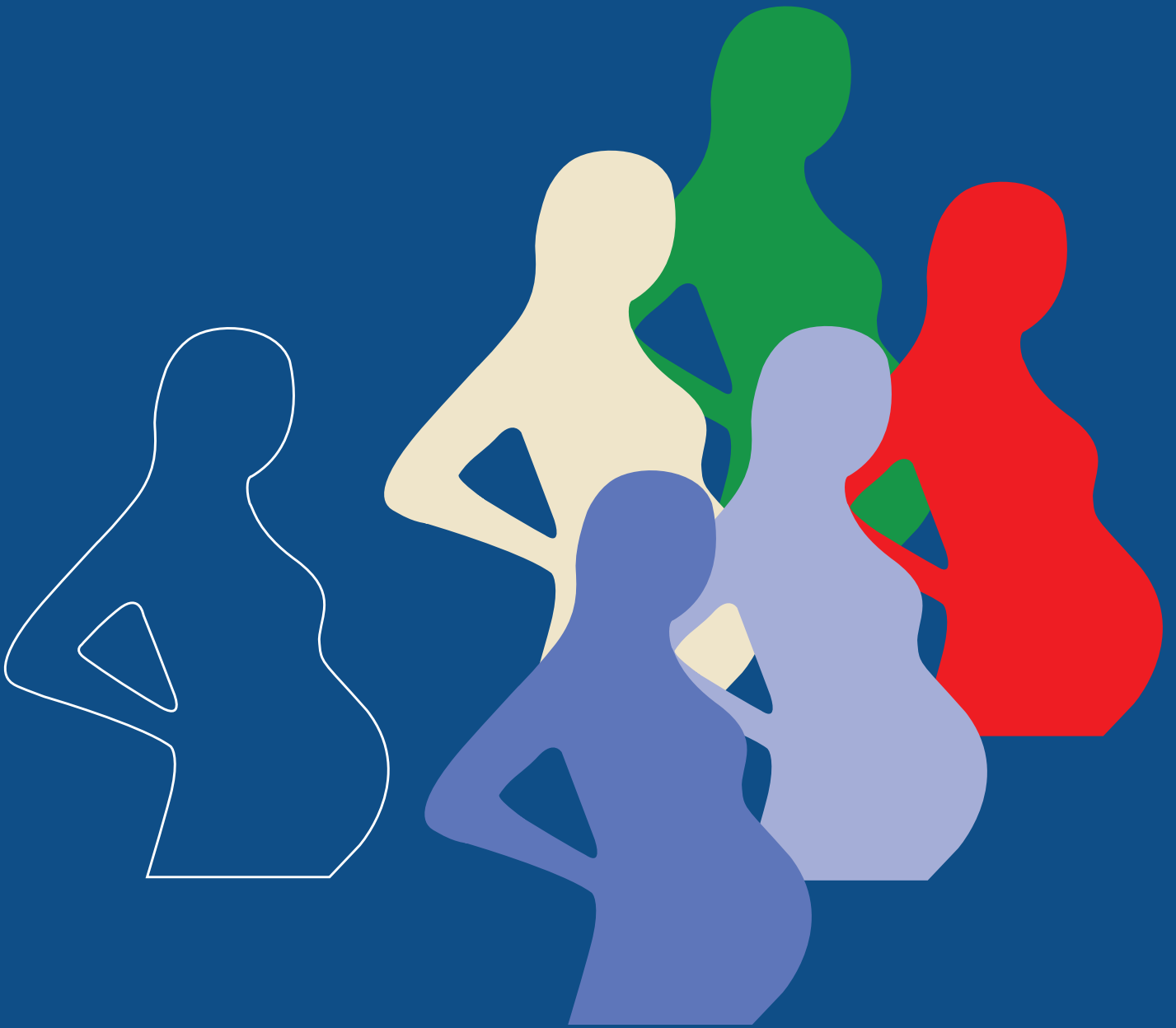


Time to respond

A report on the global implementation of
Maternal Death Surveillance and Response



World Health
Organization

Time to respond

A report on the global
implementation of
Maternal Death
Surveillance and
Response



**World Health
Organization**

WHO Library Cataloguing-in-Publication Data

Time to respond: a report on the global implementation of maternal death surveillance and response.

1. Maternal Mortality – prevention and control. 2. Cause of Death. 3. Population Surveillance.
4. Health Surveys. 5. Case Reports. 6. Program Evaluation. I. World Health Organization.

ISBN 978 92 4 151123 0

(NLM classification: WQ 270)

© World Health Organization 2016

All rights reserved. Publications of the World Health Organization are available on the WHO website (<http://www.who.int>) or can be purchased from WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel.: +41 22 791 3264; fax: +41 22 791 4857; email: bookorders@who.int).

Requests for permission to reproduce or translate WHO publications – whether for sale or for non-commercial distribution – should be addressed to WHO Press through the WHO website (http://www.who.int/about/licensing/copyright_form/index.html).

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 and dashed 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.

Printed in Switzerland.

Contents

Abbreviations	v
Acknowledgements	vi
Foreword	vii
Maternal death surveillance and response (MDSR) at a glance	viii
Executive summary	1
Introduction	4
Ending preventable maternal mortality: the origins of maternal death surveillance and response	6
How many mothers are dying? Why do they die and what is being done to prevent it?	8
Listen, learn, act: the role of maternal death surveillance and response	11
Wider benefits of MDSR	17
Monitoring implementation of MDSR	19
Current global status and implementation	21
Country case studies: MDSR in action	27
Barriers to progress: current implementation difficulties in countries	31
Global support for MDSR implementation	36
Recommendations	38
Conclusion and next steps	41
References	42
Annex. The MDSR baseline survey questionnaire	47

Abbreviations and acronyms

Accredited social health activist (ASHA)
Acquired immune deficiency syndrome (AIDS)
Centers for Disease Control and Prevention (CDC)
Centre for Maternal and Newborn Health (CMNH)
Civil registration and vital statistics (CRVS)
Civil society organization (CSO)
Commission on Information and Accountability (CoIA)
Confidential enquiry into maternal deaths (CEMD)
Dead Women Talking (DWT)
Department for International Development (DfID)
Ending Preventable Maternal Mortality (EPMM)
Every Newborn Action Plan (ENAP)
Evidence for Action (E4A)
Health management information system (HMIS)
Human immunodeficiency virus (HIV)
Integrated disease surveillance and response (IDSR)
International Confederation of Midwives (ICM)
International Federation of Gynaecology and Obstetrics (FIGO)
Liverpool School of Tropical Medicine (LSTM)
Low- and middle-income countries (LMICs)
Maternal death review (MDR)
Maternal death reporting and review (MDRR)
Maternal death surveillance and response (MDSR)
Maternal mortality ratio (MMR)
Maternal, newborn, child and adolescent health (MNCAH)
Millennium Development Goals (MDGs)
Ministry of Health (MoH)
Partnership for Maternal, Newborn & Child Health (PMNCH)
Saving Mothers, Giving Life (SMGL)
Sustainable Development Goals (SDGs)
United Nations (UN)
United Nations Population Fund (UNFPA)
World Health Organization (WHO)

Acknowledgements

Members of the MDSR Working Group provided impetus and technical input for this report and for the 2015 MDSR baseline survey on which its findings and recommendations are based. The World Health Organization headquarters set up and implemented the global survey on MDSR implementation in collaboration with Staff at the United Nations Population Fund (UNFPA) headquarters. Regional and country focal points for both UNFPA and the World Health Organization supported the process. Thanks are due to all the countries that responded to the survey questionnaire and provided additional input in the form of case studies. Rebecca Wallace and her team at Robert Gordon University, Aberdeen, provided valuable input to the MDSR baseline survey by conducting a complementary study into the characteristics of MDSR and obstacles to its success. Additional thanks to Amnesty International and the Dead Women Talking Initiative for letting us quote the true stories of women who died giving life. Time to Respond was produced by Nathalie Roos, Matthews Mathai and Dilip Thandassery Ramachandran of the World Health Organization, with writing and editing support from Richard Cheeseman of Robert Taylor Communications.

Foreword

Trying to understand why a mother died during pregnancy or childbirth, or even weeks later, can be incredibly frustrating. The medical causes may be known, but the full explanation for death from a treatable condition such as eclampsia remains unclear. Care may have been available in the woman's community or in a nearby health facility, but still she died.

This report on maternal death surveillance and response (MDSR) quotes harrowing examples of death from preventable maternal causes such as the story of Assetou, who died while being taken to hospital on the back of a motorcycle. Or of Dhani, who died before her family could call an ambulance to their isolated village at night. The physical suffering of these women and the panic and misery felt by them and their families are almost impossible to imagine.

We know of these cases because they were investigated and written up by experts from the Dead Women Talking initiative, trained to consider all contributing factors. But hundreds of other preventable maternal deaths occur every day about which we know little or nothing.

Many go completely unrecorded in countries that have weak systems for notifying vital events, or are misclassified under causes unrelated to motherhood. Maternal death reviews all too often focus solely on medical causes to the exclusion of other factors that may have contributed to a woman's death, such as lack of transport or money to pay for care.

These errors and omissions have resulted in a huge gap in our understanding of the magnitude and causes of global maternal mortality. Official reports underestimate the true magnitude by up to 30% worldwide and by 70% in some countries. This matters, because it is only by gathering and analysing large volumes of quality data that we can identify trends in maternal mortality – including the causes of deaths and where they occur – and use the knowledge to target health programmes and interventions that save women's lives.

That is why comprehensive and effective country MDSR systems are vital. They generate data by ensuring that all deaths of women of reproductive age are notified, and that all probable maternal deaths are reviewed by experts. They promote methods that investigate all factors contributing to a mother's death, such as verbal and social autopsy. And, crucially, they firmly couple surveillance and review to response – the process of generating evidence-based recommendations and using them to prevent similar maternal deaths.

Despite the commendable spread of MDSR globally in recent years, it is the final element – response – that lags furthest behind in terms of implementation and effectiveness, and which requires a major push as countries continue to roll out and expand their MDSR systems. In the struggle to eliminate preventable maternal mortality, it is time to respond.



Assistant Director-General, Women's and Children's Health
World Health Organization

Maternal death surveillance and response (MDSR) at a glance

RESPOND AND MONITOR RESPONSE

Key actors:



- National MDR committee
- District MDR committee
- Facility MDR committee

Key outputs (national):

- Revises the national maternal health plan in the light of findings
- Reviews policies, legislation and guidelines
- Allocates resources to specific interventions or target populations
- Monitors subnational implementation of recommendations

Key outputs (district):



- Produces a district report and discusses it with key stakeholders
- Puts in place a strategy to strengthen health-worker capacity
- Organizes large-scale staff training
- Raises awareness of key issues in the community
- Builds an action plan with key community stakeholders
- Monitors implementation of recommendations

Key outputs (facility):

- Implements national, district and facility recommendations through various means, including:
 - Training and guidelines
 - Reallocation of roles
 - New staff rotas
 - Reorganization of teams
 - Provision of new supplies (e.g. for hand washing)
 - Community engagement to address access issues



ANALYSE AND MAKE RECOMMENDATIONS

Key actors:



- National MDR committee
- District MDR committee
- Facility MDR committee

Key outputs (district):



- Reviews facility and community deaths (monthly or quarterly)
- De-identifies, manages and conducts data analysis
- Recommends preventive actions at facility and district level
- Formulates, implements and evaluates responses
- Sends summary of data to national level for national reporting and aggregated analysis
- Produces an annual report detailing district maternal mortality causes and recommending actions and responses
- Produces an action plan

Key outputs (national):



- Analyses aggregated subnational data
- Identifies maternal mortality levels and trends
- Identifies geographical maternal mortality patterns
- Reviews district recommendations
- Publishes national data and recommendations
- Publishes an annual MDSR report



Maternal death surveillance and response

A continuous action cycle

Monitoring & evaluation

IDENTIFY AND NOTIFY DEATHS

(in health facilities and in the community)

Key actors:

- Health facilities
- Health professionals
- Families and friends of the deceased
- Community health workers
- Community groups
- Community leaders and local authorities
- Civil society organizations and nongovernmental organizations (NGOs)

Key outputs:

- Identifies suspected maternal deaths
- Determines if a probable maternal death has occurred
- Collects data for review (including through patient record review in facilities and verbal/social autopsy in the community)

REVIEW MATERNAL DEATHS

Key actors:

- Facility maternal death review (MDR) committees
- District MDR committees
- Families and friends of the deceased
- Health professionals and others who provided care for the deceased
- Administrative staff
- Programme officers at all levels

Key outputs:

- Establishes medical cause of death
- Confirms the maternal death
- Determines any non-medical factors contributing to the death
- Assesses quality of care received
- Determines if death was avoidable
- Makes any immediate recommendations for corrective action
- Compiles investigation findings and sends them to district level with recommendations for action



WHO/SEARO/L PASSERINI

Executive summary

“ MDSR holds the promise of serving as an efficient intervention to save women’s lives. Data on the causes of women’s deaths is the black box of maternal mortality. Only with that box in their hands can countries respond effectively to eliminate preventable maternal deaths. ”

SIDA WEBSITE (1)

Maternal death surveillance and response (MDSR) is a continuous cycle of notification, review, analysis and response. It works to increase the avoidability of preventable maternal mortality by involving all stakeholders in the process of identifying maternal deaths, understanding why they happened and taking action to prevent similar deaths occurring in the future. The concept emerged in the era of the Millennium Development Goals (MDGs) and has become widely established globally, especially since the publication of detailed technical guidance in 2013.

