitoring and feedback from centre to improve the quality of maternal health services in the hospital</td>
</tr>
<tr>
<td>Shortage of SBAs in some hospitals</td>
<td>Need clear policy to retain trained health personnel in the hospitals and provide SBA training to all doctors and nurses working in the MDR system</td>
</tr>
<tr>
<td>Most obstetrician and gynaecologist positions are vacant</td>
<td>Immediate initiation required from MoHP to fill vacant posts</td>
</tr>
<tr>
<td>Most hospitals lack specialized services such as ICU, neonatal ICU, comprehensive EOC, with incubators</td>
<td>Establish these specialized services in the MDR-implementing hospitals</td>
</tr>
</tbody>
</table>

4.4.2 Findings from the group work

Participants were divided into three groups to discuss what the ideal MDR should be, what impact has been seen, and what challenges are faced for institutionalizing MDRs. Their discussions are briefly summarized below.

Group 1: What is the ideal MDR process?

In summary, an MDR should identify the causes and factors related to the death, and it must not be punitive or place blame on anyone. Deaths are classified as either preventable or not preventable, and where it is preventable, the avoidable factors should be identified. Every MDR must be followed up with appropriate actions.
Group 2: Impact of MDRs – the evidence

Many changes in the health system were made due to the implementation of the MDR (see Section 4.5 below). Of particular note, funds have been raised to provide emergency referral to women who cannot afford it; the District Public Health Office (DPHO) remains committed to provide quality ANC and family planning services; and an ambulance service became available for emergency transportation.

Group 3: Challenges for institutionalizing the MDR system

There are shortages of mid-level and skilled health personnel who are trained in medical records systems and EOC; the annual budget allocated to the hospitals is not sufficient and no separate budget is allocated for MDR system strengthening. In addition there is a lack of emergency drugs, blood banks and ambulance services for referral, computerized hospital information systems, information, education and communication activities in the community, and no clear incentive or capacity-building activities to motivate health staff involved in MDR system management.

4.5 Summary of findings

• From the review of documents on the evolution of MDR in Nepal, there has been a formal system of auditing maternal deaths since the early 1990s, but this is limited to facility-based (mainly hospital) audits. There has been a gradual expansion of this formal system, and currently 16 hospitals are implementing the MDR.

• The review of the published and unpublished literature revealed that several different approaches of MDR are used: brought-in-dead analysis, confidential inquiry, near-miss analysis, community verbal autopsy, and facility-based death review.

• From the interview of stakeholders, it is perceived that there is room to improve the quality of maternal health services provided in hospitals. Availability of trained health personnel, specialized services, 24-hour availability of emergency drugs and blood products were reported to determine strongly the outcome of pregnancy and delivery. Mixed responses were received from key informants regarding the process and status of the MDR in the 16 hospitals. The three central hospitals, two medical colleges and two zonal hospitals reported that they regularly reviewed maternal deaths although the timing and process varied. The review meeting is generally led by a hospital director in which the consultants, registrars, hospital administration team, nursing and medical records personnel actively participate. In other hospitals, either the MDR committee is not active or discussion on maternal deaths is held only within the maternity ward. Heavy patient load and shortage of health personnel are perceived as the main constraints for reviewing maternal deaths in almost all the MDR-implementing hospitals.

• Issues related to institutionalization of the MDR process were brought up. One issue frequently raised was that the MDR form is too long. Related to this is the
difficulty of filling in the form because patient charts and other hospital recording tools do not contain much of the required information.

- From the two-day national workshop, most of the MDR-implementing hospitals were either a central hospital or referral centre at the periphery. Therefore high patient load and inadequate human resources were major challenges. The organizational structure of the hospitals is based on the population of the 1990s, which is not sufficient to manage the current population structure.

- The MDR in Nepal has led to several benefits. Hospitals have generated funds to provide emergency referral and other services to needy women who cannot afford them; there is better coordination with the DPHO to establish a good referral mechanism; the DPHO is committed to provide quality ANC and family planning services; an eclampsia ward has been set up; blood banks are better managed; an ambulance service has been arranged for emergency transportation; there is more use of oxytocics; magnesium sulphate is regularly available; there is proper recording and reporting, and SBA training for health providers; family members and the community are more aware of maternal health issues; and, most important, the overall quality of maternal health services has improved.

- Besides the findings about the MDR process itself, this study has shown that maternal deaths occur due to a variety of factors, and the MDR is able to reveal these. Prevention of maternal deaths requires many inputs including regular and complete ANC, creating awareness on maternal health in the community, expansion of birthing centres and basic obstetric services down to the rural areas and an efficient referral system; these are important issues that need to be addressed.

5. Discussion

This study underscored the fact that an MDR is a cyclical process consisting of identification of maternal deaths, data collection and interviews, analysis of findings, recommendations and action, and an evaluation of the whole process, the lessons learnt from which should shape future reviews of maternal deaths. From the cases described in this study and the processes involved, the MDR has centred on why the death occurred, whether it was preventable, and what could have been done to prevent it. The MDR must not be perceived as threatening to the health provider and must have no punitive intent. Therefore confidentiality ideally should be a feature of all forms of MDR, and not only the CEMD. It is important to explain to health providers that the factors contributing to the death must be analysed from all three delays, and not only the third whereby the care given by a health facility is not up to standard. Interestingly, this study did not reveal any finding on this, and no health provider expressed fear or feeling of being punished. The main thrust and goal of trying to identify preventable factors so that remedial actions can be taken must always be emphasized.
In this study, the most frequently cited challenge to the MDR is shortage of human and other resources. It must be remembered that a proper MDR implies costs, but the benefits justify these costs.

The administrative section of the facility may also be relevant to deaths occurring in facilities. The need for a multidisciplinary team to conduct the MDR was revealed in the study in Nepal. All implementing hospitals have such a team, which is a strong and crucial point because the factors that lead to a death and the remedial actions may reside in any department or service. The involvement of the hospital director and/or administrator is also significant since remedial actions almost always require management and leadership inputs.

Besides competence and skills, the staff involved in conducting an MDR need to be highly motivated, because this task is over and above their clinical patient care functions, and very often time consuming. In countries that have successfully implemented CEMD, such as the United Kingdom and Malaysia, a senior nurse manager in the hospital is appointed as the coordinator. This study raised the issue of providing incentives to staff involved in the MDR. There is little experience from other countries on incentives and rewards for those involved in reporting a maternal death or in the MDR, but there is anecdotal evidence that health professionals participating in MDRs have a sense of professional satisfaction and pride.

Shortage of other (non-human) resources is also highlighted in this study, both from the stakeholder interviews and the national workshop. Availability of drugs and blood were emphasized, as were services such as ICU, ambulance, ventilators and referral systems. Many of the hospitals were built several years ago and their needs have since outgrown their capacities. Heavy patient load and shortage of health personnel and physical infrastructure are not unique to Nepal, but a challenge faced by almost all developing countries.

The mixed responses received from key informants regarding the MDR process indicate that this system is being implemented with varying degrees of success in the different hospitals, which is not surprising since their strengths and limitations differ. The three central hospitals, two medical colleges and two zonal hospitals have regular reviews as might be expected, although the timing and process of reviewing the deaths vary.

