**Maternal Death Surveillance and Response Systems in driving accountability and influencing change**

**Background**

Globally, there has been a 44% reduction in maternal deaths and a drop in the annual number of maternal deaths from 532,000 in 1990 to 303,000 in 2015.1 Despite notable progress, there is still wide disparity with low and middle income countries making up 99% of the global maternal deaths.2 More than 80% of maternal deaths are avoidable even in resource constrained countries and often minimal changes can improve maternal survival.3 To achieve the target of decreasing the maternal mortality ratio to less than 70 per 100,000 live births under the Sustainable Development Goals (SDGs), renewed focus and accountability towards ending preventable maternal deaths is needed.

The Commission on Information and Accountability (CoiA) in 2011 and the recent Global Strategy for Women’s, Children’s and Adolescents’ Health (2016-2030) recommend accountability as a core principle to drive progress for health outcomes.4, 5 A continuous monitor-review-act cycle is recommended which includes national oversight, monitoring of results, multi-stakeholder reviews and action – all ingredients of surveillance and response systems .6, 7

In response to CoIA recommendations, the World Health Organization (WHO) released a Maternal Death Surveillance and Response (MDSR) technical guidance document in 2013 which builds on the continuous learning and action cycle under CoiA to bolster accountability for maternal health outcomes. MDSRs are a comprehensive system building on facility based maternal death reviews being implemented in many countries, but focuses more explicitly on notification of maternal death, findings being acted upon and accountability for responses undertaken.7-9 It also provides opportunities to ensure learning from maternal deaths influences more systemic responses to quality of care improvements from local to national levels .9

Established MDSR systems can contribute to improved maternal mortality measurement by counting all maternal deaths, location of death, causes of death and linking it to routine health information systems responses.1, 7, 10-13 Findings from MDSRs can provide powerful evidence to influence actions and advocacy among those in the health sector, policy and decision-makers, non-governmental organizations and communities among others.3 Every maternal death has a story to tell and provides insightful information to unlocking barriers to improve services11, 14, but these findings must be acted upon for real change to occur at policy, programme and facility levels as demonstrated in South Africa, Egypt, Mali, Senegal and South-East Asia. 3, 8, 10, 12, 15, 16

Since the launch of the technical guidance on MDSRs, a number of countries have been working towards implementing comprehensive MDSRs systems by building on their existing approaches including MDRs, confidential enquiries and verbal autopsies to count, review, act, account for and reduce preventable maternal deaths. In 2015, the WHO undertook a survey to assess the implementation status of MDSRs across low and middle-income countries and identify where further efforts could strengthen the transition into comprehensive MDSR system. This paper analyses key findings from the WHO Global MDSR report and provides two concrete examples from Nigeria and Ethiopia where MDSR has influenced systematic changes in policy or practice.

**Nigeria: Accountability influencing local action and strategic decisions**

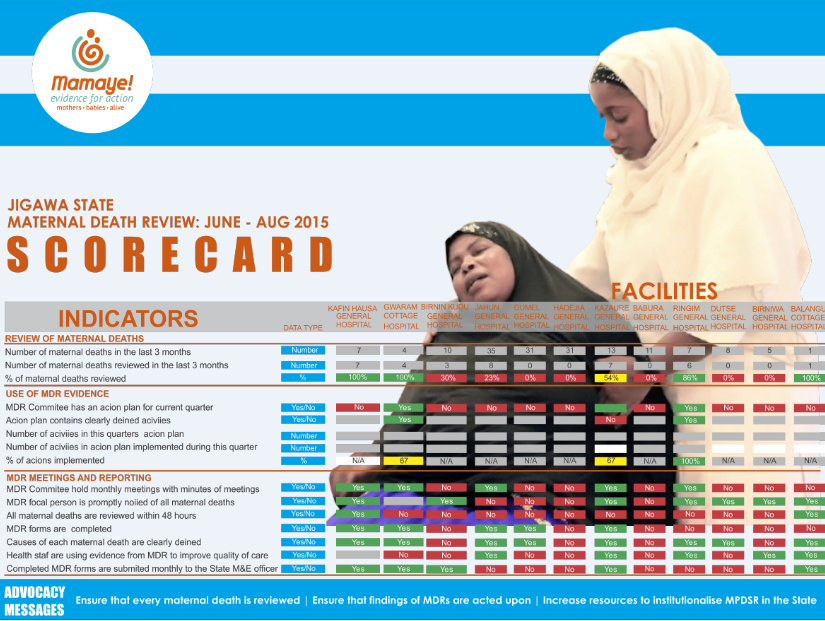
Nigeria contributes to 19% of the total maternal deaths globally,1 yet has used findings from maternal death reviews and accountability for maternal deaths at sub-national level to drive systemic health sector changes at local and policy levels.