Countries can adapt their existing arrangements for maternal death review (MDR) to sit within the framework of MDSR. It complements the system of integrated disease surveillance and response (IDSR), national systems for civil registration and vital statistics (CRVS) and health management information systems (HMIS). However, it is equally suited to countries that lack some or all of these arrangements, or have only partially implemented them, because it can be used as a template for creating a comprehensive system that notifies all suspected maternal deaths, reviews them and analyses the findings and implements and monitors recommendations for change. Such a system will generate reliable data on the rate and causes of maternal mortality – and so act as a cornerstone for a national CRVS system.

The key administrative elements of a national MDSR system are:

- A national policy to notify all maternal deaths
- A national policy to review all maternal deaths
- A national maternal death review committee that meets at least biannually
- Subnational maternal death review committees at the district and facility levels.

Key principles guide the operation of the system:

- Notification and investigation of all suspected maternal deaths in women of reproductive age (15–49 years)
- Notification within 24 hours of maternal deaths in health facilities (or within 48 hours when a woman dies in the community)
- Zero reporting when no suspected maternal deaths have occurred
- Timely review of all probable maternal deaths



- Immediate recommendations, where possible, to help health facilities and communities to prevent similar deaths, ensuring that key messages and information reach people who can make a difference
- Timely review and analysis at district and national levels to identify trends and patterns
- Timely publication of findings and recommendations at national level
- Continuous monitoring of the MDSR system and of how recommendations are implemented.

The 2015 MDSR baseline survey

To gather baseline information about the extent of MDSR implementation in low- and middle-income countries (LMICs), the World Health Organization (WHO) and the United Nations Population Fund (UNFPA) instigated a global survey of national MDSR systems in 2015. A questionnaire (**Annex 1**) was circulated to all WHO Member States. Responses were received from 67, of which 64 were LMICs. Member States were also invited to share information about successful implementation of MDSR in the form of case studies that described how barriers were overcome and highlighted innovative approaches. Supplementary information was taken from the WHO-MNCAH policy indicator database.

Implementation insights

The findings below relate to the implementation of MDSR by LMICs, based on the survey findings and the WHO-MNCAH policy indicator database:

- 86% had a national policy to notify all maternal deaths
- 85% had a national policy to review all maternal deaths
- 76% had a national maternal death review committee in place
- 65% had subnational maternal death review committees in place
- 60% had both national and subnational maternal death review committees
- 46% had national maternal death review committees that met at least biannually.

The disparity between the percentage of countries with a national policy to review all maternal deaths (85%) and those with a national maternal death review committee that met at least biannually (46%) suggests a gap between policy and practice in some countries.

Case study insights

Eighteen countries contributed at least one case study. In addition to much positive information about their experiences of MDSR, they highlighted challenges and barriers to implementation, including:

- Lack of political buy-in and long-term vision
- Under reporting of suspected maternal deaths due to inefficient and incomplete systems of notification
- A blame culture in some places that inhibits health professionals and others from participating fully in the MDSR process
- Incomplete or inadequate legal frameworks
- Inadequate staff numbers, resources and budget
- Cultural norms and practices that inhibit the operation of MDSR
- Problems of geography and infrastructure that inhibit the operation of MDSR.

Practical benefits of MDSR

Bangladesh

Social autopsy results highlight barriers that prevent mothers from seeking essential care and identify areas for improvement within health facilities and communities.

Burkina Faso

Introduction of MDSR and real-time reporting strengthens the existing system of integrated disease surveillance and response (IDSR).

Ghana

Community health workers use smartphones and electronic systems for recording and transmission to collect and analyse data from verbal autopsies more effectively.

India

Growing awareness of the significance of social determinants in maternal deaths informs improvements to both quality of care and supporting services and infrastructure.

Malaysia

A national system of confidential enquiry into maternal deaths has been instrumental in identifying the changes needed to reduce the maternal mortality ratio.

Nigeria

In Jigawa State, the application of national guidelines and tools for maternal death review has led to improvements in quality of care and the availability of essential drugs.

Philippines

The introduction of MDSR has brought some immediate policy changes, such as local ordinances that discourage home births assisted by traditional birth attendants.

Sierra Leone

New national technical guidelines, issued in August 2015, aim to strengthen the surveillance and response elements of MDSR.

Tanzania

An assessment of existing arrangements for maternal death review, in light of the 2013 MDSR technical guidance, has led to new implementation guidelines and tools.

Uganda

Work to establish MDSR highlights the benefits of identifying all deaths of women of reproductive age and of generating real-time data on maternal deaths.

These country examples are summarized from the MDSR baseline survey case studies, which are available at: <http://bit.ly/24416cn>

Conclusions and next steps

The survey and case study findings suggest that the immediate challenge in global MDSR advocacy and implementation is to support countries in their efforts to follow through on their policy commitments and “complete the loop” in the surveillance-response cycle. In particular, this requires a focus on improving levels of maternal death notification and on building and strengthening mechanisms for response at all levels.

To assist countries in their implementation efforts, the MDSR Working Group will continue to provide support. It will work with partners to develop a flexible MDSR training package that can be adapted to country priorities. The next MDSR global survey is scheduled to take place in 2017.

Introduction

Understanding exactly why a woman died in pregnancy or around the time of childbirth is a crucial first step towards preventing other women dying in the same way. As well as identifying the medical causes of death, it is important to know the woman's personal story and the precise circumstances of her death. Where was she when she died? Did she and her family realize she needed emergency care? Was care available to her and was it of good quality? Were there obstacles to her accessing care?

In 2004, a World Health Organization (WHO) publication, *Beyond the Numbers*, highlighted the importance of answering such questions and of taking action on the results (2). It set out the essential information required – including how many mothers are dying, where, when and why – to inform the design of targeted policies and programmes that work towards the elimination of preventable maternal deaths.

Maternal death surveillance and response (MDSR) is a relatively new approach to investigating maternal deaths and taking action based on the findings, which has evolved from the established system of maternal death review (MDR). It builds on MDR by stressing the importance of follow-up action (response) and of continual monitoring to ensure that recommendations are acted on. As a result, MDSR has been described as a "continuous action cycle for monitoring of maternal deaths" (3). The approach is new but the elements of MDSR have developed over several decades.



WHO/CHRISTOPHER BLACK

There has been a sharp increase in the number of countries adopting national policies to review maternal mortality since the publication of the first report of the Commission on Information and Accountability (CoIA) for Women’s and Children’s Health in 2011, which called for “better information for better results” (4). The MDSR Working Group published technical guidance in 2013 and numerous countries have begun to create MDSR systems by adopting policies for the essential components (5).

Detailed information about the extent and quality of implementation in each country has been largely unavailable due to the recent origins of MDSR and the lack of systematic data collection. The WHO-MNCAH policy indicator database provides some useful information but is of limited relevance to MDSR because it addresses the whole spectrum of maternal, newborn, child and adolescent health (6).

In response, WHO in collaboration with the United Nations Population Fund (UNFPA) instigated a global survey of national MDSR systems in 2015 to provide baseline data on the status of implementation. This report details the findings of the survey, with additional information from the WHO-MNCAH policy indicator database. It also tells the story of MDSR and its role in efforts to eliminate preventable maternal mortality by 2030.

Ending preventable maternal mortality: the origins of maternal death surveillance and response

The world has been counting maternal deaths for decades and continually coming up with an unacceptably high number. The most recent global estimate of 303 000 in 2015 represents a 43% decrease since 1990, but is still far short of the target set by Millennium Development Goal 5 (reduce maternal deaths by three-quarters between 1990 and 2015). Far too many women – about 830 every day – are still dying from causes that are well understood and largely preventable (7).

The 1990 baseline is an appropriate place to start any review of progress against maternal mortality, because a number of important events around that time prompted positive change. In February 1987, WHO, UNFPA and the World Bank hosted the Safe Motherhood Conference in Nairobi, which saw the official launch of the global campaign to reduce maternal mortality (8). The campaign had its origins in 1985 when Allan Rosenfield and Deborah Maine highlighted in the *Lancet* that, while many health programmes targeted newborns and children, maternal health was a neglected topic (9). Their article quoted a WHO estimate from 1979 that 500 000 women died every year in developing countries from “complications of pregnancy, abortion attempts, and childbirth”. It may have taken the international community more than six years to launch a coordinated response to this shocking number, but then the safe motherhood initiative rapidly gained traction.

In the decade after the Safe Motherhood Conference, the concepts of safe motherhood and a woman’s right to sexual and reproductive health became firmly established, with the help of the International Conference on Population and Development in 1994 and the Safe Motherhood Conference +10 in 1997. Global efforts to reduce preventable maternal mortality gathered momentum in the early years of the new century through the Millennium Development Goals (MDGs), in parallel with efforts to save newborns and children. Influential publications such as *Beyond the Numbers*, *The World Health Report 2005* (10) and the *Lancet* series on maternal survival (11) built the evidence base for maternal death reviews and promoted targeted care for women during pregnancy and around childbirth. The Partnership for Maternal, Newborn & Child Health (PMNCH) was established in 2005, bringing together hundreds of partner organizations working on maternal, newborn and child health to maximize the impact of research and advocacy.

Despite these efforts, progress towards MDGs 4 (child health) and 5 (maternal health) was still far too slow. United Nations Secretary-General Ban Ki-moon responded in 2010 by launching the Global Strategy for Women’s and Children’s Health (12) and creating the Every Woman Every Child movement to mobilize action by governments, donors, nongovernmental organizations and other actors. This resulted in a surge of new commitments to women’s and children’s health from an estimated US\$40 billion in September 2010 to US\$59.8 billion in May 2014 (13).

The Global Strategy called for a new focus on information and accountability, which led to the creation of the Commission on Information and Accountability for Women’s and Children’s Health (CoIA) in December 2010. CoIA established a set of core indicators

for the tracking of resources and commitments to women's and children's health and proposed improvements to health information systems and access to data. The 10 CoIA recommendations included one for improving systems for registration of births, deaths and causes of death and establishing well-functioning health information systems (14). This formed the outline for a new system of maternal death surveillance and response.

In September 2011, senior public health professionals and academics from various countries met in Atlanta in the United States of America to discuss ways of improving the measurement of, and response to, maternal mortality and its causes in the light of CoIA. The meeting, hosted by the Centers for Disease Control and Prevention and WHO, generated a wide range of recommendations, including steps to develop practical guidance for countries on how to establish or strengthen their arrangements for what was now being referred to as MDSR (15). As a result, technical guidance was developed and published in 2013 by the MDSR Working Group, comprising WHO, United Nations agencies, academics and professional organizations (16). The technical guidance describes the essential features and functions of a system that measures and tracks all maternal deaths in real time, takes account of all factors contributing to the deaths, and stimulates and guides actions to prevent future deaths. In this way, while retaining maternal death reviews as an integral part of the strategy, MDSR represents a more holistic approach to maternal mortality, its causes and prevention.

Countries have adopted MDSR rapidly since 2011, responding to the momentum for accountability created by CoIA and to the clarity and relevance of the technical guidance. **Figures 3 and 4** in this report demonstrate how the adoption of key elements of MDSR has accelerated since 2010 in low- and middle-income countries. This progress over a relatively short period was one of the factors that prompted the MDSR baseline survey. MDSR had entered a new phase of development, which needed to be recorded for future reference.

MDSR is part of a new wave of thinking about maternal health, which has coincided with the conclusion of the MDGs in 2015 and the launch of the Sustainable Development Goals (SDGs) and the updated Global Strategy for Women's, Children's and Adolescents' Health. Both the SDGs and the Global Strategy call for an integrated approach to health and sustainable development. MDSR advances that agenda by integrating the elements of maternal death monitoring and analysis, and improving quality of care for mothers and their babies through health-systems strengthening. It also injects new urgency into the process of responding to the findings of maternal death reviews.

How many mothers are dying? Why do they die and what is being done to prevent it?