A good MDR system also requires good and effective organization and leadership. This exists in Nepal in the formal MDR system with the NMPDRC, which is led by a very senior manager and has clear terms of reference. The study revealed that the NMPDRC had two meetings in a six-year period and this implies that each meeting would have audited a fairly large number of deaths. In countries where the number of maternal deaths is relatively low (United Kingdom, Malaysia) all maternal deaths are audited with no sampling. Indeed in these countries, CEMD has been expanded to “near-miss” audits because the low number of maternal deaths is not adequate to gain lessons to prevent future deaths from the same causes and under similar circumstances. While this is not yet incorporated into the formal MDR, there have
been near-miss investigations in hospitals as part of clinical audits. Meetings of the CEMD can be organized optimally to complete all audits within the planned timelines. Reports of the audits in these countries cover a period longer than one year (three years in the United Kingdom and two years in Malaysia).

There is also very little experience about the involvement of lay persons such as members of the public in the MDR team, although the state of Tamil Nadu in India has introduced this successfully. Confidentiality becomes the main issue for this policy. The possibility of litigation has led governments to take a reserved and conservative stand on this. In Nepal, while not explicitly stated, it appears that the membership of the MDR team is limited to hospital staff. An observation was made that the review would involve high levels of management if the initial review suggested that there could be a legal implication.

Needless to say, adequate information is crucial to conduct an MDR, and this study highlighted the paucity of information from incomplete patient records and poor case documentation in facilities. Collecting data from the community through verbal autopsy is also challenging, especially if the deceased was never in contact with the health system. The interview occurs after the death, resulting in problem of recall, and often the person being interviewed knows little about the events surrounding the death. The problem of the MDR form being very long was another expected response, especially from staff who were already overworked with other tasks. This is compounded by the paucity of information in patient charts. Again this is a common issue in other countries, and generally the design of these forms requires several cycles of trials and pilots before they are perfected to serve everyone’s interest. In designing this form, the requirement for confidentiality must be met.

The very encouraging changes and benefits generated by the MDR, highlighted in Section 4.5 above, will provide a higher level of motivation to those involved in the process, besides contributing to prevention of future maternal deaths. Another potential positive output could be the development or improvement of clinical practice guidelines to manage obstetric complications.

The formal MDR system in Nepal is limited to facilities (mainly hospitals). From the published and unpublished papers reviewed, there are opportunities for community-based reviews as well. There is clearly competence and interest to conduct MDRs, not only in hospitals (where even near-miss audits have been conducted) but also in the community. This level of interest and competence can be extended to nationwide coverage of the current MDR.

6. Recommendations

From this study, recommendations can be made to improve the current MDR system and processes from five broad perspectives.

1. **Organization and management.** There is a need to revise the organizational structure by increasing sanctioned health as well as medical records posts, to
facilitate the MDR, improve maternal health, reduce maternal deaths, and ensure regular supervision to hospitals from the centre. The current NMPDRC should be continued and its capacities improved. In hospitals where the committee and review teams are not very active, meetings to review maternal deaths or to review its findings should be conducted at regular intervals.

2. **Human resource capacity-building.** Although MDR activities have been carried out since the 1990s, no formal training on International Classification of Disease (ICD) coding or data management system has been provided to doctors and medical records personnel. Training on ICD 10 coding and advanced data analysis and management should be provided to these health staff. Because there are several issues related to this constraint and the inherent nature of the MDR, staff need to be motivated and their fears and reservations allayed. The issue of incentives should be considered with caution.

3. **Strengthening resources.** In terms of reducing maternal deaths, all hospitals should have resources to deal with deliveries and obstetric emergencies, including adequate blood bank services, ICUs, ambulances, drugs, etc. Hospitals designed to meet the needs of the 1990s need to be revamped and enhanced to meet current needs. Most of the MDR-implementing hospitals lack sufficient computers and networking systems to record and report MDR information, and funds should therefore be allocated to manage the administrative and logistic requirements.

4. **Improving data and information.** There is a need to develop a computerized HMIS to reduce the burden of paper work and standardize hospital admission and discharge sheets so as to record all information required to fill up the MDR form. Forms must be made user-friendly so that the staff do not feel overburdened in carrying out this task. Confidentiality should also be incorporated.

5. **Scaling up MDR.** Nepal has done well in instituting the MDR in some facilities/hospitals, and should consider building on this experience by expanding the MDR to other hospitals. Although most maternal deaths occur in facilities, there is a need to investigate and review/audit deaths that occur outside the facility. The current efforts of individual hospitals and doctors to conduct near-miss reviews must be encouraged.

7. **Conclusion**

The MDR has been institutionalized as a facility-based investigation in 16 hospitals in Nepal. Maternal deaths occurring outside of facilities are not captured in this formal system of investigation. However, hospitals and doctors, on their own initiative, do conduct community-based death reviews. These encouraging efforts by the Government and professionals in Nepal are opportunities for more to be done in MDR. They will not only contribute to a better understanding of maternal deaths in the country, but also to evidence for putting in place strategies and programmes to reduce maternal deaths, improve maternal health, and accelerate progress towards achieving MDG5.
8. References


Annex 1.

Organizational structure of the Ministry of Health and Population

<table>
<thead>
<tr>
<th>MINISTRY OF HEALTH AND POPULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPARTMENT OF HEALTH SERVICES</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIVISIONS</th>
<th>CENTRES</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td>NTC</td>
</tr>
<tr>
<td>CHD</td>
<td>NHFTC</td>
</tr>
<tr>
<td>FHD</td>
<td>NPHL</td>
</tr>
<tr>
<td>LMD</td>
<td>NCASC</td>
</tr>
<tr>
<td>LCD</td>
<td>NHECCIC</td>
</tr>
<tr>
<td>EDDO</td>
<td></td>
</tr>
<tr>
<td>PHCRD</td>
<td></td>
</tr>
</tbody>
</table>

Central Level
- CENTRAL HOSPITALS - 8

Regional Level - 5
- REGIONAL HEALTH DIRECTORATE - 5
  - Regional Hospital - 3
  - Sub-Regional Hospital - 2
  - Regional Training Centre - 5
  - Regional Medical Store - 5
  - Regional TB Centre - 1

Zonal Level - 14
- ZONAL HOSPITAL - 10

District Level - 75
- DISTRICT PUBLIC HEALTH OFFICE - 15
- DISTRICT HOSPITAL - 65
- DISTRICT HEALTH OFFICE - 60

Electoral Constituency Level - 205
- PRIMARY HEALTH CARE CENTRE / HEALTH CENTRE - 214

VDC, Municipality Level - 3973
- HEALTH POST - 679
- SUB-HEALTH POST - 3,134

Community Level
- FCHV 48,549
- PHC/ORC CLINIC 13,811
- EPI OUTREACH CLINIC 16,260

Figure 1b.1 Source: Administration Section, HMIS/MD, DoHs

Acronyms
- MD: Management Division
- FHD: Family Health Division
- CHD: Child Health Division
- EDDO: Epidemiology and Disease Control Division
- LMD: Logistics Management Division
- LCD: Leprosy Control Division
- PHCRD: Primary Health Care Revitalization Division
- NHECCIC: National Health Education, Information and Communication Centre
- NHTC: National Health Training Centre
- NTC: National Tuberculosis Centre
- NCASC: National Centre for AIDS and STD Control
- NPHL: National Public Health Laboratory
- FCHV: Female Community Health Volunteer
- PHC/ORC: Primary Health Care Outreach Clinic
- EPI: Expanded Programme on Immunisation

Annex 2.