Evidence for Action (E4A) has worked with state health officials to introduce scorecards in Northern Nigeria which track the implementation status of MDRs across all secondary facilities in each state. Nigeria is one of the first countries to adapt the global WHO MDSR survey questions to sub-national level in order to assess the strength of the MDRs. The innovative scorecards (see Figure 1) are a key accountability tool to improve the effectiveness of MDRs as Nigeria transitions into the implementation of an MDSR system resulting in improvements beyond the facility contributing to more systemic change. Data captured in the scorecard include whether all maternal deaths are notified, whether action plans are developed and if recommendations are acted upon.

The scorecards have influenced health practices at local levels but also increased visibility of maternal deaths and responses at higher levels. Findings have inspired local action and responses in Jigawa state. A General Hospital showed haemorrhage as a leading cause of maternal deaths due to insufficient blood supply and non-functional blood banks. In response, service providers sensitized the public to encourage voluntary blood donation which led to the formation of blood donor clubs. The facility now has a directory of blood donors which includes their blood groups and phone numbers so they can be reached any time blood is needed. Moving to policy level influence, the government in Kano state, concerned by the number and causes of maternal deaths, decided for the first time to incorporate MDR findings into State Medium Term Sector Strategy (2016-2018), including:

* Provision and maintenance of functional blood banks in all state hospitals since haemorrhage and anaemia are the leading causes of maternal deaths
* Integrated demand creation activities as low uptake of antenatal care and delivery services are prevalent in Northern Nigeria and often linked to maternal mortality.

Figure 1: Jigawa MDR Scorecard



**Ethiopia: National roll-out and focusing on the ‘R’ of the MDSR system**

Ethiopia is one of a few countries implementing a comprehensive MDSR system. It started with strong political commitment and the subsequent roll out of MDSRs across the country with technical support from WHO and E4A. Dedicated investment has resulted in MDSR training programmes implemented in seven of the nine regions, all working towards full notification, reporting and response.17 There is already emerging evidence in Ethiopia of systemic quality of care improvements at multiple levels as a result of MDSR findings.

As of 2014, all maternal deaths are now notifiable under Ethiopia’s Public Health Emergency Management system, equivalent to an integrated surveillance and response system in other countries, thus activating the surveillance part of the MDSR cycle. With nearly 80% of maternal deaths occurring in communities, verbal autopsies are an important approach of Ethiopia’s MDSR system alongside facility MDRs.

With the expansion of the MDSR system in Ethiopia, many examples of responses are emerging from facility level to more widespread changes in health system. In a referral hospital in Amhara Region where monthly reviews of maternal death take place, response to findings included the creation of an additional operating space with appropriate anaesthetic support to reduce waiting times for emergency procedures and improved feedback and training on the management of haemorrhage and eclampsia. Findings however have also influenced more widespread changes across facilities and within the region. There is improved communication within the hospital and between different professional groups including midwives, anaesthetists, obstetricians, managers and laboratory staff. At regional level, findings have informed planning at Regional Bureau level and feedback is regularly communicated on bottlenecks to referring district hospital, health centres and communities.

**Analysis of key findings from the MDSR Implementation Survey**

The examples from Nigeria and Ethiopia provide contextual insights into how MDSR influences accountability, actions and responses at multiple levels. We now turn to the implementation status of MDSRs across 62 countries based on data gathered from WHO/UNFPA Global MDSR Implementation Survey completed in 2015.[[1]](#footnote-1) Summary statistics provide a status update on MDSR implementation. We conducted a thematic analysis of open responses, developing a coding scheme inductively with a view to benchmarking countries against recommendations in the WHO MDSR Technical Guidance8 where possible. For this analysis, countries were stratified according to *Strategies toward Ending Preventable Maternal Mortality* groups13, which are based on maternal mortality ratios in 2010 (MMR): low burden MMR <70 (*n*=13), medium burden MMR <420 (*n*=25), and high burden MMR >420 (*n*=24).

Ideally, it would have been useful to determine coverage of the MDSR system. It is possible to estimate the proportion of maternal deaths captured by each country’s MDSR system using the number of notified deaths stated in the WHO survey (numerator) as a proportion of the UN estimates of the number maternal deaths for the corresponding period (denominator). This would enable an estimate of the coverage of an MDSR system and allow cross-country comparisons, however this analysis would not have given accurate or meaningful results as the numerator is not reliable and the denominator has wide confidence intervals. Furthermore, while the UN estimates have been adjusted to account for data based on pregnancy related deaths rather than maternal deaths, it is unclear whether the numerator differentiates pregnancy related and maternal deaths. Bearing in mind these caveats, it would be possible to estimate coverage this way if the numerator were reliable and conducting a sensitivity analysis using the denominators’ upper and lower confidence interval limits. As a result of the data challenges we have not included an analysis of MDSR coverage in this paper though efforts to improve reliability and quality of this data should be prioritised.