Maternal death has been defined as: “the death of a woman while pregnant or within 42 days of the termination of pregnancy ... from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.” (17)

Despite significant progress in reducing the global burden of maternal mortality over the last quarter century, the common causes of maternal death in the 21st Century are frustratingly similar to those in 1990, or indeed at any other point in human history. Between 2003 and 2009, about 73% of all maternal deaths were associated directly with childbirth and resulted from causes such as obstetric haemorrhage – the leading cause of maternal death – hypertensive disorders and sepsis (18). These are classified as direct maternal deaths. A pregnant woman may develop a condition that does not have an obstetric cause but which may be aggravated by pregnancy and result in her death. This is classified as an indirect maternal death. Common indirect causes include pre-existing or newly developed conditions such as heart or kidney disease, malaria and HIV. The latter alone accounted for 5.5% of global maternal deaths.

The death of Urmila

Thirty-two-year-old Urmila had a history of tuberculosis. She died during her fourth pregnancy after developing severe breathlessness. Her family took her to seven different health facilities over five days, but eventually gave up hope of getting the care needed to save her and took her home, where she died.

DEAD WOMEN TALKING INITIATIVE (19)

Most of these deaths could have been prevented with quality care. More than 99% occurred in low- and middle-income countries (LMICs) – an estimated 302 000 in 2015. Of these, 201 000 occurred in sub-Saharan Africa and 66 000 in southern Asia. The estimated lifetime risk of maternal mortality is much higher in low-income countries: 1 in 41 compared with 1 in 3300 in high-income ones (20). More than half of all maternal deaths take place in fragile settings, such as countries that are experiencing crisis or conflict (21).

Correcting this imbalance is an urgent priority in the new era of the Sustainable Development Goals (SDGs). The first target under SDG 3 (ensure healthy lives) is to reduce the global maternal mortality ratio (MMR) to less than 70 per 100 000 live births by 2030 (22).

Proven interventions

Post-2015 strategies for ending preventable maternal mortality can be divided roughly into two strands: 1) promoting health and well-being throughout the life course by ensuring girls and women have access to quality health care and information, including family planning, within an enabling framework of human rights, equity and legal protection; and 2) ensuring mothers have access to quality antenatal, perinatal and postnatal care, and to emergency obstetric care when needed. Crucially, these provisions should be available to every woman at all times in every place, including in humanitarian and fragile settings. This is closely linked to the concept of universal health coverage and to the fundamental human right to health. The authors of the 2015 report, *Strategies Toward Ending Preventable Maternal Mortality*, summarized this as: "a shift from a system focused on emergency care for a minority of women to wellness-focused care for all" (23).

The *Global Strategy for Women's, Children's and Adolescents' Health* (24) draws on a range of sources to list more than 50 proven health interventions for women in pre-pregnancy, pregnancy, childbirth and the postnatal period. Some, such as screening for HIV to prevent mother-to-child transmission, relate to the health of both mothers and children. It also lists interventions for adolescent health and development, some of which may help to prevent future maternal mortality, such as counselling and services for comprehensive sexual and reproductive health, including contraception, and measures to prevent infection with HIV and other communicable diseases.

Recommended health systems policies and interventions are listed separately in the *Global Strategy*. Some have clear potential to reduce the incidence of maternal mortality, such as adequate recruitment, training, deployment and retention of health professionals and the availability of well-equipped health facilities. Others may have an indirect influence by contributing to an enabling environment for maternal health, such as laws and constitutions that guarantee women access to health care and services or that promote human rights, gender equality and equal economic opportunities.



WHO/TDR/A CRAGGS

Many of these policies and interventions are not new and have already gained wide acceptance. However, the Global Strategy for Women's, Children's and Adolescents' Health is generating powerful new momentum for the partnerships, resources and practical measures required to roll them out globally in an integrated way, so that all countries can achieve at least the levels reached by the best-performing middle-income countries. To this end, the newly established Global Financing Facility in support of Every Woman Every Child will work with countries to identify innovative sources of funding for women's, children's and adolescents' health, and help them to invest in supporting initiatives such as civil registration and vital statistics.

The death of Rita

Sixteen-year-old Rita, an adivasi woman from Jharkhand, India, died from eclampsia, a condition for which younger women are at much higher risk. The risk was not identified and acted on during her pregnancy. Rita had multiple problems while pregnant, including malaria, jaundice, swelling of her feet and face and night blindness, but received only the most basic of antenatal care.

DEAD WOMEN TALKING INITIATIVE (19)

Listen, learn, act: the role of maternal death surveillance and response

Overview

Maternal death review (MDR) is one of the cornerstones of maternal death surveillance and response (MDSR). It enables health professionals to understand when, where and why mothers have died and helps them design appropriate actions to prevent similar maternal deaths in the future. In a continuous action cycle, MDSR interprets the aggregated findings and suggests response actions, which are followed up on to ensure accountability.

In a country where only rudimentary arrangements existed previously, MDSR will provide a template for a comprehensive system that notifies all suspected maternal deaths, reviews probable maternal deaths, analyses the findings and implements and monitors recommendations for change. Although the core elements of the MDSR cycle are fixed (**Figure 1**), it is a flexible approach that strengthens capabilities, fills in gaps and makes the whole system more responsive and fit for purpose.

In most cases, MDSR will overlay or complement a country's existing arrangements. For example, it complements the system of integrated disease surveillance and response (IDSR), a strategy used to some degree in 86% of districts in Africa for comprehensive

Figure 1. A continuous action cycle



© UNFPA: JEROME SESSINI/MAGNUM PHOTOS



Why MDSR is needed

Country X is a low-income country with a high maternal mortality ratio (MMR). The government is committed to reducing preventable maternal deaths. Numbers declined significantly during the MDGs period, but the MDG 5 target was missed by a large margin.

Many maternal deaths go unrecorded or are misclassified because the system for civil registration and vital statistics (CRVS) is weak. The government aims to strengthen CRVS so that every death and cause of death is recorded accurately. It already reports annual maternal mortality statistics, but these reports are necessarily incomplete and capture only a proportion of all maternal deaths.

Country X has an established system of maternal death review (MDR), which operates mainly at facility level. Hospitals and clinics are supposed to report every suspected maternal death to facility MDR committees, which meet quarterly to review them. Occasionally community health professionals or civil society organizations report suspected maternal deaths that have occurred in the community. However, the perception of a "blame culture" around maternal mortality inhibits many people in health facilities and communities from contributing to MDRs.

Evidence presented to MDR committees varies greatly in terms of quality and completeness, and many suspected maternal deaths are never reported because the link to pregnancy or childbirth is unclear. Facility MDR committees report their findings to a district committee, which meets every three to six months. The district aggregates data and submits them to the ministry of health (MoH).

Everyone involved in this MDR process recognizes that it is inefficient, incomplete and too drawn out. Weeks may pass before a suspected maternal death is reported to a facility MDR committee, especially from the community. Months may pass before comments and recommendations are fed back from the MoH or district, and often none are forthcoming. By that time, all momentum for preventative action at the health facility or in the community may have been lost, and more women may have died from preventable causes.

public health surveillance of and response to notifiable diseases (25). The objective of IDSR is to improve the quality and availability of surveillance and laboratory data to public health managers and decision-makers. Where an effective IDSR system exists, maternal deaths can be easily integrated as another notifiable event, and the role of MDSR is typically to strengthen the response element in relation to maternal deaths and to ensure that causal factors are identified and communicated in a timely way.

MDSR evolved from the established system of MDR. However, it introduces a number of new elements that make MDR more timely, integrate all levels of the process from community level up to national level, improve the quality and manageability of data generated and ensure that recommendations based on data lead to action that saves the lives of women.

A common criticism of MDR systems is that their work often ends with the review. Either no action is taken, based on the findings, to prevent future maternal deaths or recommendations take far too long to filter back to local level. MDSR corrects this by requiring all MDR committees at facility and district level to report their findings and recommendations promptly up the chain to national level. It also monitors the implementation of recommendations that arise from the findings to ensure they are fit for purpose, disseminated in a timely way and acted upon.

The rapid cycle of notification, review, analysis and response enabled by MDSR gives countries the capability to monitor maternal mortality in near real time, both at subnational and national level, and can provide early warning of problems in a health facility or locality. Where appropriate and affordable, MDSR prioritizes the use of electronic and internet-based systems for reporting details of suspected maternal mortality, which can dramatically reduce the lag between notification and follow-up action.

It has been estimated that reported maternal mortality underestimates the true magnitude by up to 30% worldwide and by 70% in some countries (26). An effective MDSR system will produce more accurate and complete estimates of maternal mortality, providing robust and consistent data for a country's CRVS system. Where reliable CRVS systems do not exist – in about 60% of the world (27) – MDSR can

The death of Nayana

Twenty-five-year-old Nayana lived in the Azamgarh district of Uttar Pradesh, India. She belonged to a scheduled caste community and was suffering from tuberculosis. At the end of her fifth pregnancy she had a normal delivery in a community health clinic, and she and her baby were discharged. At home Nayana developed a fever. About a week after giving birth she was admitted to a private hospital where she died a few hours later.

DEAD WOMEN TALKING INITIATIVE (19)

provide a cornerstone of a new system, and contribute significantly to a country's "culture of accountability" by connecting action with results.

Key aspects of MDSR

Identification and investigation

MDSR includes a rigorous standard for identifying suspected maternal deaths. All deaths among women of reproductive age (15–49 years) in both health facilities and the community must be investigated to determine whether death occurred during pregnancy or the postpartum period (up to 42 days after delivery). The community is given equal weight with health facilities as a source of information about maternal mortality.



IAN HURLEY/SAVE THE CHILDREN, UGANDA



Advantage: ensures that all deaths of women of reproductive age are investigated as potential maternal deaths and that reviews are not limited to health facilities (many births globally still take place outside health facilities without a skilled birth attendant).

Notification

MDSR stipulates that maternal death should be a notifiable event and incorporated into a country's reporting system for notifiable diseases. Every suspected maternal death that occurs in a health facility must be notified to the MDR committee within 24 hours, and within 48 hours when a woman dies in the community.

Advantage: provides a legal imperative for everyone involved in the process to ensure that maternal deaths are identified and properly investigated.

The death of Dhani

Twenty-six-year-old Dhani was from a poor family in the Sonitpur district of Assam, India. Towards the end of her third pregnancy she started having pains and had difficulty passing urine. When labour began the dai (traditional midwife) helped her give birth, but Dhani began to bleed and died later that night. When asked why they did not call an ambulance to take her to hospital, the family explained the extreme difficulty of arranging transport at night from their isolated village, where a broken wooden bridge provided the only access.

DEAD WOMEN TALKING INITIATIVE (19)

Rapid reporting

The fastest means of reporting should be used, including mobile phones and the internet where available. MDR committees should meet regularly and frequently.

Advantage: places the emphasis on speed and efficiency throughout the MDSR process. Reporting often takes much longer in low-income countries and may be tied to a schedule of MDR committee meetings, which may occur infrequently or at irregular intervals.

Active surveillance

In addition to reporting all suspected maternal deaths, health facilities and communities should routinely report when no suspected maternal deaths have occurred. This is called zero reporting.

Advantage: this is a form of active monitoring that helps to ensure that the possibility of maternal causes is considered actively and consistently whenever a woman of reproductive age dies. It reminds people to look actively for cases of maternal death and links to the CRVS system by providing data for official vital statistics.

Maternal death review

All probable maternal deaths should be formally assessed by the MDR process at both facility and district levels to determine the medical causes of death and other factors that may have contributed. Ideally, deaths should be reviewed as soon as all relevant information is available but this is often not feasible, so every one to three months is recommended.

The death of Assetou

Twenty-one-year-old Assetou died while trying to reach a health facility in Burkina Faso after giving birth to a baby that did not survive. She died while being taken to hospital on the back of her brother-in-law's motorcycle.

AMNESTY INTERNATIONAL (28)

Advantage: this helps to ensure that cause of death is recorded accurately and that all circumstances, including non-medical factors, are taken into consideration. It provides accurate and complete data for official statistics. Non-medical factors give an insight into the avoidability of the death. For example, lack of financial means for transport to a health facility may be remedied by providing free ambulance transport for pregnant women.

Corroborating evidence

In addition to autopsy reports and medical opinion, MDR committees should actively seek testimony from outside the health profession, particularly when a death has occurred in the community. Verbal and social autopsies are established methods of gathering feedback from family members and others who may have had contact with the deceased in the period leading up to her death. They may help the MDR committee understand non-medical factors that contributed to the woman's death.

Advantage: reduces the possibility of critical factors leading to a maternal death being overlooked or misinterpreted. Creates a broader evidence base on which to ground recommendations for preventative action in future and increases the avoidability of preventable maternal deaths.



Analysis

Effective analysis of MDSR data is essential to provide the MoH and other health authorities with meaningful information on which to base plans for reducing maternal mortality. Analysis and aggregation should take place within an agreed framework and use specified indicators. Analysis should be conducted at the level closest to the community where the appropriate analytical skills exist, and no higher than district level. Data sources should be triangulated at the district level to eliminate the possibility of double counting of maternal deaths (for example when the same death is reported by both a facility and a community).