Terms of reference of the National Maternal Perinatal Death Review Committee

1. The NMPDRC will serve as the National Body in formulating the policy decision in the implementation and expansion of the maternal and perinatal death review process in the health institutions for identifying substandard care and improving the quality of care in the health institutions in Nepal.

2. The NMPDRC office secretariat will be situated at Maternity Hospital, Thapathali.

3. The NMPDRC will identify assessors for reviewing the maternal and perinatal death records, from within the review committee members or from outside.

The NMPDRC will also be responsible for the following:

4. Ensure the implementation and expansion of maternal and perinatal death reviews as a method of evaluation of quality of care on an ongoing basis to improve services at health institutions (governmental, nongovernmental and private).

5. Provide technical assistance for the orientation trainings at the selected health institutions where the review process is to be instituted.

6. Ensure that maternal and perinatal death review process is initiated within 48 hours of death.

7. Devise a mechanism to review on an ongoing basis all maternal and perinatal death forms, forwarded by the selected hospitals where the review process is instituted.

8. Supervise and provide technical support to the District Maternal Perinatal Review Committee (DMPRC).

9. Organize data entry and analysis on an ongoing basis. Until the committee secretariat becomes fully established to take care of the data entry and analysis, FHD/Demography Section will be charged to take this responsibility.

10. Provide feedback to the DMPRC including policy-makers of Ministry of Health.

11. Mobilize resources from the Government and external donor partners.

12. Disseminate the findings of the reviews periodically.

13. Director General of DoHS can nominate new members or change the composition of the committee as per need.
Annex 3.

Minutes of first meeting of the National Maternal and Perinatal Death Review Committee, 16 June 2003

Present: Dr L.R. Pathak, Dr B. Lakhey, Dr G. Shakya, Prof. D.S. Malla, Dr K. Malla, Prof. D.S. Manandhar, Dr A. Rana, Dr K. Yonjon, Prof. S. Padhye, Prof. P.S. Shrestha, Dr D.R. Aryal, Dr V. Manandhar, Dr I. Basnet

Absent: Mr Ajit Pradhan, Mr M. Mool

The first meeting of the NMPDR Committee was held under the chairmanship of Dr Laxmi Raj Pathak, DG/DoHS. Dr Pathak welcomed all the members. He said that based on the experiences and lessons learnt from the MMM Study conducted in 1998 the DoHS/MoH had decided with support of WHO to initiate the process of institutionalizing standardized Maternal and Perinatal Death Reviews in selected hospitals in Nepal, in order to improve maternal and newborn care at health facilities. He also informed that Maternity Hospital had been given the responsibility for implementing and carrying forward this important task. However DoHS would support the coordination that would be required among the relevant Government institutions and nongovernmental organizations both at central as well as at district level. The main objective of this meeting was to obtain consensus on the draft terms of reference and also the proposed membership of the committee.

It was agreed that representatives from NSM [Nepal Safe Motherhood] Project and the United Nations Children’s Fund (UNICEF), Dr Indira Basnet and Dr Geetha Rana be included as members of the committee. Dr Kasturi Malla the Member Secretary, presented the implementation plan. She said that six hospitals had been selected for the first phase of implementation of MPDR and were as follows: Patan Hospital, TUTH, Maternity Hospital as well as Lumbini Zonal, Seti Zonal and Sagarmatha Zonal Hospitals. The next important activity to be initiated immediately was to review, revise and develop standardized MPD review tools and instruction manuals for which two technical working groups were to be formed.

As Dr Pathak had to leave for another important meeting, Dr Lakhey, the Deputy chair conducted the rest of the meeting. Dr Lakhey presented the draft TOR which were agreed upon with minor changes. The process of implementing maternal and perinatal death reviews was also discussed. Members were informed that WHO’s support would continue for expansion of MPDR process in other selected hospitals in 2004–2005. It was also proposed that a TOR for the district committee be drafted. Mechanism for providing quick feedback to districts was considered an important aspect that needed to be addressed.

Two Working Groups were formed for the development of tools.

**MDR Group**
1. Dr B. Lakhey
2. Prof. S. Padhye
3. Dr K. Yonjon
4. Dr A. Rana
5. Prof. D.S. Malla

**PDR Group**
1. Prof. D.S. Manandhar
2. Prof. P.S. Shrestha
3. Dr D.R. Aryal
4. Dr K. Malla
A study on the implementation of maternal death review in Nepal
A study on the implementation of maternal death review in Myanmar
A study on the implementation of maternal death review in Myanmar
# Table of Content

Abbreviations................................................................................................................................. iv  
Executive summary .......................................................................................................................... v  
1 Introduction .................................................................................................................................. 1  
2 Background ................................................................................................................................... 1  
  2.1 The maternal death review – methods .................................................................................. 1  
  2.2 Development of the maternal death review in Myanmar ....................................................... 2  
3 Objectives and methodology .......................................................................................................... 3  
  3.1 Objectives ................................................................................................................................. 3  
  3.2 Methodology ............................................................................................................................ 3  
  3.3 Other related studies .................................................................................................................. 4  
4 Findings .......................................................................................................................................... 4  
  4.1 Maternal death profiles from the related studies ........................................................................ 4  
  4.2 Organization .............................................................................................................................. 5  
  4.3 The reporting form .................................................................................................................... 6  
  4.4 Timing of the audit ..................................................................................................................... 7  
  4.5 Strengths and benefits ................................................................................................................. 7  
  4.6 Weaknesses and difficulties faced ............................................................................................ 9  
  4.7 Actions taken ............................................................................................................................ 10  
  4.8 Suggestions .............................................................................................................................. 10  
5 Discussion ....................................................................................................................................... 11  
6 Recommendations ......................................................................................................................... 13  
7 Conclusions .................................................................................................................................... 14  

Annexes  
Annex 1. Checklist for health facilities ........................................................................................... 15  
Annex 2. Data collection for maternal death review experiences ..................................................... 16
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 delays</td>
<td>First delay – deciding to seek care; second delay – difficulty in obtaining care, especially getting to a health facility; third delay – after getting to a health facility, inadequate, improper or no care given.</td>
</tr>
<tr>
<td>AMW</td>
<td>auxiliary midwives</td>
</tr>
<tr>
<td>ANC</td>
<td>antenatal care</td>
</tr>
<tr>
<td>BHS</td>
<td>basic health staff</td>
</tr>
<tr>
<td>CEMD</td>
<td>confidential enquiry into maternal deaths</td>
</tr>
<tr>
<td>ENC</td>
<td>essential newborn care</td>
</tr>
<tr>
<td>MCH</td>
<td>maternal and child health</td>
</tr>
<tr>
<td>MDR</td>
<td>maternal death review</td>
</tr>
<tr>
<td>MMCWA</td>
<td>Myanmar Maternal and Child Welfare Association</td>
</tr>
<tr>
<td>MMR</td>
<td>maternal mortality ratio</td>
</tr>
<tr>
<td>MPDR</td>
<td>maternal and perinatal death review</td>
</tr>
<tr>
<td>PPH</td>
<td>postpartum haemorrhage</td>
</tr>
<tr>
<td>RHC</td>
<td>Rural Health Centre</td>
</tr>
<tr>
<td>TBA</td>
<td>traditional birth attendant</td>
</tr>
<tr>
<td>TMO</td>
<td>Township Medical Officer</td>
</tr>
</tbody>
</table>
Executive summary

The maternal mortality ratio in Myanmar is still unacceptably high. To understand the underlying factors behind these deaths, a community-based maternal death review (MDR) using verbal autopsy was introduced in 2010 as a pilot in 10 townships. Although this initiative is relatively new, its assessment and a review of the current status of implementation will be beneficial to stakeholders.