Figure 2 provides an overview of MDSR implementation including notification, reviews, reporting and stakeholder involvement. It shows that more countries are achieving early phases of the MDSR action cycle of having a notification and policy in place, though fewer countries achieve best practice in the later stages of the cycle such as having review committees and reports with recommendations at different levels. Fewer still disseminate findings and involve stakeholders beyond the health system. There still remains a gap between policies to full implementation of MDSRs across countries.

Figure 2: MDSR implementation progress (n=62)

The WHO MDSR Technical Guidance highlights that regular and transparent dissemination of results is crucial for ensuring government accountability for improving maternal health. It suggests multiple stakeholders to consider when disseminating findings which include at the community, facility, sub-national, and national level. Of 62 countries only 26 made annual MDSR reports available (Figure 3). This was least common in high burden countries.[[2]](#footnote-2)

Figure 3: Report availability to stakeholders (n=62)

Laos, Malaysia, Maldives, Sri Lanka, and Senegal (all high burden countries except Senegal a medium burden country) follow good practice in disseminating information to a range of stakeholders using multiple channels. For example, Sri Lanka shares minutes of annual report review meetings and Senegal disseminates reports to communities as well as within the health system.

The WHO MDSR Technical Guidance recommends that information and recommendations are “disseminated using a variety of channels to enable a wide range of people to access it and ensure that the information gets to those who can act on it”.8 Low and medium burden countries are conducting more dissemination than high burden countries (Table 1). Little dissemination to facility or community level exists, contrary to WHO recommendations to always feedback to communities and hospitals that provided data.

Table 1: Dissemination of information and recommendations (n=62)

|  |  |  |  |
| --- | --- | --- | --- |
|  | low burden (n=13) | medium burden (n=25) | high burden (n=24) |
| No data | 3 | 2 | 2 |
| No national level committee | 1 | 2 | 9 |
| No dissemination | 0 | 2 | 4 |
| National level | 6 | 10 | 5 |
| Lowest administrative unit | 6 | 9 | 8 |
| Facility | 6 | 4 | 4 |
| Community | 1 | 3 | 2 |

Columns do not add up to total in each group as some countries fall into multiple categories

Only Malaysia produces an annual report and disseminates recommendations at all levels. Malaysia and Sri Lanka were the only countries where MDSR recommendations include timelines, considered good practice in WHO Guidance.8 In Malaysia, recommendations are prioritised taking into account the scale, resources required for and feasibility of implementation.

Monitoring systems are important for determining if and how MDSR findings and recommendations have been implemented and elements of accountability to track actions and outcomes.8 However, less than half of countries assessed have a monitoring system in place (Figure 4).

Figure 4: Recommendation monitoring systems (n=62)

**Conclusion**

Countries with higher numbers of maternal deaths face a greater challenge in setting up a system that captures all maternal deaths. Counting every single death is not essential to learn from and take action to prevent further deaths. Counting all deaths may be a retrograde step if it as the expense of resources needed to implement recommendations. What is crucial is that the system should be set up in a way that ensures all maternal deaths, or a representative sample of maternal deaths, are reviewed in a way that promotes system-wide learning and stimulates responses.

The WHO MDSR Technical Guidance is relatively new and countries have made early progress in implementing recommended policies. A majority of countries have policies in place for maternal death notification and review yet a gap remains when examining the steps beyond this including reviewing and reporting at an aggregate level, disseminating findings and recommendations, and involving civil society and communities. As compared to low and medium burden countries, fewer high burden countries are making reports available to stakeholders, disseminating at multiple levels, and have monitoring systems in place to track recommendations.

As MDSR uptake increases globally, a number of factors should be considered to ensure effectiveness and sustainability including: 1) a supportive institutional culture at all levels fostering a learning rather than a punitive environment;18 2) multidisciplinary teams which review and communicate findings at different levels of the health system 11 and to those in a position to act on the evidence; 2) leadership and commitment of government and health care staff to the system;10 3) 4) aggregating data from facility and community level to higher levels to gain deeper insight into quality of care gaps and address wider systemic barriers;18 and 5) recognition that local and less resource intense solutions can save lives.18

As countries implement MDSR in line with accountability goals, they can access information, resources and case studies from the MDSR Action Network (<http://mdsr-action.net/>) convened by E4A on behalf of the WHO MDSR Technical Working Group. The Network connects stakeholders, inspires people to make a change and learn from what other countries are doing to implement effective MDSR systems. Wider scale-up of MDSRs can help achieve SDG goals in ending preventable maternal mortality and improving quality of both maternal and newborn care.7, 13

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2. Low burden: Iran, Iraq, Lebanon, Malaysia, Maldives, Sri Lanka; Medium burden: Bangladesh, Botswana, Burkina Faso, Indonesia, Kiribati, Laos, Myanmar, Rwanda, Senegal, Sudan, Togo, Uganda, Zambia; High burden: Cameroon, Congo, Eritrea, Gambia, Mali, Niger, Nigeria, Swaziland [↑](#footnote-ref-2)