Advantage: a rigorous and consistent system of data analysis will help the MoH accurately identify causes of death, risk factors, groups at highest risk, contributing factors and emerging data patterns, and to prioritize and respond to health problems.

Response

A key principle of MDSR is that findings from maternal death reviews should trigger an immediate response to prevent similar deaths from occurring. While this will often come in the form of scheduled feedback from the district level or higher, a more timely response should occur at facility or community level when evidence exists to support it. For example, where failings in basic hygiene have been identified as a contributing factor in a woman's death from sepsis after giving birth at a health facility, the facility committee may immediately instigate improved procedures for hand washing. The system should include arrangements for disseminating recommendations based on reviews or data analysis – whichever level they emanate from – and for monitoring to ensure that recommendations are implemented.

Advantage: this ensures that appropriate action is taken rapidly to act on findings from maternal death reviews. Creates a cycle of improvement.

Wider benefits of MDSR

“ Every misclassified or unrecorded maternal death is a lost opportunity to take corrective action to ensure that other women do not die in the same way. ”

TIME TO RESPOND

Supporting civil registration and vital statistics

Accurate and comprehensive information about the causes of maternal mortality can be difficult to acquire. The scale of the problem is indicated by recent confidential enquiries into maternal deaths (CEMDs) in Kazakhstan and South Africa. Respectively, they identified 29% and 40% more maternal deaths than were initially recorded by those countries' civil registration and vital statistics (CRVS) systems (29). For a CEMD, a multidisciplinary group is convened to review all high-level de-identified data on maternal deaths and to produce findings that feed into national guidelines and health programmes.

Low- and middle-income countries (LMICs) usually have weak health systems, small-scale or no CRVS systems and no CEMD processes to rectify discrepancies, so acquiring accurate information about maternal deaths is even more difficult than elsewhere. Many deaths, maternal or otherwise, go unrecorded or are incorrectly classified, which results in under reporting of maternal mortality. But absence of data is only part of the problem, and not the most significant. Every misclassified or unrecorded maternal death is a lost opportunity to take corrective action to ensure that other women do not die in the same way. The purpose of an MDSR system is to help countries ensure that these opportunities for learning and action are not missed.

A recent review of progress on implementing the recommendations of the Commission on Information and Accountability (CoIA) noted that both MDSR and CRVS systems perform better in countries where both are prioritized (30). For example, in Malawi the MDSR system is expected to strengthen CRVS by collecting data using the International Classification of Diseases (ICD-10) standard for maternal mortality (ICD-MM) (31). In Nepal, the CRVS and MDSR systems will use the same verbal autopsy questionnaires to collect informa-



WHO/SEARO/V GUPTA-SMITH



tion on suspected maternal deaths, which will streamline the passage of information between the two systems (32).

Although MDR is an established and trusted approach, practice varies greatly. Some MDRs focus almost exclusively on medical causes of maternal death and fail to take account of social or environmental factors and the testimony of people who are not health professionals. MDSR explicitly corrects this imbalance. It formally encourages family members, friends and neighbours to contribute to the review process, because their statements may provide crucial evidence that is missing from medical reports and reviews. This is highlighted in a case study contributed to the MDSR baseline survey by the Dead Women Talking Initiative of India, which focuses on the efficacy of a social-autopsy approach in teasing out crucial details about the circumstances of a maternal death (33). It observed that conventional MDRs usually fail to reflect the full range and complexity of factors contributing to maternal deaths, especially those related to health systems. It also noted that conventional MDRs may carry an underlying tone of blame, which discourages family and community members from contributing – a theme that emerges strongly in other case studies.

Improving quality of care

When correctly implemented and consistently applied, MDSR will lead to improvements at all levels of the health system and to the care of mothers and pregnant women in the community. Improvements to quality of care are a key objective of MDSR. Evidence reviews and analysis of data should identify when and how inadequate care has contributed to maternal mortality, and lead directly to recommendations for improvements. For example, a CEMD in Moldova between 2006 and 2008 found that two leading causes of maternal mortality – haemorrhage and sepsis – were under reported in official statistics. Based on this, the CEMD made recommendations for improved clinical management of the conditions and for the updating of professional guidelines. It also made recommendations for raising awareness of the conditions at community level, and of the need to seek urgent medical attention (34).

In Jigawa State, Nigeria, the MDR process at one health facility found that 65% of all maternal deaths occurred at night because the most highly qualified midwives mainly worked during the day. This led to a redistribution of shifts to mix more experienced staff with those with less experience (35).

The death of Tina

Twenty-two-year-old Tina suffered convulsions eight hours after giving birth to her first baby at home in the Godda district of Jharkhand, India. Tina's family called the accredited social health activist (ASHA), who came to see her but did not think her problem was serious, even though her training should have told her that Tina's convulsions were a serious cause for concern. Tina's family later set out to take her to hospital, but she died on the way.

DEAD WOMEN TALKING INITIATIVE (19)

Monitoring implementation of MDSR

Background to the MDSR baseline survey

One of the 10 recommendations of the Commission on Information and Accountability (CoIA) encouraged countries to take action to improve registration of births, deaths and causes of death for women and children. This has informed the decision of countries and donors to make MDSR and CRVS key components of their investment plans.

About 100 countries reported having elements of an MDSR system in the 2014 WHO-MNCAH policy indicator survey. However, the degree to which MDSR has been implemented varies greatly across these countries and until recently there has been no consistent and comprehensive information about the status of countries' MDSR systems.

To rectify this, the World Health Organization (WHO) collaborated with the United Nations Population Fund (UNFPA) to conduct a global baseline survey of the implementation of MDSR. The survey would provide a snapshot of implementation in 2015 and serve as a baseline for future monitoring of progress, and the results would enable better targeting of technical support for country implementation.

Methodology

WHO and UNFPA developed a survey questionnaire based on indicators of MDSR implementation (**Annex 1**). The 46 questions were organized under five headings: Policy indicators; Identification and notification; Review; Response; and Reporting.

The questionnaire was circulated to countries through WHO and UNFPA regional offices in April 2015. Responses were received between May and September 2015 from 67 countries, 64 of which were low- and middle-income countries (LMICs) (**Table 1**). Countries were also invited to provide evidence on implementation of MDSR in the form of case studies.

Essential components of MDSR

Findings from the MDSR baseline survey responses were supplemented with information on MDSR from the WHO-MNCAH policy indicator database to build a picture of the current status of MDSR implementation in LMICs. Analysis focused on identifying whether countries had implemented the following core components of an MDSR system:

- A national policy to notify all maternal deaths
- A national policy to review all maternal deaths
- A national maternal death review committee
- A subnational maternal death review committee
- Both national and subnational maternal death review committees in large countries
- At least biannual meetings of the national maternal death review committee
- An annual national MDSR report to disseminate findings and recommendations.



Table 1. The 64 LMICs that responded to the MDSR baseline survey

AFRICA REGION		AMERICAS REGION	EASTERN MEDITERRANEAN REGION	EUROPEAN REGION	SOUTH-EAST ASIA REGION	WESTERN PACIFIC REGION
Benin	Kenya	Guyana	Afghanistan	Moldova	Bangladesh	Cambodia
Botswana	Madagascar		Iran	Ukraine	Bhutan	China
Burkina Faso	Mali		Iraq	Uzbekistan	Democratic People's Republic of Korea	Fiji
Burundi	Mauritania		Lebanon		India	Kiribati
Cameroon	Mozambique		Morocco		Indonesia	Lao People's Democratic Republic
Central African Republic	Niger		Pakistan		Maldives	Malaysia
Chad	Nigeria		Somalia		Myanmar	Mongolia
Congo	Rwanda		Sudan		Nepal	Nauru
Cote d'Ivoire	Senegal		Syria		Sri Lanka	Papua New Guinea
Democratic Republic of the Congo	Sierra Leone				Timor-Leste	Vanuatu
Eritrea	South Sudan					
Ethiopia	Swaziland					
Gabon	Tanzania					
Gambia	Togo					
Ghana	Uganda					
	Zambia					

Source: WHO-UNFPA MDSR Baseline Survey 2015.

National policies to notify all maternal deaths within 24 hours in facilities and 48 hours in communities, and to review them systematically through subnational and national maternal death review committees, are fundamental to the MDSR cycle. Regular, scheduled meetings of the national maternal death review committee are necessary to ensure that the upward flow of information from lower levels of the health system receives prompt attention and response.

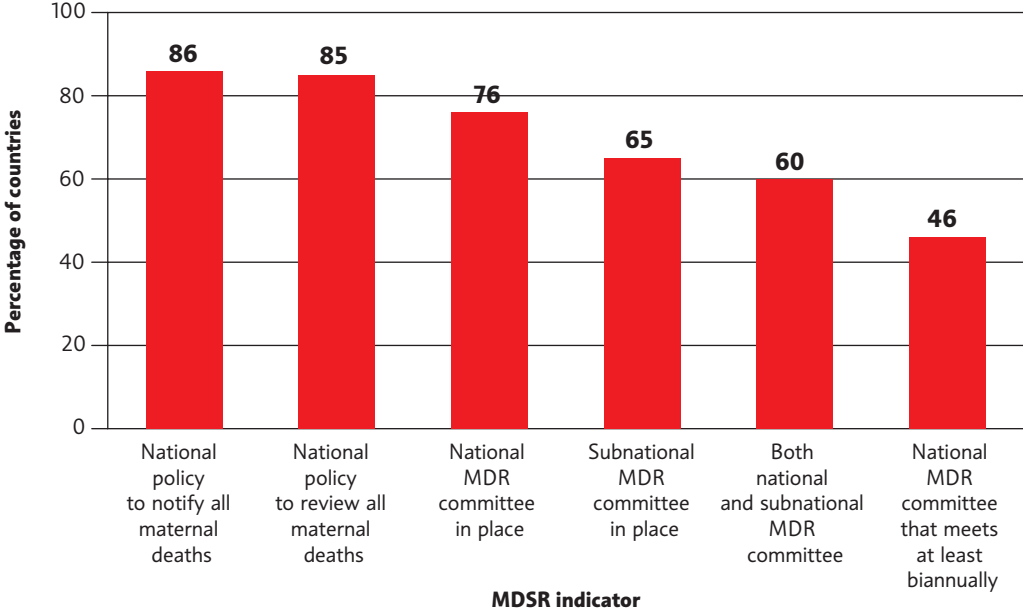


WHO/SEARO/ISLAM

Current global status and implementation

The MDSR baseline survey sought to establish the prevalence of key elements of MDSR in the countries surveyed. These correspond to the essential components of MDSR referred to in the previous section. **Figure 2** shows the reported state of implementation for 103 countries. Data on 64 are from the MDSR baseline survey and the remainder from the WHO-MNCAH policy indicator database. **Figures 3 and 4** provide an historical perspective on the adoption by countries of national policies to notify all maternal deaths and to review all maternal deaths.

Figure 2. The current status of MDSR implementation in low- and middle-income countries (N=103)

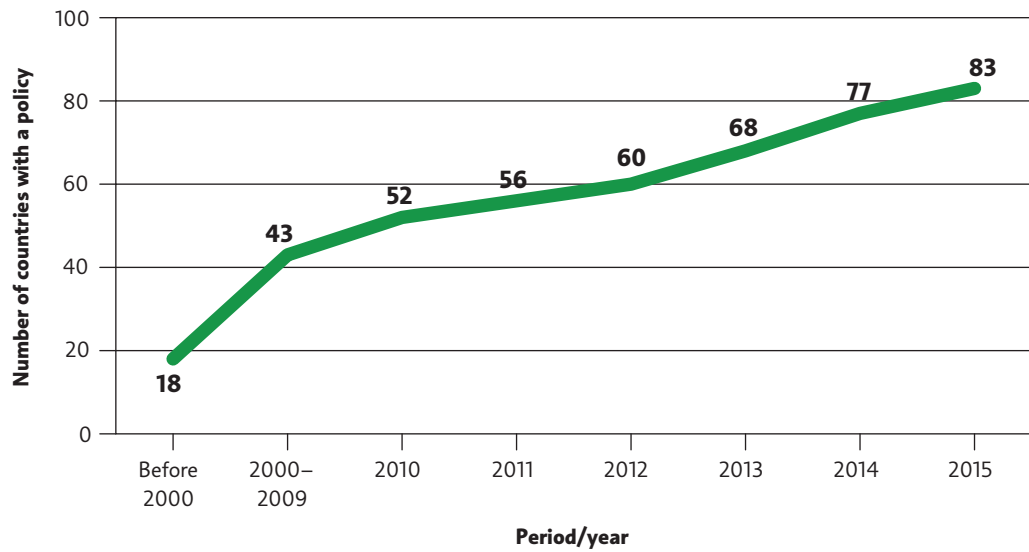


Source: WHO-UNFPA MDSR Baseline Survey 2015 and WHO MNCAH Policy Indicator Database 2014.

