



Opening the Black Box of Maternal and Newborn Deaths in Kenya

A Report on Technical Support for Implementation of Maternal and Perinatal Death Surveillance and Response

September 2017



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This publication has been supported by the United States Agency for International Development (USAID) under the terms of MEASURE Evaluation PIMA associate award AID-623-LA-12-00001. MEASURE Evaluation PIMA is implemented by the Carolina Population Center at the University of North Carolina at Chapel Hill, in partnership with ICF International; Management Sciences for Health; Palladium; and Tulane University. Views expressed are not necessarily those of PEPFAR, USAID, or the United States government.

TR-17-213



ACKNOWLEDGEMENTS

We acknowledge the United States Agency for International Development (USAID)/Kenya and East Africa for the technical and financial support they provided for this report.

This report was prepared by Benter Owino and Susan Kinyua, of the USAID-funded MEASURE Evaluation PIMA, and Elizabeth Mgamb and Violet Adeke, of the Reproductive and Maternal Health Services Unit (RMHSU) of the Kenya Ministry of Health.

We acknowledge the following people and institutions for their contributions to the process leading to preparation of this report: Dr. Joel Gondi, head of the RMHSU, and his colleague Joyce Onyango. Dr. Judy Omumbo and Dr. Amin Abdinasir, of MEASURE Evaluation PIMA, provided additional input. We thank the county health management teams, directors for health, reproductive health coordinators, and health records officers in Kilifi, Kisumu, Migori, Muranga, and Nairobi counties.

We thank Allison Schmale, Cindy Young-Turner, MEASURE Evaluation, ICF, and Yvonne Otieno, of MEASURE Evaluation PIMA, for editorial support. And we thank the knowledge management team of MEASURE Evaluation, University of North Carolina at Chapel Hill, for editorial and production services.

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ABBREVIATIONS

EmONC	emergency obstetrical and newborn care
LSTM	London School of Tropical Medicine
MEval-PIMA	MEASURE Evaluation PIMA
MOH	ministry of health
MPDSR	maternal and perinatal death surveillance and response
NCAPD	National Coordinating Agency for Population and Development
RMHSU	Reproductive and Maternal Health Services Unit
USAID	United States Agency for International Development
WHO	World Health Organization

CONTEXT

Kenya aims to reduce its high maternal mortality rate from 362 deaths per 100,000 live births (Kenya National Bureau of Statistics, Ministry of Health/Kenya, National AIDS Control Council/Kenya, Kenya Medical Research Institute, and National Council for Population and Development/Kenya, 2015) to 200 deaths per 100,000 live births by 2030. Maternal and perinatal death surveillance and response (MPDSR) is an essential, high-impact element of obstetric and newborn care and a game-changing approach to attaining this goal. In 2008, the Kenya Ministry of Health (MOH) adopted the World Health Organization’s technical guidelines on maternal death reviews (World Health Organization [WHO], 2004) and incorporated a perinatal component. A 2014 audit of the implementation of maternal death reviews showed weaknesses, such as a lack of knowledge of classification of causes of death in accord with the International Classification of Diseases (WHO, 2010), low levels of reporting of maternal deaths, and a lack of reporting forms. These issues show that health workers in maternal and neonatal health programs face challenges in providing specific services to eliminate the deaths of women and newborns. WHO has described these kinds of data gaps—in Kenya and elsewhere—as the “black box of maternal mortality” (Sida, 2014). The missing data are necessary for Kenya to track preventable maternal and newborn deaths precisely and in real time and to respond effectively.

What Is MPDSR?

MPDSR is a form of continuous surveillance linking the health information system and quality improvement processes from local to national levels. It includes the routine identification, notification, quantification, and determination of causes and avoidability of all maternal and perinatal deaths, as well as the use of this information to respond with actions that will prevent future deaths. MPDSR will enable the MOH to identify geographic variations in the burden and specific causes of maternal and perinatal deaths so that resources can be allocated where they are needed most and policy changes can be instituted to ensure political buy-in, adequate legal frameworks, and a no-blame environment. Kenya adopted WHO’s definition of maternal death: *Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy (irrespective of duration and site of pregnancy) from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes; and perinatal deaths (stillbirths and early neonatal deaths)* (WHO, 2004).



The overarching objectives of MPDSR are as follows:

- Document the burden of maternal and perinatal deaths.
- Gain an understanding of health system failures that lead to maternal and perinatal deaths.
- Raise awareness of avoidable factors related to maternal and perinatal deaths in facilities and communities.
- Stimulate action to address avoidable factors, thereby preventing future maternal and perinatal deaths.