Objectives and methodology: The general objective was to contribute to improving the quality of maternal health services in Myanmar through evaluation of the MDR. The specific objectives were to (1) describe and analyse the process of the MDR; (2) document and share Myanmar’s experience in its implementation; and (3) suggest measures to improve and strengthen the MDR in Myanmar. Ten townships implementing MDR were selected and, in each of these, a checklist was used for health facilities. An in-depth interview was carried out with various categories and levels of health-care providers.

Findings and discussion: All townships studied had established the structure and mechanism for the MDR. In terms of the audit process, many issues were raised related to the 30-page reporting form. In addition, these forms were in short supply, necessitating making copies. The prescribed timing of the audit, which is required by policy to be conducted within seven days of the death, led to unwillingness of the grieving families to give complete information. One major strength of the system cited was the fact that the audit could identify not only the cause of death, but also the contributing factors, especially causes of delay in getting care. This enabled health providers to identify strategies to prevent future deaths. Weaknesses and difficulties faced, besides the lengthy form, were management and logistical issues, especially transport costs. Several actions have been taken, mostly in improving the quality of service based on findings of the MDR, for example through health education. There is only one national initiative for MDR in Myanmar.

The study used two relatively straightforward tools; the outputs of these tools were largely opinions of the respondents, especially those who were involved in the care of the deceased women and, not surprisingly, these opinions are similar to those encountered in almost all MDR initiatives in other countries. The positive attitude and appreciation of the MDR by the township supervisory teams, who wanted the MDR to continue, can be seen as the clearest strength of this initiative. The heightened awareness among health staff and the community is another feature that portrays the success of the MDR. The weaknesses found in this study were not very different from those found in other countries, especially the problems of the reporting form. The lack of transportation underscores the issue of costs; it has to be accepted that any form of MDR, however simple and small, is not without cost. The difficulty faced in trying to do the review within seven days of death may be based on a very acceptable and valid reason, but the family in grief is not likely to offer information. The difficulty of obtaining information from the private sector is another universal problem. Overall, this first well-organized effort for the MDR is likely to be only a starting point for Myanmar, and will lead to more comprehensive MDR initiatives in future.
Conclusions and recommendations: The MDR in Myanmar has been implemented as planned, with strengths and weaknesses, based on which recommendations are to (i) review the reporting format and ensure adequate supply; (ii) conduct training and skill-building of midwives; (iii) strengthen health facilities in terms of adequate equipment; (iv) review the policy to conduct a verbal autopsy within seven days of death; (v) address problems of transport costs; (vi) ensure constant monitoring of the MDR; (vii) scale up the MDR to other townships; and (viii) strengthen advocacy for the MDR to sustain the positive and commendable actions that have been taken.
1. Introduction

Myanmar is aspiring to become a modern, developed country by meeting 12 national objectives in the political, social and economic arenas. One of the four social objectives is to uplift the health, well-being and education standards of the entire nation, and maternal and child health (MCH) has been accorded high priority in the National Health Plan of Myanmar. The last five years have seen major gains in maternal and newborn health with gradual reductions in maternal and child mortality. However, the maternal mortality ratio (MMR) is still unacceptably high. From the maternal mortality survey carried out by the Department of Health and the United Nations Children’s Fund (UNICEF) in 2004–2005, the MMR was reported as 316 per 100,000 live births. Based on estimates generated by the United Nations Inter-agency Group for Child Mortality Estimation, an encouraging trend is observed: MMR declined from 420 to 240 per 100,000 live births from 1990 to 2008. To further enhance efforts in reducing MMR, knowing the level is not enough, there needs to be an understanding of the underlying factors behind these deaths by conducting a maternal death review (MDR). A community-based MDR started in December 2010 to enable programme managers and other stakeholders to know the extent of MDR being conducted in the country. The results of this study are described in this document.

The status of MDR implementation in Myanmar as reported at the Regional Workshop on Strengthening Capacity for Facility-based Maternal Death Reviews held in 2007 was as follows:

“Community-based verbal autopsy and facility-based MPDR [maternal and perinatal death review] (includes review of medical records and postmortem reports) have been initiated in five townships from Sagaing Division as a project-based initiative starting from January 2007. The findings are disseminated for advocacy and action at the local, district and central level. The experience demonstrated that the process can explore avoidable medical and non-medical factors contributing to maternal deaths. Constraints included possible under-reporting of cases by TBAs [traditional birth attendants], AMW (auxiliary midwives) and midwives, and problems with obtaining the complete or correct information, especially if the data collector was involved in a particular case. Plans included the assessment of the costs and benefits in terms of information derived from the review, which was translated into actions and change; and use of the experience in subsequent reviews.”

2. Background

2.1 The maternal death review – methods

An MDR – also called a maternal death audit – is an approach to determine the causes and circumstances or factors surrounding a maternal death, an analysis of which can form the basis for recommendations to avoid similar deaths in future. MDRs are already established in developed countries, pioneered by the United Kingdom when it began confidential enquiries into maternal deaths (CEMD) many years ago.
Several methods of MDR are available, and the World Health Organization (WHO) guide *Beyond the numbers* (2004) describes the following five:

- Community-based maternal death reviews by verbal autopsies
- Facility-based maternal death audits/reviews
- Confidential enquiries into maternal deaths
- Clinical audits and
- Audits of severe maternal morbidity, or near-miss cases.

Many countries have institutionalized MDR by adopting one or a combination of these methods.

### 2.2 Development of the maternal death review in Myanmar

In Myanmar, maternal death data are collected by the Central Statistical Organization (CSO) as well as the Health Management Information System (HMIS) in the Department of Health Planning. Surveys have also been conducted by different sources to supplement these data. The Department of Health, MCH section, started country maternal death notifications in 2003. This has the advantage of retrieving missing data, and receiving information regarding the place and time of death, type of health providers and cause of death. However, even with this more detailed approach, there was limited information regarding the circumstances surrounding a maternal death, especially on causes of the “three delays”. There is also no source of information on actions taken by relevant agencies and authorities, such as township, district, state, division and central level of the Department of Health.

In 2005, a maternal and perinatal death audit was initiated in five townships of Sagaing Region. In 2009, this was changed to a maternal and neonatal death review and expanded to cover 30 essential newborn care (ENC) townships. This involved the development of maternal death review guidelines including reporting and review forms; training; and organizing the audit team.