In **Figure 2**, the high percentages of countries with national policies to notify all maternal deaths (86%) and to review all maternal deaths (85%) indicate significant policy commitment to two prerequisites for MDSR in those countries that responded. Figures 3 and 4 suggest that progress towards these levels accelerated in the years after 2010, coinciding with the Global Strategy for Women’s and Children’s Health, the Commission on Information and Accountability, the origins of MDSR and the subsequent publication of technical guidance.

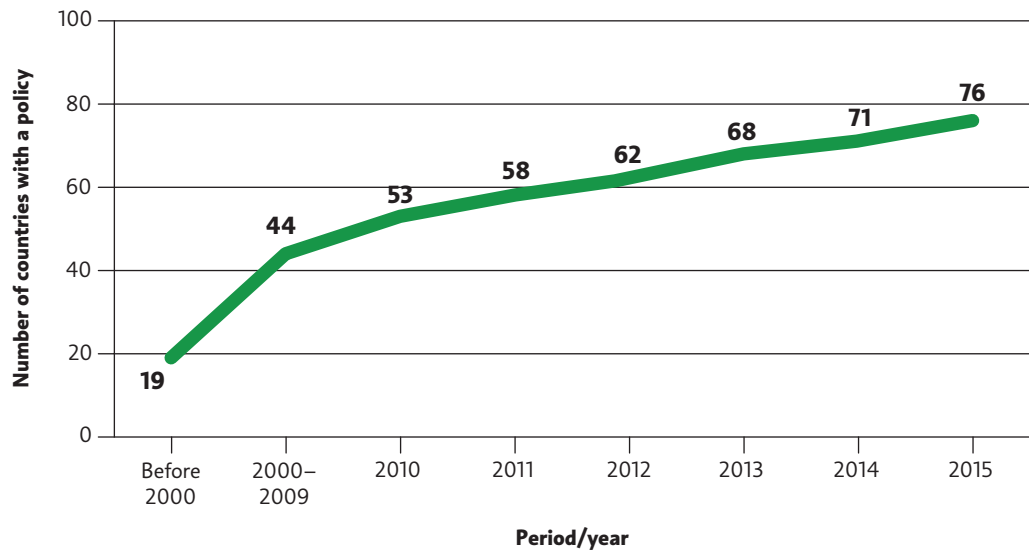
However, the other findings presented in **Figure 2** suggest a lag between policy and practice in a significant proportion of countries. Only 76% of countries (76/100) had maternal

Figure 3. Periodic progress in implementation of a national policy on notification of all maternal deaths in low- and middle-income countries



Note: Year information not reported for 6 countries with policy.
 Source: WHO-UNFPA MDSR Baseline Survey 2015 and WHO MNCAH Policy Indicator Database 2014.

Figure 4. Periodic progress in implementation of a national policy to review all maternal deaths in low- and middle-income countries



Note: Year information not reported for 11 countries with the policy.
 Source: WHO-UNFPA MDSR Baseline Survey 2015 and WHO MNCAH Policy Indicator Database 2014.

death review committees at national level, and 65% (64/99) at subnational level. MDSR guidelines specify that the national maternal death review committee should meet at least biannually, but the survey indicated that only 46% of countries (46/100) were operating to this standard. In the case of countries whose committees meet less than biannually, the functioning of the MDSR system may be sub-optimal, due to the importance of frequent reviews at all levels to maintain the loop of surveillance and response.

central Asia, south-east Asia and Oceania. Most of the countries concerned do nevertheless have national policies on maternal death review.

The combined findings of the MDSR baseline survey and the WHO-MNCAH policy indicator database offer a good summary of global implementation status in 2015. Although they indicate the widespread adoption of important elements of the MDSR system, they also highlight the lack of progress towards full implementation in numerous countries. The existence of a national policy does not guarantee the application of MDSR principles and processes at subnational level. Likewise, the existence of national and subnational maternal death review committees does not guarantee that they are functioning. Of particular concern is the disparity between the percentage of countries with a national policy for notification of maternal deaths (86%) and the application of the policy on the ground. Notification is the most fundamental element of MDSR because without it the review, analysis and response elements cannot function.

Narrative evidence from the survey case studies and elsewhere indicates a gap between policy and reality. For example, a review led by the Centre for Maternal and Newborn Health (CMNH) at Liverpool School of Tropical Medicine (LSTM) of all maternal deaths in Kenya notified and reviewed between 2004 and 2006 found significant under reporting. Only 46% of maternal deaths reported via the health management information system were notified from the MDR system (36). The review also showed poor compliance with the MoH circular on maternal death notification. Kenya is not unique in these failings around notification (see the examples from Kazakhstan and South Africa above in the section on CRVS and from India in the section on community and civil society engagement below), which should be a focus of improvement efforts in all countries. The example below from the Saving Mothers, Giving Life initiative (SMGL) in Uganda illustrates how notification levels can improve when community health teams are trained to identify and report deaths among women of reproductive age. In the SMGL example, reductions in maternal mortality were observed subsequently.

These survey findings are complemented by the case study evidence summarized in the following sections. Together they suggest that the immediate challenge in global MDSR advocacy and implementation is to support countries in their efforts to follow through on their policy commitments and complete the loop in the surveillance-response cycle. In particular, this requires a focus on improving levels of maternal death notification and on building and strengthening mechanisms for response at all levels.

Country case studies: MDSR in action

Eighteen countries responded to the MDSR baseline survey's request for case studies about the implementation of MDSR or elements of MDSR, and in some cases provided more than one. They cover a wide range of subjects, such as verbal autopsy, facility-based maternal death reviews and the application of mobile technologies for data collection and transmission. Some offer an overview of the experience of transitioning to MDSR and building on existing surveillance arrangements, particularly maternal death review (MDR).

Case studies are a valuable element of the MDSR baseline survey findings in several ways. Firstly, they give examples of how countries seek to convert policy into practice and fulfil their commitments to notify, review and respond to all maternal deaths. Secondly, they provide detail of how elements of the MDSR system work in different country contexts, including through the application of innovative approaches and technologies. Thirdly, they highlight barriers to efficient functioning of the various elements and to full implementation of MDSR. The first two points are considered below, and the third in the next section.

Policy into practice

“ Reviews focus on improving the system...identifying larger policy gaps as well as simple gaps in the system such as stock-outs of life saving drugs at pharmacies. ”

PHILIPPINES CASE STUDY (37)

Several case studies directly address the country experience of adopting MDSR. Burkina Faso reported success in integrating MDSR into its existing system of integrated disease surveillance and response (IDSR), which has improved coordination between vertical programmes for diseases such as HIV/AIDS and malaria and among partners and stakeholders (38). As a result, it reported being able to advise several sub-Saharan countries, including the Democratic Republic of the Congo and Guinea, on implementing their own MDSR systems.

In Ethiopia, the Federal Ministry of Health instigated an MDSR training programme following the launch of the country's system in May 2013, which was cascaded down from national level to health professionals at the regional, zonal and district levels (39). By the end of 2014, the MDSR system had been introduced in 17 zones, covering about 40 million people in an estimated national population of 95 million.

The Philippines reported a relatively smooth transition to MDSR after 2013, largely due to its established system of maternal death reporting and review (MDRR) (40). A significant change was the new emphasis on the response element of MDSR. This was reflected in

the adoption of national policies on implementing health reforms to reduce maternal and newborn mortality rapidly, on the licensing and regulation of midwifery clinics and birthing homes, and the conduct of maternal death reviews.

Tanzania was in the process of rolling out its system of maternal and perinatal deaths surveillance and response following the compilation of national guidelines and accompanying tools in 2015, with assistance from Evidence for Action (E4A). Training and supervision packages will focus on strengthening the quality of maternal death review and the action and response cycle (41).

Country context

“ Mapping another country’s success on to our own would not be the best way. Rather, tailoring the learning from other successes to suit our own needs is certainly recommended. ”

MALAYSIA CASE STUDY (42)

The Dead Women Talking (DWT) initiative from India contributed several case studies that highlighted the importance of adapting the elements of MDSR to country context, and to the social, cultural and economic conditions in which people live (43). For example, one case study examined the application of the social determinants approach to maternal deaths in parts of India, and how this takes account of local context (44). The approach looks at the deceased woman holistically, including her age, where she lived, her family background and her economic status. It also examines structural issues such as laws, dominant social attitudes towards women and gender norms. Among numerous examples, the case study highlighted how gender status can indirectly lead to maternal death, describing the case of one mother with a diagnosed heart condition. While she already had three children, including one son, the higher value placed on sons in her culture compelled her to risk her life in another pregnancy, with fatal results.

In Bangladesh, the social autopsy approach has been used to overcome obstacles to communication between communities and government health officials seeking information about maternal deaths (45). It was introduced as an integral part of the country’s system of maternal and perinatal death review (MPDR) in 2010 and has been scaled up in 14

districts. As many as 40 people from the community may be involved in each social autopsy. This level of participation has been effective in gathering information for maternal death reviews and in helping people find their own solutions to prevent similar deaths in future. For example, a mother died in a village in the Thakurgaon district from postpartum haemorrhage due to retained placenta. The social autopsy revealed that the woman had received no antenatal care during pregnancy and no support with birth planning, and had delivered at home



with the help of a traditional birth attendant. A woman who participated in the social autopsy, Mina, was seven months pregnant at the time. As a result of what she learned, she decided to seek antenatal care and deliver in a health facility. She subsequently gave birth in hospital and came home healthy a day later with a healthy baby.

Another Dead Women Talking case study described the involvement of civil society organizations (CSOs) in maternal death reviews, and how the CSOs' established network of contacts at community level put them in a strong position to pass on information about maternal deaths to the health authorities. Although this led to increased reporting of maternal deaths, it also created tensions with some local health professionals, who felt they were being undermined or compromised by the involvement of CSO personnel. The CSOs' activity was seen to breach the strict hierarchy within the culture of the local health system, and possibly to expose the health professionals to accusations of negligence. The CSOs adapted their approach by simultaneously informing local health professionals when they alerted the health authorities (46).

The role of innovation

By definition, innovation has an important role to play in scaling up MDSR systems and making them more effective, because systems that are incomplete or inefficient will often benefit from the introduction of new ideas or methods. Innovations in MDSR typically take two forms: new approaches and/or new technologies.

Innovative approaches

Several of the survey case studies broached new approaches, particularly in the area of identifying the causes of maternal deaths and contributing factors. In Uganda, the Saving Mothers, Giving Life initiative (SMGL) trained more than 4000 village health teams (one for 100 to 300 households) in how to identify and report any deaths of women of reproductive age through routine monthly monitoring visits (47). Suspected maternal deaths are subsequently investigated by a team trained in conducting verbal autopsies. A follow-up study found a 30% reduction in maternal mortality in four districts in Uganda. In 2015, the SMGL districts introduced perinatal surveillance activities. Sierra Leone has introduced a Maternal Survival Action Network championed by the First Lady, Sia Nyama Koroma (48). The network brings together key influencers and opinion-makers in Sierra Leone – including clinicians, parliamentarians, community leaders, CSOs and media – to share evidence, advocate for resources and follow up on recommendations generated by the MDSR system. The Dead Women Talking initiative from India, mentioned elsewhere, is another example of an innovative approach.

Innovative technology

The MDSR technical guidance recommends the use of technology, where appropriate, to simplify the collection, transmission and administration of health information. Potentially this can save time and money and increase the number of deaths reported, especially when the technologies are effectively integrated with health management information systems. For example, in 2009 the Bonaaso Millennium Villages Project in Ghana introduced an electronic system known as Open Data Kit2 to record information obtained during verbal autopsies in the community. On completion of the verbal autopsy, a mobile phone is used to transmit the data to a central database, where it is available for immediate analysis. Users of the system reported that the availability of real-time mortality data enabled



them to identify issues more quickly and take action to resolve them (49). In Jigawa State, Nigeria, E4A plans to trial a system that enables health professionals to use MDR tools on electronic tablets. This is intended to speed up the collection and use of data compared to the current paper-based system (50).

Community and civil society engagement

Groups and individuals outside the health sector can play an important role in the MDSR cycle. However, the MDSR baseline survey found only limited participation of community-based organizations, with only 23 countries reporting having a policy on community representation in subnational maternal death reviews.

The MDSR technical guidance lists community, religious and political leaders, action groups, CSOs and the police as "key informants" in the process of notifying maternal deaths. In places where MDSR works well, they will cooperate effectively with midwives and other community health professionals, staff at the community health facility and district health

officials. However, this ideal state of affairs will not arise of its own accord. National and subnational MDSR planning should include arrangements for community engagement, with the aim of raising awareness of MDSR and building trust in the process and its objectives. CSOs may also initiate action, as in the example below.