The Need for MPDSR in Kenya

Data show that maternal deaths in Kenya are predominantly because of hemorrhage, severe preeclampsia/eclampsia, sepsis, obstructed labor, and unsafe abortion. Perinatal deaths are mainly caused by preterm birth, infections, and birth asphyxia, such as obstructed labor and uterine rupture (United Nations Children’s Fund, 2012). Recent estimates show that annually in Kenya, approximately 7,700 mothers die during pregnancy, delivery, or shortly thereafter; 40,000 babies die during the first 28 days of life; and 23,000 stillbirths occur. According to the 2010 Kenya Service Provision Assessment, only 30 percent of the health facilities surveyed could provide basic emergency obstetrical and newborn care (National Coordinating Agency for Population and Development (NCAPD), et al., 2011); only 15 percent of maternal deaths were recorded in Kenya’s health information system (DHIS 2); and only 60 percent of all maternal and perinatal deaths were captured by the civil registration system because of data gaps in DHIS 2.

THE INITIATIVE TO STRENGTHEN MPDSR IN KENYA

In 2014, the Kenya MOH, through the Reproductive and Maternal Health Services Unit (RMHSU), adopted strategies to improve the statistics related to maternal and perinatal deaths. Key strategies were the scale-up of emergency obstetrical and newborn care (EmONC) and the institutionalization of an MPDSR system to improve reporting and review of deaths at community and health facility levels, with the aim of identifying causes of death and determining appropriate interventions to prevent them.

Audit of the MPDSR Implementation

Kenya developed its guidelines on maternal death reviews in 2004 and revised them in 2009. The MOH subsequently issued a public gazette notice on maternal death as a notifiable event to ensure completeness, timeliness, and good quality in data transmission. In 2013, a review of the data and status of the reviews indicated poor use of data collection tools, even though health workers had been trained on them.

In 2014, RMHSU, working the Civil Registration Department, commissioned the national MDSR working group to audit the status of the MPDSR implementation in 15 counties with high maternal mortality. Other partners in the working group were the United Nations Children’s Fund, the London School of Tropical Medicine (LSTM), the African Medical and Research Association, and the U.S. Agency for International Development (USAID). MEASURE Evaluation PIMA (MEval-PIMA), funded by USAID, provided technical assistance with preparation of the research protocol, development of electronic survey tools, enumerator training, data management, analysis, and report writing. This audit aimed to provide information on challenges and gaps and good practices, and to propose improved procedures for maternal and perinatal death audits.

Key findings of the audit related to the surveillance system’s structure and capacity: the absence of reliable routine data on maternal and perinatal mortality dynamics, variable understanding of the terms “maternal” and “perinatal” deaths, and the lack of standard guidelines and tools for reporting to a central information system. In addition, the county and subcounty MPDSR committees were either nonexistent or not fully operational.

The audit recommended the following strategies to strengthen capacity for MPDSR: revising national guidelines, institutionalizing MPDSR national and subnational committees, and improving reporting through standard forms for DHIS 2. Continuous capacity building and mentorship were identified as essential to improve data quality and encourage data use in routine planning and review cycles.

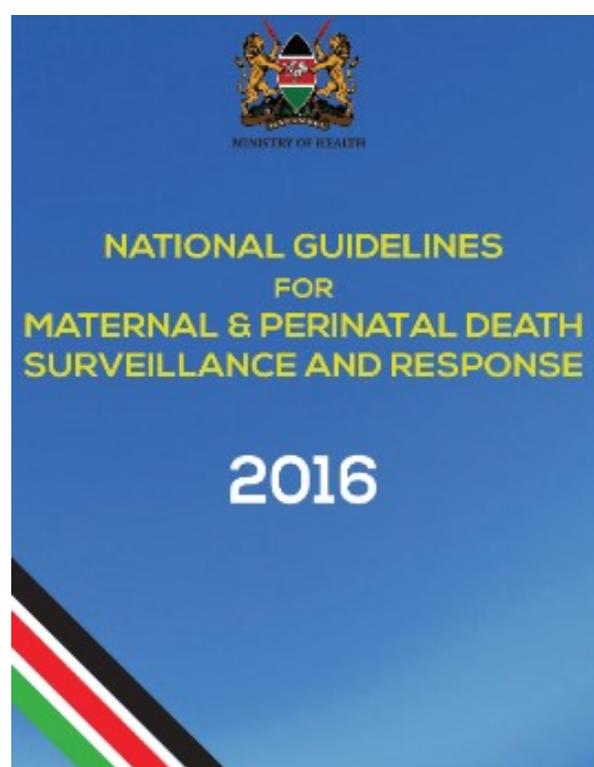
Review of National MPDSR Guidelines

Recommendations from the 2014 audit, along with renewed commitment by the global maternal and newborn health community through the Sustainable Development Goals, the MOH, and the Office of the First Lady's Beyond Zero campaign, provided an additional push for a review of the MDSR guidelines.