The MDR method used is community-based verbal autopsy, which involves the interview of family members of the deceased and care providers. MDR forms were distributed to all midwives in December 2010 to start the process. Besides the information generated by these forms, a review was also carried out on the home-based maternity record (HBMR) if the deceased had received antenatal care (ANC) from a midwife. In the case of hospital deaths, an additional review is conducted of the patient records, postmortem examination report, and the findings and comments from the hospital doctors and other staff. From this process, the cause of the maternal death is decided as well as the factors that contributed to the death, especially the causes of any delay in seeking care, using the three-delay model.
3. Objectives and methodology

3.1 Objectives

The general objective was to contribute to improving the quality of maternal health services in Myanmar through evaluation of the MDR. The specific objectives were:

1) to describe and analyse the process of the MDR in Myanmar
2) to document and share Myanmar’s experience in implementation of the MDR
3) to suggest measures to improve and strengthen the MDR in Myanmar.

3.2 Methodology

This study was carried out in 10 of the 30 townships designated as Essential Newborn Care where the MDR by verbal autopsy was introduced in December 2010. These townships are:

<table>
<thead>
<tr>
<th>Region</th>
<th>Township</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayeyarwady</td>
<td>Hinthada</td>
</tr>
<tr>
<td></td>
<td>Myaungmya</td>
</tr>
<tr>
<td></td>
<td>Wakema</td>
</tr>
<tr>
<td></td>
<td>Yaykyi</td>
</tr>
<tr>
<td>Bago</td>
<td>Kawa</td>
</tr>
<tr>
<td></td>
<td>Thanutpin</td>
</tr>
<tr>
<td>Magwe</td>
<td>Salin</td>
</tr>
<tr>
<td>Mandalay</td>
<td>Yamethin</td>
</tr>
<tr>
<td>Sagaing</td>
<td>Monywa</td>
</tr>
<tr>
<td></td>
<td>Sarlingyi</td>
</tr>
</tbody>
</table>

The methodology was simple, using only two tools of data collection:

(i) A checklist (Annex 1) to collect information from health facilities in the townships, in which the researcher records observations made. In each township, five to six facilities were visited to complete this checklist. The 14 items in the checklist required only a “yes/no” response, with no detailed description. For example, it asked whether a team had been formed, whether members were selected according to guidelines (not who they were), and whether meetings were held (but not how many).

(ii) A questionnaire for an in-depth interview of individuals (Annex 2) was designed for a purely qualitative response. These interviews were conducted across a wide range of health staff; at township level these included the Township Medical Officer, obstetricians, Township Health Nurse, Station medical officers, health assistants who were focal persons of a Rural Health Centre (RHC), and midwives for village tract level. In each township, 10–12 individuals were interviewed.
Both the checklist and questionnaire were prepared with the advice of the Deputy Director General Public Health and Director Public Health. Before the data collection, the facilitator and the central team – MCH Deputy Director, Assistant Directors and Medical Officers – trained the data collectors for consistence and completeness of data collection. These data collectors were MCH and other medical doctors from central level. Data collected were forwarded to township, Station and RHC levels.

3.3 Other related studies

While this study was conducted as part of a five-country study led by WHO on the implementation of MDRs, two other initiatives in Myanmar supplemented this study. One was conducted by the same researcher to analyse the profile of maternal deaths in the eight-month period between January and August 2011, covering all 30 townships that were implementing an MDR. This was carried out in three tertiary hospitals, two in Yangon and one in Mandalay, in 2006. The second was a facility-based MDR at North Okkalapa General Hospital on two occasions between 2009 and 2011 by an obstetrician/gynaecologist who is professor and head of a university department. The findings of both studies are presented in the Section 4.

At a Regional Workshop on Strengthening Capacity for Facility-based Maternal Death Reviews held in September 2007, the representative from Myanmar presented the findings of an MPDR conducted in the first five months of 2007 in five townships in Sagine Division as combined facility- and community-based audits.

4. Findings

The findings of this largely qualitative study are presented below in terms of the responses derived directly from the checklists on health facilities and the in-depth interviews of the various stakeholders. The checklist gave an idea of the organization of the teams, while the interview uncovered findings under different aspects of the implementation of the verbal autopsy in the 10 townships. (In this report, the responses have been edited for grammatical accuracy and clarity.) Findings from the related studies highlighted in Section 3.3 are reported first.

4.1 Maternal death profiles from the related studies

In the review of maternal deaths in 30 townships in 2011, nearly half the maternal deaths happened in the intrapartum period, and one third in the postpartum period. Postpartum haemorrhage (PPH) was the leading cause of maternal deaths (38.4%) followed by severe pre-eclampsia and eclampsia (15.2%), sepsis (8.5%) and abortion (8.1%). Nearly 30% of maternal deaths occurred in women who were attended by unqualified, non-registered personnel. It was found that 73.5% of maternal deaths were associated with the first delay, 8.5% with the second, and 34.1% with the third delay. The facility-based maternal death audit conducted by the obstetrician in three tertiary hospitals (52 maternal deaths were audited) found that half were due to septic abortion, a quarter to haemorrhage and about one fifth to hypertensive disorders. The
second audit conducted at North Okkalapa General Hospital showed that sepsis due to induced abortion was the leading cause of death, followed by eclampsia and PPH.

The MPDR conducted in 2007 in five townships in Sagine Division showed that almost 70% of deaths occurred at home, 23% in hospital and 7% on the way from home to hospital. Eclampsia and PPH each contributed to 30% of deaths, and sepsis another 15%. There was evidence that all the three delays played a role, with the first delay (deciding to seek care) contributing to most of the deaths.

The findings in the following sections pertain to the current study on implementation of the MDR in 10 townships.

### 4.2 Organization

All 10 townships had established an MDR team according to the guidelines except Thanutpin Township. Four had actively organized a maternal and neonatal death audit team from the Station up to RHC level, led by the Station Medical Officer at the Station level and health assistants at the RHC level; sometimes the local authorities of respective areas were also included. Findings of the facilities assessed using the checklist (which required a yes/no response), are shown in Table 1.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Township (n=10)*</th>
<th>Station Hospital (n=12)*</th>
<th>RHC (n=20)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organized Maternal and Neonatal Audit Team</td>
<td>10 (100%)</td>
<td>7 (58.3%)</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>Organized Maternal and Neonatal Audit Team members according to the guidelines</td>
<td>8 (80%)</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Review meetings of maternal and neonatal audit deaths conducted every month</td>
<td>10 (100%)</td>
<td>8 (66.7%)</td>
<td>18 (90%)</td>
</tr>
<tr>
<td>Maternal and neonatal deaths diagnosed</td>
<td>9 (90%)</td>
<td>11 (91.6%)</td>
<td>19 (95%)</td>
</tr>
<tr>
<td>Types of delay of deaths determined</td>
<td>9 (90%)</td>
<td>11 (91.6%)</td>
<td>19 (95%)</td>
</tr>
<tr>
<td>Route of delay of deaths determined</td>
<td>9 (90%)</td>
<td>11 (91.6%)</td>
<td>19 (95%)</td>
</tr>
<tr>
<td>Records kept of death review</td>
<td>10 (100%)</td>
<td>12 (100%)</td>
<td>20 (100%)</td>
</tr>
<tr>
<td>Feedback delivered to lower levels</td>
<td>10 (100%)</td>
<td>12 (100%)</td>
<td>0%</td>
</tr>
<tr>
<td>Output of death review reported to upper levels</td>
<td>10 (100%)</td>
<td>12 (100%)</td>
<td>20 (100%)</td>
</tr>
<tr>
<td>Mapping of maternal and neonatal deaths conducted</td>
<td>6 (60%)</td>
<td>3 (25.0%)</td>
<td>0%</td>
</tr>
<tr>
<td>Use of the referral forms</td>
<td>3 (30%)</td>
<td>5 (41.6%)</td>
<td>2 (10%)</td>
</tr>
<tr>
<td>Actions for maternal and neonatal deaths</td>
<td>10 (100%)</td>
<td>12 (100%)</td>
<td>20 (100%)</td>
</tr>
</tbody>
</table>

* n=those that responded YES to the parameter in the checklist.
All facilities met completely three parameters – keeping records of the deaths, giving feedback to the upper level, and giving feedback to lower levels.