The survey case studies provide examples from the Dead Women Talking (DWT) initiative of effective community engagement and work with CSOs to support MDSR in India. DWT was created in 2012 when several CSOs, led by CommonHealth, came

together to initiate action to reduce maternal mortality and improve reporting of maternal deaths, particularly among marginalized, poor and vulnerable populations. At that time, the Indian government acknowledged that only 18% of suspected maternal deaths were being reported through the MDR process (51). Of these, only two thirds were being reviewed by the district MDR committee, whose focus was mainly on establishing the medical cause of death without also identifying gaps in the health system and instigating corrective action.

To get beyond the official statistics, and to record the authentic stories of people affected by maternal mortality, DWT developed a new social autopsy tool, which CSOs used to document the circumstances of 124 maternal deaths in 10 states over a two-year period (52). In addition to recording in detail the harrowing experiences of the women who died, the final DWT report made extensive recommendations for correcting "huge failures of the health system" and introducing policies and systems that take full account of the social determinants of health. It noted the importance of open discussion of issues around maternal mortality and of involving community leaders, community organizations and CSOs in working with the health sector to tackle these problems (53).



OHM

Barriers to progress: current implementation difficulties in countries

“ An MDSR system is more likely to be successful if certain regulations and legal protections are in place. ”

MDSR TECHNICAL GUIDANCE (5)

The legal environment

To complement the findings of the MDSR baseline survey, WHO commissioned a three-month global study that examined legal and other obstacles to full implementation in countries where maternal death review (MDR) and MDSR are active (54). The study reviewed the global and regional framework of international law and human rights within which MDR and MDSR operate, including the Convention on the Elimination of all Forms of Discrimination Against Women, the Convention on the Rights of the Child, the International Covenant on Economic, Social and Cultural Rights and a number of regional human rights instruments, such as the African Charter on Human and Peoples' Rights. It noted that the right to health is included in several international human rights treaties.

A literature review conducted for the study found little literature that considers MDSR from a legal perspective. This perhaps reflects the relatively recent origins of MDSR and its implementation by countries. However, the review did highlight the impact of country law on the rights of women, and by extension on their reproductive rights. For example, the legal age of marriage and the legality or otherwise of abortion may have a significant impact on the maternal mortality rate. Women's legal right to education and to participate in the workforce may have an indirect impact, as may other social and economic factors.

In broad terms, the legal environment within which a country seeks to implement MDSR can either assist or hinder the system's effectiveness as a tool for reducing maternal mortality. In the examples given above, the existence of an efficiently run MDSR system cannot fully mitigate the risks to girls who marry and conceive at a young age, or to women who seek to terminate a pregnancy in a country where abortion is illegal. Conversely, a favourable legal and human rights environment will assist the operation of MDSR. Taking a human-rights-based approach to health, making maternal death a notifiable event in law, and supporting this with policies for maternal death review, analysis and follow-up action, creates the preconditions necessary for successful implementation.

The wider context

A survey published online for the study, and 14 follow-up interviews, provided quantitative and qualitative data from 389 respondents. Through analysis of these, the study authors identified six thematic areas where barriers to MDSR implementation exist, and made recommendations for overcoming them:



1. Awareness

All stakeholders need to understand the purpose and principles of MDR and MDSR, and in particular frontline workers. To this end, awareness-raising activity is essential.

2. Blame culture

MDSR may be seriously hampered by the existence of a blame culture. People involved in the process may withhold important information if they fear reprisals or disciplinary action following an MDR. A culture of openness and transparency, underpinned by the principles of “no blame” and de-identified data, is required. Legal provisions related to confidentiality and medical liability will help to allay fears about participating in MDR. The MDSR technical guidance recommends: “legal safeguards should be in place to prevent the use of the review findings in litigation” (55).

3. Staff and training

Staffing levels are a key factor in the effective operation of MDSR. Many countries report having insufficient numbers at all levels to cover all the work needed to prepare for MDRs, conduct them and perform follow-up activities. Those staff who are available require appropriate training for their specific roles in MDR/MDSR. It should be timely and not provided solely because a review is imminent or has recently occurred. Training fills gaps in the knowledge needed to accurately assign cause of death and report data within the MDSR system. However, sufficient resources are often unavailable to fund all the training needed.

4. Data collection

Clear policies and guidelines are required to ensure data collection activity is timely, thorough and fit for purpose. Systems should be robust, and all individuals should understand their roles and responsibilities for collecting data.

5. Follow-up and sustainability

Findings must be acted on if the system is to work as intended. Timely action is required at two levels: at institutional level immediately after a death has occurred, and at national level as a result of data feeding up from local level. Follow-up action “must have at its heart the desire and commitment to enhance maternal health, rather than administering blame or punishment” (56).

6. Financial resources

Lack of financial resources may be a major barrier to implementation. Countries frequently have to rely on external funds and on nongovernmental organizations to progress with MDSR implementation, scale-up and monitoring. Where resources are available, implementation should be driven by clear leadership, long-term vision, strategy and commitment.

In summary, the study recommends that countries ensure these building blocks are in place in order to implement MDR and MDSR in full. They should also take account of the socio-economic and cultural landscape and the legal and human rights framework within which the systems operate.

Narrative evidence

The findings of the study described above were reflected in the MDSR baseline survey findings and case studies, which also indicated that some countries were hindered from fully implementing MDSR by the absence of legal and policy provisions, blame culture, lack of resources and other challenges.

The lack of a legal framework was noted as a factor in the Kenya case study (57). The country had made maternal death a notifiable event via its health management information system in 2014, and trained health professionals at all levels in workshops. However, a follow-up review showed that overall notification and reporting of maternal deaths had not improved, partly due to health professionals' fear of litigation based on MDR findings. It is hoped that new legislation will provide a legal framework for MDSR in Kenya.

Evidence for a blame culture emerged in several instances. According to the case study from Moldova, the previously used system of investigating maternal deaths "instilled fear" in the country's health professionals, who were afraid of being prosecuted for perceived mistakes. This sometimes led to falsification of medical documents to conceal the true circumstances of death (58). Some health professionals in Malawi were reluctant to report maternal deaths for fear of being blamed and subsequently disciplined (59). The Malaysia case study concludes that it is essential for the MDR process to be non-punitive and to avoid "naming, blaming or shaming" (60).

Lack of resources, staff shortages and lack of training were common barriers to implementation in many of the countries that responded to the MDSR baseline survey. As noted in the Cameroon case study, sustainable financial and human resources are required to maintain a system of facility-based maternal death reviews (61). The absence of appropriately trained staff can impact on the quality and effectiveness of the whole system. However, as noted in the Malaysia case study, significant improvements can be achieved in settings where resources and funding are scarce (62).

Other barriers to implementation

In many of the examples highlighted in the survey findings and case studies, implementation had focused on the notification and review elements of MDSR without fully "closing the loop" through a consistently applied and effective response at national level. Some countries lacked the coherent strategy and mechanisms needed to make the response element work. These points are reflected in the MDSR baseline survey finding that only 46% of countries responding had a national maternal death review committee that met at least biannually. The MDSR baseline survey case studies highlighted several areas that may help to account for this lack of follow-through.

Political buy-in

As noted above, the existence of national policies for maternal death notification and review does not guarantee implementation at subnational level. Several countries emphasized the importance of sustained political and administrative buy-in for the success of MDSR. Malaysia advocated a "top down approach" backed by strong political will (63). Nigeria noted that enforcement of existing national policies could help to improve reporting of maternal deaths (64).

Long-term vision

Full implementation of a national MDSR system requires a clear long-term vision of the system's objectives that is allied to a coherent strategy for achieving them and backed by sufficient resources to deliver success. As Beyond the Numbers remarked in the context of confidential enquiries into maternal deaths, MDSR should be "based on vision but grounded in reality" (65).



Multiple actors

The importance of involving multiple actors in MDSR emerges strongly from the country case studies. Ministries of health and health sectors cannot guarantee successful implementation without support from other ministries, civil society organizations, communities, nongovernmental organizations and stakeholders. The India case study on social determinants stated that “silo’ed approaches” can lead to inefficient investment of resources and weaker health systems, and that a range of stakeholders needs to be engaged in the MDR process (66). Malaysia advocated engaging all the major stakeholders in the system, including from the public and private health services, academia, nongovernmental organizations and politics (67).

Commitment from health professionals

The Nigeria case study on facility-based maternal death review stated that MDSR implementation relies on the commitment and cooperation of all health professionals (68). This applies across the MDSR system at all levels. However, people may be resistant to changed priorities and working practices for a wide variety of reasons. As noted elsewhere, fear of disciplinary action or litigation resulting from involvement in maternal death reviews emerged as a common theme.

Lack of budget line

Shortage of resources frequently results in a lack of budget for MDSR activities, and this is often a strong barrier to scale-up. However, even at relatively low levels of implementation, MDSR can work to generate its own budget line by highlighting trends in maternal mortality and providing evidence of the need for specific interventions or improvements. This may lead to budget allocation by the ministry of health or subnational authorities.

Cultural norms and practices

Local cultural norms and practices may impede or slow down the MDSR process. For example, in Malawi families and friends typically engage in at least a seven-day mourning period, which makes it difficult for health professionals to complete verbal autopsies in the community within 48 hours of a maternal death (69). The case study from India on social autopsies highlighted the significance in cases of maternal mortality of factors such



IAN HURLEY/SAVE THE CHILDREN, UGANDA

as caste and ethnicity, migrant status and gender issues within the family (70). These may also impact on the effectiveness of the MDSR cycle by increasing the difficulty of obtaining comprehensive, unbiased information about a maternal death.

Geography and infrastructure

Long distances, inaccessible terrain and lack of communications may all impede MDSR. The Burkina Faso case study noted that reporting of maternal deaths often takes longer from remote, hard-to-reach communities that are not connected to the telephone network or are a long way from medical facilities (71). A similar story emerged from the Bangladesh case study on maternal and perinatal death review. Notification of maternal deaths from communities in hard-to-reach areas can take up to one month, compared with the one week specified by national guidelines (72).

The death of Mariam

Twenty-three-year-old Mariam died in hospital in Ouagadougou, Burkina Faso, 13 days after giving birth to twins: one stillborn and one who survived. After her death, Mariam's husband described how he was continually asked to pay for tests and medical supplies during her care. Mariam's eldest brother said: "The hospital, it is like a chamber of commerce. If you are poor, you are 'left'; if you can pay, you are treated."

AMNESTY INTERNATIONAL (28)

Data collection

The Malawi case study on facility-based review remarked that: "the quality of data collected in MDR forms depends on the ability of those completing it" (73). However, forms that are badly designed or incomplete can also be a factor in the ability of health professionals to provide good-quality data. Investments are required to improve systems of data collection, including through training and the production of data-collection tools that are fit for purpose. Where appropriate and affordable, electronic and phone- or internet-based systems may be used to increase the speed and efficiency of data collection.

Data analysis and trends

Regular monitoring and analysis of cause-specific mortality data across time – from all levels of the health system and communities – are required to identify trends in maternal mortality. This is a crucial aspect of the national MDSR system, providing countries with evidence about the effectiveness of interventions and indicating where improvements are required. In addition to district-level identification of patterns and trends, countrywide mapping of maternal deaths is important. These maternal-mortality maps may be overlaid with information about population, natural environment, climate, infrastructure and other data to build a picture of factors that may contribute to the causes of maternal mortality.



Global support for MDSR implementation

Technical assistance on implementation of MDSR has been requested by almost all countries since the publication of the Commission on Information and Accountability (CoIA) recommendations in 2011 and the MDSR technical guidance in 2013. The World Health Organization (WHO), its regional offices and partners have been working to support these countries through a programme of capacity-building workshops and training.

MDSR Working Group

This group was formed to coordinate and lead efforts to encourage the global adoption of MDSR and to promote understanding of its various elements. The group is chaired by WHO and includes representatives from:

- World Health Organization
- United Nations Population Fund
- International Federation of Gynaecology and Obstetrics
- International Confederation of Midwives
- United States Centers for Disease Control and Prevention
- UK Department for International Development
- Canadian Network for Maternal, Newborn and Child Health
- Liverpool School of Tropical Medicine
- Evidence for Action.

One of the group's first tasks was to formulate and publish MDSR technical guidance in 2013. It meets biannually and continues to guide the development of MDSR globally.

Action network

In October 2012, the MDSR Action Network was launched at the International Federation of Gynaecology and Obstetrics (FIGO) World Congress. Hosted by the Evidence for Action programme, the network is a focal point for the aggregation of information about MDSR, and promotes knowledge sharing among its 400 members in 70 countries. In April 2013, the network published the first of a series of regular newsletters including updates on MDSR implementation, reports and case studies.

Capacity-building workshops and training

The MDSR Working Group organizes global, regional and country workshops to build country capacity in MDSR. After the publication of the MDSR technical guidance, WHO hosted a workshop in London from 9 to 11 September 2013, which brought together 30 participants from 23 countries to orient global experts in maternal death review (MDR) to the new MDSR approach. All priority countries were oriented to MDSR through WHO

regional and subregional workshops. Workshops were convened at FIGO regional meetings in Addis Ababa and Colombo, and UNFPA also organized several regional workshops.