Beginning in 2015, MEval-PIMA, as part of the national MPDSR technical working group, supported RMHSU and its partners in revising the MPDSR guidelines and developing tools for implementing the guidelines. The process involved providing technical and financial support to RMHSU to conduct inter-partner coordination meetings, consultations with health and other sectoral stakeholders, a literature review, and writing meetings, as well as to draft and review the guidelines and tools—all leading to a launch of the revised guidance package in April 2016 (Kenya MOH, 2016).

The rationales for the new MPDSR guidelines were as follows (Kenya MOH, 2016):

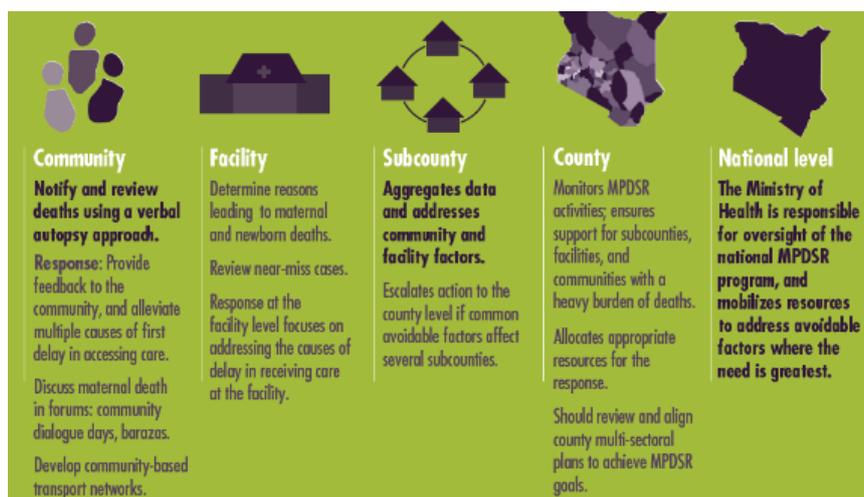
- Maternal and perinatal mortality in Kenya remains high and requires a structured, multisectoral response.
- The guidelines should be congruent with and incorporate the new, devolved structure of governance, following the implementation of the 2010 Kenya Constitution.
- The national maternal and perinatal death and review guidelines needed to be aligned with WHO's MDSR technical guidance (also revised in 2013) (WHO, 2013), by strengthening the response component.
- Kenya's MPDSR guidelines needed to reflect the shift from the Millennium Development Goals to the Sustainable Development Goals.



Support for Scale-Up and Implementation of MPDSR

In response to the revised MPDSR guidelines, Kenya established a five-tier committee structure for the implementation of MPDSR, in which each committee is guided on membership, leadership and roles. The five committees are as follows:

- Community MPDSR Committee
- Facility MPDSR Committee
- Subcounty MPDSR Committee
- County MPDSR Committee
- National MPDSR Committee



The committees would employ the following approaches to MPDSR:

- Community-based maternal and perinatal death reviews
- Facility-based maternal and perinatal death reviews
- Confidential enquiry into maternal death
- Facility-based near-miss reviews

The implementation of MPDSR in the 2016 guidelines is guided by the following principles:

- A no-blame policy must be employed.
- Death reviews focus on health systems, not individuals.
- Maternal and perinatal deaths must be notified within 24 hours, and perinatal deaths must be notified within 48 hours; all deaths must be reviewed within seven days.
- Verbal autopsy form is completed within 30 days of occurrence of a death.
- Weekly reports by Integrated Disease Surveillance and Response must be completed.
- Adoption of zero-reporting principle.
- Maternal and perinatal death review data are anonymized and CANNOT be used for disciplinary or litigation purposes.
- Maternal and perinatal death reviews are considered incomplete without a response.