4.3 The reporting form

Teams in all townships except one had conducted at least one MDR. The exception was Sarlingyi Township in Sagaing Region where there was no maternal death reported; the team instead reviewed a neonatal death. All respondents said that the audit identified the cause of death, and causes of any delay using the three-delay model.

Regarding experiences in filling out the review forms, there were mixed responses. Half of the interviewees responded that the form had too many pages; several had no idea how to complete it and about a third expressed the need for a refresher course on how to fill them out.

“I have no idea how to fill it up and need training individually” said by midwives from Myaungmya Township.

However, the other half of the interviewees had no difficulty in filling out the review forms.

“Midwives have no idea how to fill it up and cannot complete it but were able to fill up the review forms through team approach, thus no difficulties in filling the forms and no need to conduct refresher training” responded Salin Township Medical Officer (TMO).

All respondents complained of insufficient forms and often needed to copy them.

“There are not enough forms and we need to copy the 30-page forms. The programme provides one copy for each midwife, and it costs her more than 10 000 kyats (US$ 10) for each maternal death for photocopying 5 sets of maternal death review forms…”

Interestingly, this problem with insufficient forms became a reason for midwives to try to have as few deaths as possible.

“….therefore we tried as much as we can for a maternal death not to happen in our area jurisdictions. But we want to continue this system as it allows us to provide heath education to the communities and also to the TBA” said midwives in Kawa Township.

It was remarkable that these midwives found the MDR important and that it should be continued. There were other responses that echo the positive opinions and attitude towards the MDR despite the problems faced with the form.

“This maternal death review form with 30 pages is very comprehensive, looks smart so due regard is paid by the communities especially TBA. Since it is very comprehensive to explore not only the cause of death but also the delay, the reasons and whose fault to cause maternal death, we can educate communities on the basis of these deaths to prevent other similar maternal death case.”
“This maternal death review form with 30 pages can review a death thoroughly. It can also explore the weakness of the providers so that they become aware of their weakness and can avoid the same mistake.” – basic health staff (BHS) from the Thanutpin Township.

4.4 Timing of the audit

Regarding timing of the review within the required seven days of the maternal death, all townships except Kawa Township responded that they faced difficulties to interview family members within this time, mainly due to their unwillingness to talk about the death during their grief and bereavement. In Kawa Township, the BHS said that the MDR within seven days was generally feasible, and it had the advantage of being more informative, especially if besides the families there were other witnesses and neighbours present.

……the family members were reluctant to respond to the questions; they tried to avoid answering as they were suffering grief and a time of tragedy.” – respondent from the BHS from Yaykyi Township.

“The review should be made some time after the funeral as at the time of reviewing, they feel sad and depressed so that their response will not be correct.” – BHS from Hinthada Township.

4.5 Strengths and benefits

One strong aspect of the MDR was the positive attitude of all the township supervisory teams who appreciated the benefit of the MDR and fully supported its activities. All of them wanted to continue the MDR in their respective places, and many suggested that it should be expanded to other townships. They appreciated the fact that the audit reveals not only the cause of the death, but also the factors that contributed to the death especially in terms of the three delays. They felt more able to prevent future deaths in women with the same problems by giving health education based on evidence.

“It can explore not only the cause of death and delay but also can find out the way to solve it, provide feedback and as the community comes to accept BHS’s advice, can draw a micro-plan, and can share BHS’s experience.” – BHS from Sarlingyi Township.

Another positive outcome of the MDR was heightened awareness among health staff. At the BHS level, the audit is said to have led to a higher level of awareness on the importance of maternal health, increased referral of risk cases and more institutional delivery.

“Midwives had better understanding of their responsibility, provided more quality ANC, gave health education with evidence, and they did more field visits. The MDR can also explore reasons for a midwife not using the review form.” – Myaungmya Township team.
“Midwives came to know of their abilities: they can give feedback to BHS, get useful information, provide more education to TBA, refer more cases, help pregnant mothers support each other. They also become more encouraged to conduct ANC, VCT [voluntary counselling and testing] … the quality of BHS has improved, they have more confidence, explore more of the delays and problems, and there is more cooperation with hospital and BHS.” – Wakema Township team.

“Before the review mechanism, midwives had the wrong perspective, they were not concerned with maternal deaths not delivered by them. Now, midwives also know that they are responsible for all maternal deaths in their jurisdiction.” – Health Assistant from Tarwa RHC of Thanutpin Township.

Not only the government health staff’s awareness was raised, this was also found among TBAs, including awareness on their constraints and limitations compared to the midwives.

“I have only hands, the midwives have full facilities and equipment.” – TBA from Kawa Township.

The community has also become more aware of the importance of maternal health. With this awareness, there was more response from the communities and local authorities. For example, the local authorities were more prepared to arrange for transport for referred cases in an emergency.

“There was a better relationship between the communities and BHS due to evidence-based health education.” – BHS from Hinthada Township.

This enhanced community awareness has also led to more active participation, including mobilization of local resources. In Sarlingyi Township, during an emergency, the community took the responsibility for calling a vehicle and the local authorities organized the collection of funds to help the mother get to a facility. The local authorities made arrangements for transportation and arranged free-of-charge services by the TMO for the poor in Yaykyi Township.

At one Station Health Unit, a social team had procured a vehicle for referral and provided 10 000 kyats for a patient. In Salin Township, a revolving fund for medical emergencies was organized by the social team, which has plans to buy an ambulance through donations. In Hinthada Township, 100 000 kyats in each RHC has already been saved for emergency preparedness. In Monywa Township, RHC generated funds for emergencies of 100 000 kyats per month including a donation from the Myanmar Maternal and Child Welfare Association (MMCWA) that is also used to carry out activities by the community support group. In Thanutpin Township, the TMO advocated for local authorities to refer emergency cases (although did not get the expected level of interest, mainly because staff of the local authorities were young and inexperienced). In Kawa Township, the local authorities did not participate in similar fundraising and savings schemes, but committed to help as much as they could in whatever way during an emergency.
4.6 Weaknesses and difficulties faced

Most respondents claimed that they faced difficulties in interviewing family members of maternal deaths and care providers of mothers. Families were either not able or not willing to answer correctly and precisely. TBAs may harbour fear of being sued.

“TBAs and family members, who were birth assistants of those maternal deaths, were very reluctant to answer so the response was not precise and correct. They tried to conceal their faults and to protect the negative exposure on TBA and also they thought that the officials will sue them.” – midwife from Kawa Township.

“A male TBA of 80 years old was hiding so we searched and wandered and tried to find him for some time with great effort to review maternal death. So it takes time and sometimes it is very hard to seek these men for us to conduct the review.” Township health nurse from Yamethin Township.

Obtaining information from the private sector, especially from unlicensed facilities, poses a particular difficulty.