Recent events included a global workshop on 4 October 2015 hosted by WHO and UNFPA at the FIGO World Congress in Vancouver and a workshop in the Maldives in February 2016. The former included presentations and discussion sessions on five themes:

1. Death notification
2. Data, communication and advocacy
3. Funding agencies
4. Professional society involvement
5. Scaling up.

One message to emerge clearly from country feedback is the importance of training in MDSR techniques, tailored to specific roles within the system. The MDSR Working Group is responding by helping countries to introduce MDSR into pre-service training curricula so that nurses, midwives and doctors already know about the concept when they begin their clinical work. To this end it will be working with partners to develop a flexible training package that can be adapted to country priorities. The first workshop for pre-service integration of MDSR was hosted in Johannesburg in May 2016 by WHO and UNFPA.

As countries strengthen MDSR, and establish the essential elements in good working order, they will wish to extend the scope and quality of their systems so that stillbirths, neonatal deaths and near-miss cases may be considered. In future, training will be more focused at country level.



Recommendations

The MDSR technical guidance describes all the measures required to establish an effective MDSR system. With these in mind, and in light of the findings of the MDSR baseline survey and case studies, the following recommendations are made:

Encourage political buy-in to MDSR

- Advocate at the highest possible political level for support and resources;
- Target policy-makers and decision-makers at all levels by publicizing MDSR findings and recommendations;
- Require the national health minister to “own” a country MDSR report, which should be published annually in his or her name. Do the same with a regional annual report in the name of the regional health minister.

Encourage buy-in by health professionals

- Communicate the objectives and methods of MDSR through targeted training and communications;
- Ensure that the findings of MDRs and recommendations for follow-up action are fed back to front-line staff;
- Emphasize the benefits and dispel fears of a blame culture. MDSR requires an enabling environment – one of collaboration rather than blame.

Create a strong legal and administrative framework for MDSR

- Make maternal death a notifiable event in all countries;
- Work towards universal coverage for notification and review of all maternal deaths;
- Strengthen capacity for collection and analysis of data and consider innovative approaches and technologies that could improve efficiency and coverage, including the use of electronic and internet-based systems;
- Protect health professionals from recriminations and reprisals by assuring legal protection and the principles of anonymity and confidentiality.

Ensure the national MDR committee meets at least biannually

- Institute a schedule of regular meetings;
- Fulfil all the functions set out in the technical guidance, including production of an annual report.

Strengthen processes for notification of suspected maternal deaths

- Develop all channels through which notification may occur, including community groups and civil society organizations;
- Ensure zero reporting occurs.

Investigate all notified suspected maternal deaths

- Set up subnational MDR committees in all lower administrative units of the health sector in each country;
- Consider the death of any women of reproductive age (15–49 years) to be a suspected maternal death until proven otherwise;
- Review all probable maternal deaths through facility and district MDR committees, including those that have occurred in the community;
- Take full account of non-medical factors, such as social determinants or lack of emergency transport to a health facility;
- Encourage the participation of representatives from community-based organizations in MDR committees at both subnational and national level.

Apply an appropriate level of urgency to MDSR

- Conduct all aspects of MDSR in an efficient and timely manner, because other lives will depend on the outcome of MDRs and the implementation of subsequent recommendations;
- Ensure that recommendations are formulated and communicated to the appropriate level of the health system as soon as possible;
- Nominate a member of each MDR committee, at national and subnational level, to follow up and report on the implementation of committee recommendations during the past year.

Complete the loop

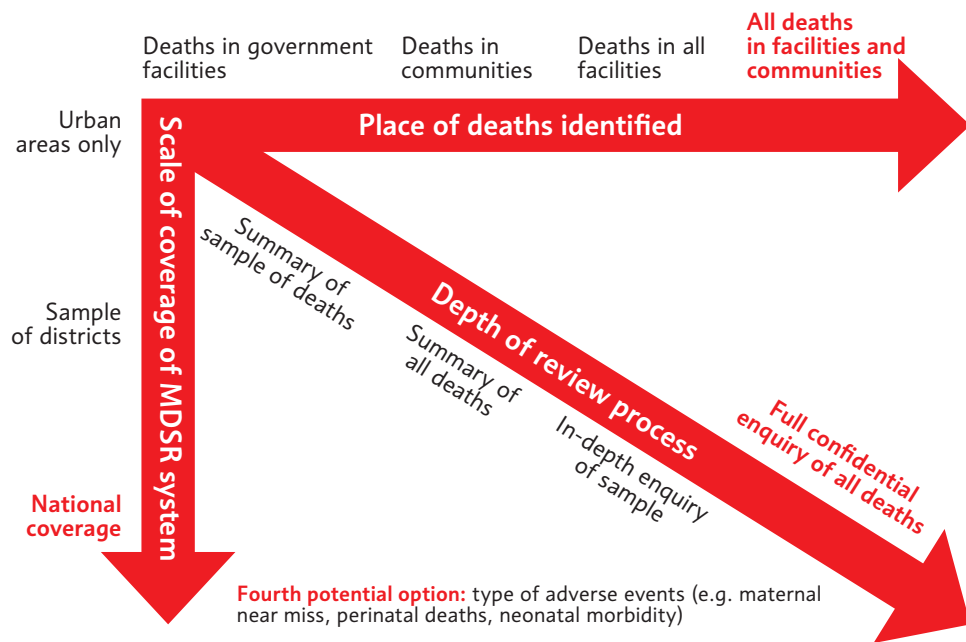
- Ensure every element of the system functions properly to “complete the loop” of identification, notification, review, analysis and response (see **Figure 1**);
- Pay particular attention to the response element; as well as saving lives, this will encourage growth in the other parts of the cycle as people observe the benefits of MDSR.

Think big, but start small and grow steadily

- Develop national plans for a comprehensive MDSR system, but be aware that growth in the system is unlikely to be linear and may not occur rapidly. The starting point will vary from country to country, processes will vary and elements of the system will be introduced at different times and develop at different rates. The rate of implementation may be limited by lack of resources and other factors;
- Begin with projects in specific localities or facilities, which can be scaled up and replicated elsewhere when they prove successful;
- Develop the depth and scope of the review process over time (**Figure 10**).



Figure 10. Think big, but start small and grow steadily



Source: WHO.

Conclusion and next steps

This report summarizes what MDSR is, why it is important and the state of implementation at the time of the MDSR baseline survey. The findings demonstrate that MDSR is now established globally. However, they also indicate that some countries are encountering significant obstacles in their efforts to introduce the system or to make it function correctly. Many of these challenges are specific to the unique resource environment and context of each country and must be resolved at country or subregional level. The MDSR Working Group can do much, with partners, to provide targeted support for countries, and this will be an important focus of its future work.

MDSR is now firmly embedded in World Health Organization policy and activity. It is integral to the WHO Quality of Care initiative and to the new Global Strategy for Women's, Children's and Adolescents' Health, and is also part of the Ending Preventable Maternal Mortality (EPMM) and Every Newborn Action Plan (ENAP) initiatives.

The next global MDSR implementation survey is scheduled for 2017 and will be repeated every two years thereafter. If countries continue to strengthen their MDSR systems, and fill the gaps identified in the MDSR baseline survey, there is good reason to be optimistic that future surveys will indicate a steady increase in the uptake of MDSR and the quality of its implementation. This can only assist in progress towards the ultimate goal of eliminating preventable maternal mortality.



References

1. SIDA. First published on SIDA Website, 10 October 2014. Accessed online, 3 May 2016.
<http://www.sida.se/English/press/current-topics-archive/2014/the-black-box-of-maternal-mortality/>
2. World Health Organization. Beyond the numbers: reviewing maternal deaths and complications to make pregnancy safer. Geneva, 2004.
3. Danel I, Graham WJ, Boerma T. Maternal death surveillance and response. Bulletin of the World Health Organization, 2011, 9: 779.
4. World Health Organization. Keeping promises, measuring results: Commission on information and accountability for Women's and Children's Health. Geneva, 2011.
5. World Health Organization. Maternal death surveillance and response technical guidance: information for action to prevent maternal death. Geneva, 2013.
6. World Health Organization.
http://www.who.int/maternal_child_adolescent/documents/countries/indicators/dashboards/en/
7. WHO, UNICEF, UNFPA, The World Bank and United Nations Population Division. Trends in Maternal Mortality: 1990 to 2015, Geneva, 2015.
8. Starrs A. Safe motherhood initiative: 20 years and counting. Lancet, vol. 368; 30 September 2006.
9. Rosenfield A, Maine D. Maternal mortality – a neglected tragedy. Where is the M in MCH? Lancet, vol. 326; 13 July 1985.
10. World Health Organization. The World health report: 2005: make every mother and child count. Geneva, 2005.
11. Lancet. Maternal survival series. September 2006.
<http://www.thelancet.com/series/maternal-survival>
12. United Nations. The Global Strategy for Women's and Children's Health. New York, 2010.
13. Every Woman Every Child. Saving lives protecting future: progress report on the Global Strategy for Women's and Children's Health. New York, 2015.
14. Op. cit. Keeping promises, measuring results.
15. Centers for Disease Control and Prevention and the World Health Organization. Measuring and understanding maternal mortality: strategies to achieve data completeness and quality. Meeting final report. Atlanta, USA, 2011.

16. Op. cit. Maternal death surveillance and response technical guidance.
17. 10th International Classification of Diseases (ICD-10).
<http://www.who.int/classifications/icd/en/>
18. Sale L et al. Global causes of maternal death: a WHO systematic analysis. Lancet, vol. 2; June 2014.
<http://www.thelancet.com/journals/langlo/article/PIIS2214-109X%2814%2970227-X/abstract>
19. Subha Sri B and Khanna R. Dead Women Talking: a civil society report on maternal deaths in India. CommonHealth and Jan Swasthya Abhiyan, 2014.
20. Op. cit. Trends in maternal mortality.
21. World Health Organization. Saving mothers' lives infographic. Accessed online, 5 May 2016.
<http://www.who.int/reproductivehealth/publications/monitoring/infographic/en/>
22. United Nations. Sustainable Development Goals.
<http://www.un.org/sustainabledevelopment/health/>
23. World Health Organization. Strategies toward ending preventable maternal mortality (EPMM). Geneva, 2015.
24. Every Woman Every Child. Global Strategy for Women's, Children's and Adolescents' Health. New York, 2015.
25. Op. cit. Maternal death surveillance and response technical guidance.
26. Ibid.
27. Op. cit. Trends in maternal mortality.
28. Amnesty International. Giving life, risking death: maternal mortality in Burkina Faso. London, 2009.
29. Op. cit. Trends in maternal mortality.
30. World Health Organization. Accountability for women's and children's health: 2015 progress report. Geneva, 2015.
31. Ameh C, Smith H and van den Broek N. Establishing cause of maternal death in Malawi via facility-based review and application of the ICD-MM classification. Accessed online, 24 May 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/malawi-study/en/
32. Op. cit. Accountability for women's and children's health: 2015 progress report.
33. Subha Sri B and Khanna R. Health systems' issues identified through social autopsies. Dead Women Talking initiative. Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/india-social-autopsy/en/
34. Friptu V et al. Confidential enquiry into maternal death. first report on confidential enquiry into maternal death in Moldova, 2006–2008. Moldova Ministry of Health, Chisinau, 2010.