STRENGTHENING PARTNERSHIPS FOR COORDINATED COUNTY MPDSR ACTIVITIES

In September 2016, RMHSU and the national MPDSR secretariat, with support from the London School of Tropical Medicine (LSTM) and other partners, held a regional assessors' workshop to review sampled case notes of maternal deaths for 2015 and thereby propose strategies to end preventable maternal and perinatal deaths and strengthen central-level coordination of MPDSR in Kenya. A key observation from the workshop was that only a small proportion of maternal and perinatal deaths nationwide were reported to DHIS 2. For example, in 2014 only 946 maternal deaths were reported, and in 2015 only 940 maternal deaths were reported, against an estimated 7,700 maternal deaths that occur annually (Kenya MOH, 2014). This suggested that facilities and subcounty teams needed more support to ensure optimal reporting of maternal and perinatal mortality data to give the country a better perspective on the characteristics of maternal and perinatal death cases. Some of the workshop recommendations included training more healthcare workers on MPDSR, enhancing county health management teams' support for subcounty and facility MPDSR, and implementing mechanisms to compel county teams to release case notes to assessors.

With the national guidelines in hand, the national secretariat in place, and support from implementing partners, RMHSU developed a strategy to support USAID's implementing partners and county health management teams to fully institutionalize MPDSR. MEval-PIMA offered to provide technical and financial support for five focus counties (Kilifi, Kisumu, Migori, Murang'a, and Nairobi) that had also been part of a USAID-funded EmONC scale-up since 2013. The scale-up was in its third year when MPDSR activities were added as a necessary component for a complete package of maternal and newborn care.

MEval-PIMA and RMHSU staff provided training to partner project staff and county focal staff who would ensure that the training would cascade to subcounties and health facilities. MEval-PIMA also assisted county health records information officers with analysis and incorporation of MPDSR indicators during quarterly review meetings and the annual USAID implementing partners' meetings. During these meetings, DHIS 2 data were analyzed and action plans were developed to address any issues arising from the data review. This enabled twinning of MPDSR and EmONC activities, as recommended by WHO guidelines for maternal and newborn care.

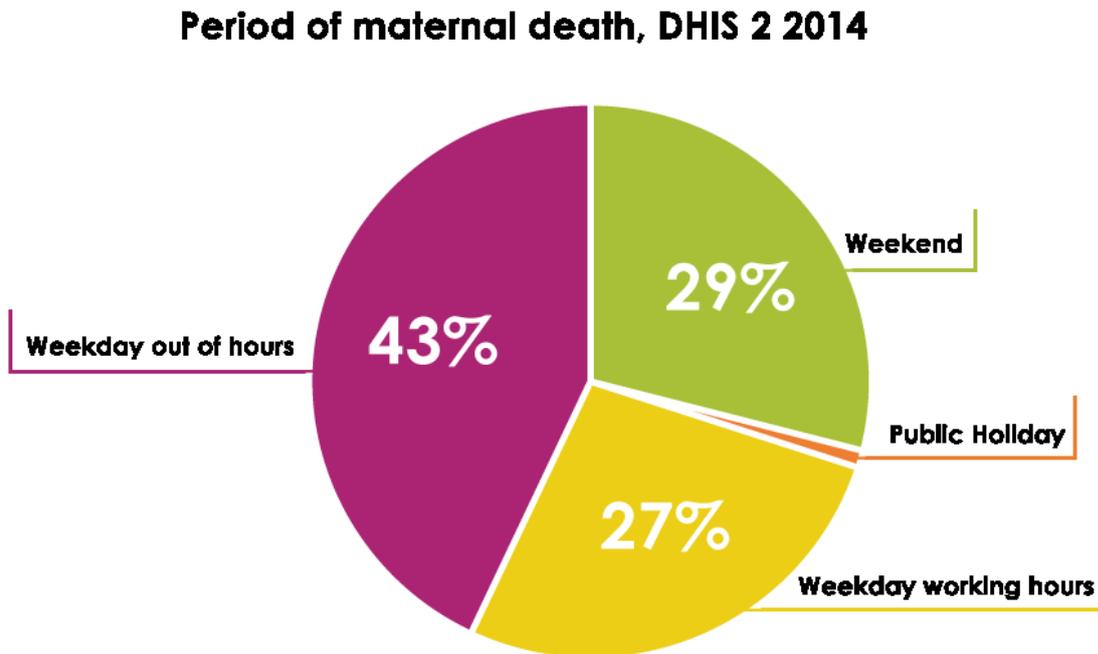
During the USAID implementing partners' annual meeting in 2016, RMHSU presented findings from the first confidential enquiry into maternal deaths using data from the 2014 DHIS 2 reports. One of the key findings was that most maternal and perinatal deaths in facilities occurred outside working hours (see Figure 1), so the enquiry recommended that policies should be reinforced to ensure that maternity services are staffed by competent and experienced care providers 24 hours a day, seven days a week. The enquiry also recommended that counties and health facilities rationalize the number of staff