“We sometimes face difficulties in death review especially at polyclinic (private sector) and illiterate families but it is convenient if local authorities have participated with helping hands.” – staff in Myaungmya Township.

In Wakema Township, they found no difficulties in hospital deaths reviewed by medical doctors but difficulties in review of maternal deaths in the community.

“It is wise to visit the families of a maternal death two times […]. First time is just for condolence and second time is thorough review for maternal death” answered one health assistant of Salin Township.

When enquiries needed to be repeated several times, the communities became suspicious and refused to answer.

In certain areas, poor awareness of the purpose of the MDR is a constraint. In Thanutpin Township, the communities thought that the MDR was done as a routine practice of BHS and did not know that it was done to prevent maternal deaths.

The costs for transportation and photocopying the MDR forms were the most frequently cited difficulty in carrying out the MDR. This problem is made worse by the need to make repeated visits for the enquiry, so much so that the BHS became frustrated and overworked, raising the possibility of under-reporting. Sometimes they found it difficult to do the review within seven days of death. Not knowing how to fill in the form is a common problem faced by midwives and this makes them refer the case to a township hospital.

In some townships, support from local authorities was weak; it was even reported that some authorities had expressed strong negative opinions.
“Let them die...unless they came to seek ANC and tetanus typhoid immunization, we cannot give help to persons who did not give priorities to their health.” – Yamethin Township.

4.7 Actions taken

All the study townships said that the actions they had taken and would take in future depended largely on the knowledge of cause of death and factors that led to delay in getting care. Most said that an important action was giving health education to the communities about the importance of seeking ANC and of being delivered by skilled health personnel, as well as to be aware of danger signs. The findings of the MDR have also encouraged the making of birth plans or birth preparedness.

The TMOs assured that they give feedback to all BHS following the audit, and that they encourage the timely referral of risk pregnancies.

Specific action plans differ among the townships. In Monywa Township for instance, “quality ANC days” with the collaboration of the MMCWA are in place. In Myaungmya Township trained AMW and TBA strengthened their partnership with BHS and created linkages with nongovernmental organizations and civil societies. In Wakema Township, the team drew up micro-plans on how best to use the MDR. SBAs began to strengthen the quality aspect of ante- and post-natal care, and organized a health talk by health assistants once a month at RHC level and once every three months at township level. In Yamethin Township, the team negotiated with the police training institute to promote safe blood donation.

If the care provider for the maternal death was non-skilled such as a TBA, the TMOs meet with them to discuss how to prevent the same thing from happening in future, which may include the temporary suspension of providing such care. They also negotiate with local authorities for referral and give evidence-based health education to communities, seek ANC, make a birth plan for every pregnant woman and establish funds for medical emergencies.

4.8 Suggestions

The township review team from Yaykyi, Hinthada and Yamethin suggested that the MDR should be conducted after seven days of maternal death. Some respondents suggested that the review forms be made shorter than the current 30 pages, and the members of the team should be provided with enough forms. Transportation costs for MDRs should be supported. Advocacy on the importance of MDR should be carried out within the community, especially to ameliorate the problem of reluctance to respond to the review and hiding information, and for families and care providers who often provide incorrect, incomplete or no answers during the review.

The TMO of the Kawa Township highlighted the need for postmortem examination:

“There is a need to do postmortem examination to get the correct diagnosis of these maternal deaths. Since the maternal death review method is only verbal autopsy by
interviewing families and care providers, reliance is purely on their answers. Therefore, if the postmortem can be done, the correct diagnosis will be made.”

The TMO of Salin suggested incentives, but interestingly this was suggested in terms of equipment and not financial incentives to the investigator or review team:

“There should be provided incentives like blood pressure cuff, stethoscope, weighing machine to BHS who made timely referral.”

5. Discussion

It is notable that there is only one national initiative for the MDR in Myanmar, i.e. the community-based verbal autopsy that began in December 2010 in townships identified for ENC. This study sampled 10 of these townships.

The methodology used included a checklist of the facility and a questionnaire for an in-depth interview, which gave most of the findings as verbatim responses. This good range of responses covered various aspects of implementation of the MDR, including its organization, the processes involved in the audit, the strengths and weaknesses and the actions taken to respond to the findings. Needless to say, many of these expressed opinions, feelings and to some extent frustration among the members of the MDR team especially those who were involved in the care of the deceased women. These have been encountered in almost all MDR initiatives in other countries.

The positive attitude and appreciation of the MDR by the township supervisory teams, who unanimously wanted the MDR to continue, is the most significant strength of this initiative; indeed, many of them suggested that it should be expanded to other townships. This is significant because this acceptance will lead to commitment among supervisors that will determine the sustainability of the initiative. Their appreciation that the MDR is able to identify not only the medical cause of maternal death but also the factors that contributed to it (especially in terms of the three delays) shows how keen they are to prevent maternal deaths. This level of interest will likely result in more efforts in the future such as carrying out health education based on evidence found in the audit, a feeling that was expressed by a large number of respondents.

The heightened awareness among health staff and the community is another successful aim of the MDR. It is therefore apt that the staff felt that the audit would lead to an increased referral rate of risk cases and to more institutional delivery. This has been seen in countries that have implemented MDRs such as Malaysia and South Africa (both followed the United Kingdom model of CEMD in hospitals and in the community).

The weaknesses and difficulties found in this study were also not very different from those found in other countries that conduct MDRs, especially the problems of a lengthy reporting form in short supply. It is possible that the length (30 pages) of the form has to do with the intention of getting information that is as comprehensive as possible. While this is a valid intention and has its merits, it is ineffective if the staff
using it do not feel comfortable or motivated to use it. The problem of short supply is a simple logistics and management problem, and should be solved with relative ease. Clearly the health staff conducting the MDR should not be overburdened, not only in terms of workload but also of cost. In fact, health staff in similar studies suggested some form of incentive to conduct the audit. It is interesting that in this study, the incentives suggested were not in terms of payment, but in terms of better supplies and other forms of support. While this does not directly influence the MDR, it is a form of incentive to the health staff and audit team members.

Transportation was another cost highlighted. It has to be accepted that any form of MDR, however simple or small, is not free of cost. Indeed, countries that have adopted the CEMD based on the United Kingdom model have earmarked a budget for the activity. These costs are not only for the investigator who collects the data and information, but also to convene the review team meetings.

The difficulty faced in trying to do the review within seven days of death is based on a very valid reason that the family in grief is not likely to offer information. This sensitivity will appear in all cultures in the world, since the responses to illness and death are very culturally centred.

Unwillingness to respond to the audit is not only due to the seven-day period and the grief of the family. Overall there appears to be a low level of awareness on the importance and intention of the MDR: some people think it is routine work of the health department that does not really concern them; others fear negative actions against them, and TBAs fear being sued. This situation is likely to exist in other countries, especially developing countries where literacy and health awareness are low. Therefore, the fact that awareness of health providers and the community had been enhanced by the MDR in some cases is a significant finding.

This study suggests the important role and influence of the TMO. In Thanutpin Township, the TMO advocated to local authorities for the referral of emergency cases and this proactive effort is commendable. Some TMOs have met with unskilled midwives to discuss how to prevent negative outcomes.