35. Segun T, Garba AM and Bandali S. Institutionalising maternal death reviews in Jigawa State, Nigeria – from guidelines to implementation. Evidence for Action-MamaYe. Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/nigeria/en/
36. Ameh C, Smith H and van den Broek N. Maternal death surveillance and response in Kenya. Centre for Maternal and Newborn Health at the Liverpool School of Tropical Medicine. Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/kenya/en/
37. Dy-Recidoro Z. From maternal death reporting and review (MDRR) to maternal death surveillance and response: the Philippines experience. First published in the April 2014 edition of the MDSR Action Network newsletter. Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/philippines/en/
38. Gilmartin C. Eliminating maternal deaths in Burkina Faso: integration of MDSR into existing surveillance system. African Strategies for Health project (implemented by Management Sciences for Health). Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/burkina-faso/en/
39. Evidence for Action. Maternal death as a public health emergency: integrating MDSR into existing surveillance in Ethiopia. First published January 2015. Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/ethiopia/en/
40. Op. cit. From maternal death reporting and review (MDRR) to maternal death surveillance and response.
41. Magoma M, Ferla C and Armstrong C. Strengthening maternal and perinatal deaths surveillance and response in Tanzania. Evidence for Action-MamaYe. Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/tanzania/en/
42. Jeganathan R. Malaysia's experience with maternal deaths. First published in the April 2014. edition of the MDSR Action Network newsletter. Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/malaysia/en/
43. Op. cit. Dead Women Talking: a civil society report.
44. Subha Sri B and Khanna R. Social determinants approach to maternal deaths. Dead Women Talking initiative (adapted from a chapter in a forthcoming volume: Nambiar D, Muralidharan A. [eds.] The Art of the Possible: Understanding and Acting on the Social Determinants of Health in India). Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/india-social-determinants/en/

45. Mahmud R. Social autopsy triggers community response for averting maternal and neonatal death in Bangladesh. Accessed online, 3 May 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/social-autopsy-bangladesh/en/
46. Op. cit. Dead Women Talking: a civil society report.
47. Saving Mothers, Giving Life initiative. Lessons learned from a maternal death surveillance and response system in Uganda. Updated from an article published in the December 2014 edition of the MDSR Action Network newsletter. Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/uganda/en/
48. Evidence for Action. A maternal survival action network for Sierra Leone. Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/sierra-leone/en/
49. Akosah E, Dapaah SO and Kanter AS. Using mobile technology to support vital registration and verbal autopsy in community: Bonsaaso Millennium Villages Project, Ghana. Previously published in the August 2015 edition of the MDSR Action Network newsletter. Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/ghana/en/
50. Op. cit. Institutionalising maternal death reviews in Jigawa State, Nigeria.
51. Op. cit. Dead Women Talking: a civil society report.
52. Op. cit. Health systems' issues identified through social autopsies.
53. Op. cit. Dead Women Talking: a civil society report.
54. Wallace R, Sharkey H and Simpson F. Maternal death review and maternal death surveillance and response: characteristics and obstacles to success. Robert Gordon University, Aberdeen, 2016.
55. Op. cit. Maternal death surveillance and response technical guidance.
56. Op. cit. Maternal death review and maternal death surveillance and response: characteristics and obstacles to success.
57. Op. cit. Maternal death surveillance and response in Kenya.
58. Ameh C, Smith H and van den Broek N. Maternal death reviews in Moldova. Centre for Maternal and Newborn Health at the Liverpool School of Tropical Medicine (based on a paper originally published in the BJOG Supplementary, September 2015, by Halim A et al.) Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/moldova/en/
59. Konopka SN. Integrating and strengthening maternal death surveillance and response in Malawi. Accessed online 24 May 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/malawi/en/



60. Op. cit. Malaysia's experience with maternal deaths.
61. Ameh C, Smith H and van den Broek N. Facility-based maternal death reviews in Cameroon. Centre for Maternal and Newborn Health at the Liverpool School of Tropical Medicine (based on a paper originally published in the BJOG Supplementary, September 2014, by De Brouwere V, Delvaux T and Leke RJ). Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/cameroon/en/
62. Op. cit. Malaysia's experience with maternal deaths.
63. Ibid.
64. Ameh C, Smith H and van den Broek N. Facility-based maternal death review in Nigeria. Centre for Maternal and Newborn Health at the Liverpool School of Tropical Medicine (based on a paper originally published in the BJOG Supplementary, September 2014, by Achem FF and Agboghoroma CO). Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/nigeria-study/en/
65. Op. cit. Beyond the numbers.
66. Op. cit. Social determinants approach to maternal deaths.
67. Op. cit. Malaysia's experience with maternal deaths.
68. Op. cit. Facility-based maternal death review in Nigeria.
69. Op. cit. Integrating and strengthening maternal death surveillance and response in Malawi.
70. Op. cit. Health systems' issues identified through social autopsies.
71. Op. cit. Eliminating maternal deaths in Burkina Faso.
72. Biswas A. Maternal and perinatal death review (MPDR): experiences in Bangladesh. Accessed online, 29 April 2016.
http://www.who.int/maternal_child_adolescent/epidemiology/maternal-death-surveillance/case-studies/bangladesh-study/en/
73. Op. cit. Establishing cause of maternal death in Malawi via facility-based review.

ANNEX

The MDSR baseline survey questionnaire

Page numbers quoted refer to the MDSR technical guidance document.

SRL. NO.	INDICATOR ON MDSR	EXPLANATORY NOTES
Policy indicators		
1	Has a national MDSR plan been developed?	A nationwide policy or plan for implementation of MDSR should be produced outlining how the MoH foresees MDSR being implemented and showing relevant linkages and networks.
2	If YES, what year was the plan adopted?	State the year the plan/policy was adopted.
3	Does national policy require all maternal deaths to be reviewed?	A nationwide policy or plan for all maternal deaths to be reviewed.
4	If YES, what year was the policy adopted?	State the year the policy was adopted.
5	If your country is implementing MDSR, since when has it been in implementation (year)?	State the year MDSR started to be implemented, irrespective of implementation at national or subnational level.
6	Is MDSR implemented nationally or subnationally?	If subnational MDSR implementation, please state the number of lowest administrative units implementing MDSR.
7	If MDSR is implemented at subnational level, in how many of the lowest administrative units is MDSR implemented?	Number of lowest administrative units where MDSR is implemented.
8	Which agencies are involved in MDSR advocacy (at national and lowest administrative unit level)?	Identify the international agencies or lead agency currently engaged in promoting the implementation of MDSR in your country across the two levels. (Please list all the agencies).
9	Which agencies are involved in providing technical support for MDSR implementation?	Identify the international agencies or lead agency currently engaged in developing technical guidance and implementation plans for MDSR in your country across the two levels. (e.g. WHO/UNFPA/UNICEF/USAID, NGO etc. Please list all the agencies).
10	Which agencies are involved in providing training support on MDSR?	Please list all agencies.



SRL. NO.	INDICATOR ON MDSR	EXPLANATORY NOTES
11	If possible, could you provide information on which organizations are involved in MDSR implementation at the lowest administrative unit?	To be able to map the MDSR implementation support at the lowest administrative level to map the different initiatives nationally.
12	Which agencies are involved in funding MDSR efforts in your country?	Identify which international agencies or lead agency is providing financial support for MDSR implementation projects in your country across the two levels. (Please list all the agencies).
13	Have civil society organizations (CSOs) been involved in the development of implementation plans?	Highlight if CSOs have been involved in the development of implementation plans for MDSR in your country across the two levels. Please answer for both national level and for lowest administrative units.
14	Is maternal death a notifiable event?	Has the government implemented a policy to add maternal deaths as a notifiable event? Most countries have an existing structure for notifiable conditions; we would like to assess if maternal death has been included. For some countries this may mean that maternal mortality is included in their integrated deaths surveillance and response (IDSR) (p14).
15	If YES, what year was the policy adopted?	State the year the policy was adopted.
16	Does the system require zero reporting?	Zero reporting means there is an active process of notifying suspected maternal deaths, whether or not any occurred. If no maternal deaths occurred, a "zero" is captured in the data collection system (p14).
17	How are maternal deaths reported?	Some countries report maternal deaths through the routine reporting system and in some countries maternal death notification, reporting, and response are included in other surveillance systems (e.g. integrated disease surveillance and response). Other countries have maternal deaths reported in a parallel individual system, for example through a hotline.
18	National maternal death review committee or equivalent exists?	In some countries, national committees may replace existing maternal death review committees at the ministry of health level.
19	How often does the national maternal death review committee meet?	Initial recommendations are that the national committee meet every six months minimum.
20	Does the national maternal death review committee discuss maternal death cases?	A maternal death case refers to the specific patient case and related maternal death review conducted at the lowest administrative unit.

SRL. NO.	INDICATOR ON MDSR	EXPLANATORY NOTES
21	If so, does it discuss all cases or a proportion of cases (specify proportion)?	Please specify what proportion in percentage or write not applicable if answer to question is NO.
22	Are family members and the community invited to participate in review meetings?	Important to identify factors in the family or in the community that might have contributed to the maternal death. Does the policy or plan state that family and community should be involved?
23	Is there a mechanism in place for monitoring and evaluation? If YES, please describe the M&E mechanism for MDSR.	Describe the countrywide mechanism for monitoring and evaluating the entire MDSR system. (Please write a short list with the necessary details).

Identification and notification

24	What is the proportion of lowest administrative units that are reporting maternal deaths?	Please state the number of lowest administrative units in the country notifying maternal deaths divided by the total number of lowest administrative units in the country.
25	From those lowest administrative units reporting maternal deaths, how many are conducting maternal death reviews?	
26	Total number of maternal deaths notified, during the last calendar year (please state the period).	The total number of maternal deaths that have been notified to the national committee. (Please report the number and its reference/reporting period).
27	Frequency in which the lowest administrative units report maternal deaths to the national committee.	Initial recommendations are a minimum of quarterly reports.
28	Number of facility based maternal deaths notified, during the last calendar year (please state the period).	Facility refers to the first and referral level facility.
29	Number of maternal deaths in facilities notified within 24 hours within the past calendar year.	The target for maternal death reporting from facilities is 24 hours as outlined in the technical guidance (p11).
30	Number of maternal deaths in the community notified, during the past calendar year (please state the period).	Community deaths are considered all deaths outside of health facilities regardless of whether a woman has accessed health services in the past.
31	Number of maternal deaths in the community notified within 48 hours during the past calendar year.	The target for maternal death reporting from the community is 48 hours as outlined in the technical guidance (p11).
32	Number of live births reported at each lowest administrative level during the last calendar year.	State the number of live births at each lowest administrative level during the past calendar year (please state the year).



SRL. NO.	INDICATOR ON MDSR	EXPLANATORY NOTES
Review		
33	What is the lowest administrative unit in which the review committee exists (i.e. district, province, region, county etc.)?	Review committees may exist across all levels of government structure – we would like to define the lowest administrative unit that the committees exist.
34	How many of lowest administrative units exist in the country?	As this is subject to change, this information will be collected annually.
35	How many lowest administrative units have maternal death review committees?	The total number of lowest administrative units who have established a review committee across the country.
36	How many of the review committees are functional?	There might be a review committee in place but it may not be functioning properly.
37	How frequently does the lowest administrative unit review committee meet?	Initial recommendations for a lowest administrative unit committee meeting is a minimum of quarterly.
38	Is there a special designated officer? And if so, who is it?	The designation of the individual responsible for MDSR at lowest administrative level (please state the position).
39	Does the committee include representation from: <ul style="list-style-type: none"> • Administrative officials • Technical staff • Community representation 	<ul style="list-style-type: none"> • Administrative officials include MoH representatives, medical officers, secretaries etc. • Technical staff including nurses, doctors and midwives etc. • Community representation includes civil society groups, community spokespeople etc.
40	Total number of maternal deaths reviewed at the lowest administrative unit review committee during the past calendar year.	The combined number for all maternal death reviews across all lowest administrative units is required during the past calendar year (per lowest administrative unit).
41	Total number of verbal autopsies conducted for suspected maternal deaths during past calendar year.	<p>A suspected maternal death is defined here as the death of any woman while pregnant or within 42 days of the termination of pregnancy, clearly not due to incidental or accidental causes.</p> <p>As it may be difficult to diagnose pregnancy early on the 42 days should be extended to 2–3 months after pregnancy when setting up the system for notification of suspected maternal deaths (p14).</p> <p>The combined number for all verbal autopsies across all lowest administrative units is required.</p>

SRL. NO.	INDICATOR ON MDSR	EXPLANATORY NOTES
Response		
42	Describe the mechanisms/pathways in which information and recommendations from the national committee are disseminated to the lowest administrative unit, then the facility level and finally to the community level.	Qualitative information is required to establish how information is transferred from the review committee meetings up to the national level and how it is disseminated and how the feedback is being provided to the regions and localities. Please comment on how recommendations are prioritized and whether deadlines for implementation are included.
43	Describe the monitoring systems in place to follow up and check whether recommendations are actually met.	Qualitative information is required to understand how the review committee checks whether disseminated recommendations have been acted on.
Reporting		
44	National committee produces an annual report and recommendations.	As outlined in the technical guidance a national level annual report of MDSR findings should be produced (p50).
45	Subnational review committee produces an annual report and recommendations	A district level report with the MDSR findings and recommendations may be distributed to decision-makers, community leaders, etc.
46	How are these reports made available to stakeholders?	The technical framework gives examples of how the annual report should be disseminated at a subnational/national level as well as how it should be shared with the community and facilities (p53).



For further information please contact:

**Department of Maternal, Newborn, Child and Adolescent Health
World Health Organization
20 Avenue Appia
1211 Geneva 27
Switzerland**

Tel: +41 22 791 32 81

Fax: +41 22 791 48 53

E-mail: mncah@who.int

Website: http://www.who.int/maternal_child_adolescent/en/

**Department of Reproductive Health and Research
World Health Organization
20 Avenue Appia
1211 Geneva 27
Switzerland**

Fax: +41 22 791 41 71

E-mail: reproductivehealth@who.int

Website: www.who.int/reproductivehealth



**World Health
Organization**

ISBN 978 92 4 151123 0



9 789241 511230