The difficulty of obtaining information from the private sector, especially unlicensed facilities, is another universal problem. In some countries, the private sector is represented in the audit team as in the CEMD in Kerala, India. In others, a representative of a professional organization (e.g. the Obstetrics and Gynaecology Society) is on the review team or committee, who is often from the private sector. However, this study found that obtaining information from the private sector was not necessarily a problem in Myanmar, as witnessed in the Wakema Township.

As highlighted earlier, the community-based verbal autopsy in the 10 townships is the only MDR initiative in Myanmar that is nationally driven. It is possible that individual maternal death audits are carried out as clinical case audits in hospitals, since this is a quality assurance activity encouraged by clinicians. It should also be noted that the MDR in Myanmar has only existed since December 2010. Nonetheless, this study revealed a range of findings that describe the experience quite substantially.
It is possible – indeed likely – that this first well-organized effort for MDR is only a starting point for Myanmar, and will lead to more comprehensive initiatives in future. It is also likely that Myanmar embarks on perinatal and newborn death audits. If necessary (when the number of maternal deaths becomes too small to allow for a good range of experiences to learn from), Myanmar may wish to extend the MDR to include cases of severe maternal morbidity or near-miss cases. In fact, in this study one township had no maternal deaths and the team instead reviewed a neonatal death. In similar circumstances, the team could have identified a maternal near miss for audit.

The other study that covered all 30 townships supplemented the findings of this study in terms of implementation including its strengths and weaknesses, besides providing the profile of maternal deaths. It is encouraging that there have been independent small-scale studies to complement the national MDR initiative. For example, the initiative by the obstetrician to conduct clinical audits in the hospital has provided valuable information on the profile of maternal deaths. Similarly the MPDRs conducted in five townships in 2007 gave useful information on causes of deaths and contributing factors especially the role of the three delays.

6. Recommendations

The recommendations made are as follows.

- Maternal death review forms – these need to be reviewed and revised to be less lengthy and cumbersome than the current 30-page form, but at the same time ensuring the adequate and complete capture of information. It is recommended that the revision be conducted with as many stakeholders as possible, especially midwives who play a crucial role in the verbal autopsy. There is also a need to ensure that sufficient numbers of the forms are supplied.

- Training and skill-building – since several midwives expressed lack of skills and confidence in filling out the audit form, refresher courses for them are warranted.

- The health facilities should be properly equipped; even if this does not directly contribute to the MDR, it is a form of incentive to the audit team.

- The requirement for conducting the verbal autopsy within seven days of the death needs to be reviewed. It is suggested that a consultation with representatives of the community be convened prior to the revision of this policy.

- The issue of transport costs need to be addressed and managed, and the most appropriate body for this is the Township Health Supervisory Committee.

- Constant monitoring of the MDR needs to be ensured and, if necessary, a proper system put in place; this is especially important for the MDR initiative in Myanmar as it is relatively new. Evaluation of MDR activities should be conducted at reasonable intervals. The MDR should be incorporated into an annual evaluation at every level.

- The MDR should be scaled up to other townships based on the experiences and findings of this study.
• Advocacy and health education to the community need to be carried out and further strengthened.
• The positive and commendable actions and responses made by the community needs to be encouraged, and acknowledged appropriately.

7. Conclusions

A maternal death review can explore the causes and three delays that may result in a maternal death, and point to follow-up actions. By conducting the assessment of MDR experiences in Myanmar, the strengths and weaknesses of the system and procedures were explored. By documenting these, changes can be made for improvement.
### Annex 1.

**Checklist for health facilities**

<table>
<thead>
<tr>
<th>No.</th>
<th>Particulars</th>
<th>Response</th>
<th>Code No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Organization of Maternal and Neonatal Audit Team</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>If yes, the date of organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Organization of Maternal and Neonatal Audit Team members according to the guidelines</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Conduct review meeting of maternal and neonatal audit deaths every month</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Find out the diagnosis of maternal and neonatal deaths</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Find out the type (*) of delay of deaths</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Find out the cause (***) of delay of deaths</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Keep the records of death review</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Deliver feedback of the output of death review to the lower level</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Report of the output of death review to the upper level</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Keep mapping of maternal and neonatal deaths</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Use of the referral forms</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Receive the referral forms</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Actions for maternal and neonatal deaths If yes, __________________________</td>
<td>(1)Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*) “type” of delay means ……………………………………………

(**) “Cause” of delay means ……………………………………………
Annex 2.

Data collection for maternal death review experiences (in-depth interview guidelines)

1. Has a Maternal Audit Team been organized in this Township? If yes, when was it established and who are the members?

2. Since it has been established, how many mothers have died? What have been the causes of death?

3. Was there a Maternal Death Review for these deaths?

4. If yes, how was it conducted? Could you determine the diagnosis, delays and routes of delay?

5. Were there any difficulties in filling up the maternal death forms?

6. Were there any difficulties in the Maternal Death Review?

7. What were the activities for the Maternal Deaths Review?

8. What are the future plans for prevention of such maternal deaths?

9. What did you plan for patient referral?

10. What is the emergency preparedness for pregnant mothers from the communities?

11. How did you discuss with the birth attendants who assisted in these cases? If they were not BHS like AMWs and TBAs, how did you instruct them?

12. What are the strengths of the Maternal Death Review?

13. What are the weaknesses and challenges of the Maternal Death Review?

14. How does Maternal Death Review help to reduce maternal deaths in this area?

15. How would you describe this Maternal Death Review?
A study on the implementation of maternal death review in Myanmar
Message from the Regional Director

The maternal mortality ratio (MMR) is a critical indicator used to track progress towards the Millennium Development Goal 5 (MDG 5) to reduce maternal mortality. A reduction in maternal mortality is essential for improving the health and well-being of women and children. In the South-East Asia Region, the maternal mortality ratio (MMR) has decreased from 200 in 2000 to 110 in 2015, which is a significant achievement. The maternal mortality ratio in the region is now below 130, which is a remarkable improvement from the situation in 2000. However, there is still much work to be done to reduce maternal mortality further.

The WHO recommends that countries should prioritize efforts to reduce maternal mortality by increasing access to skilled attendance during delivery. This includes improving access to emergency obstetric care and providing training to health workers to improve their skills in managing complications during delivery. In addition, efforts should be made to increase the use of antenatal care and to provide access to family planning services.

The report of the Commission on Information and Accountability of the United Nations Commission on Children and Women's Health recommended specific policies and interventions to reduce maternal mortality. These include increasing access to skilled birth attendance, improving referral systems to ensure timely access to emergency obstetric care, and addressing the social and economic factors that contribute to maternal mortality.

Countries should also prioritize efforts to reduce maternal mortality by strengthening health systems and increasing investments in maternal health. This includes ensuring that health workers have access to the necessary tools and resources to provide quality care, and that facilities have the capacity to handle maternal emergencies.

The Regional Office for South-East Asia has been working with member countries to improve maternal health outcomes and reduce maternal mortality. The Regional Office has provided technical assistance, training, and financial support to help countries implement effective strategies to reduce maternal mortality. In addition, the Regional Office has been monitoring progress and providing regular updates on maternal health outcomes.

In conclusion, reducing maternal mortality is a critical goal for achieving the MDGs and improving the health and well-being of women and children in the South-East Asia Region. Countries must continue to prioritize efforts to reduce maternal mortality and work towards achieving the goal of zero maternal deaths by 2030.