Photo: Yvonne Otieno, MEASURE Evaluation PIMA

available during working hours and other times. These recommendations have formed part of the indicators in action plans and are reviewed during MPDSR and reproductive health and family planning review meetings held with the focus counties.

Figure 1. Time of maternal deaths at health facilities, Kenya, 2014



NOTES:

Week day working hours: Monday-Friday 8 a.m and 5 p.m.

This data are drawn from the confidential enquiry into maternal deaths by RMHSU, 2014

TIMELY SURVEILLANCE TO PREVENT MOTHERS' AND NEWBORNS' DEATHS

KENYA'S GOAL: Reduce the maternal mortality ratio from 382 deaths per 100,000 live births to 200 per 100,000 by 2010.

EACH YEAR IN KENYA:
 7.7K Mothers die during pregnancy, delivery, or shortly after
 40K Babies die during the first 28 days of life
 33K Stillbirths occur

ONLY 30% of facilities countrywide are ready to provide emergency obstetric and neonatal care.

CALL TO ACTION

- **INVOLVE** families and community MPDSR committees.
- **ENGAGE** in continuous, structured and supervised MPDSR committees at all levels.
- **ENSURE** readiness, motivation and review of all maternal and newborn deaths.
- **ALLOCATE** funds for equipment, supplies and training to improve emergency response as appropriate.

MPDSR IS A CONTINUOUS CYCLE: ALL STAFF SHOULD BE TRAINED TO REPORT AND INVESTIGATE FURTHER DEATHS.

Maternal and newborn health requires an investment in the surveillance system that will be the most effective way to reduce MMR and NMR. MPDSR is a tool for the Ministry of Health to monitor and respond to maternal and newborn deaths, which promotes the identification, investigation, and prevention of maternal deaths.

Using data to save the lives of mothers and newborns

Pregnancy, labor, and delivery present an increased risk of death for women and their newborns.

Mothers and newborns are dying.
 7,700 women die during pregnancy, delivery, or shortly after.
 40,000 babies die during the first 28 days of life.
 33,000 stillbirths occur.

Many maternal and newborn deaths go unreported.
 15% of maternal deaths and 60% of newborn deaths are unreported.

More than 75% of maternal and newborn deaths are preventable.

Maternal and newborn death surveillance and response (MPDSR) is an opportunity to learn in action to improve the lives of women and newborns.

Five Action:

- 1. Identify:** Identify and report all maternal and newborn deaths to the health facility.
- 2. Verify:** Verify the cause of death and the date of death.
- 3. Diagnose:** Diagnose the cause of death and the date of death.
- 4. Classify:** Classify the cause of death and the date of death.
- 5. Report:** Report the cause of death and the date of death to the health facility.

Control and classify every death.

OTHER TECHNICAL SUPPORT FROM MEVAL-PIMA

MEval-PIMA provided the following additional support to the RMHSU and the MPDSR secretariat.

Raising Awareness

MEval-PIMA worked with USAID Kenya/East Africa and implementing partners to increase visibility of MPDSR in the package of maternal and newborn care through technical working groups and other forums.

MEval-PIMA developed MPDSR posters for advocacy and to promote improved reporting and auditing of maternal and perinatal deaths at community, facility, county, and national levels. They were distributed during meetings and to facilities in the five focus counties. The posters answered common questions about MPDSR and offered calls to action at various levels of implementation, including community, facility, subcounty, county, and national levels.

Reviewing and Streamlining Reporting Forms

RMHSU increased efforts to ensure that reporting for maternal and perinatal deaths could be streamlined as soon as possible after launch of the guidelines. MEval-PIMA worked with the MPDSR technical working group, RMHSU, and the national MPDSR secretariat to review existing maternal forms and develop perinatal and other forms for notification, reporting, review, and verbal autopsy. These forms were reviewed by county medical officers, health records information officers, and reproductive health coordinators as well as staff from the Civil Registration Department and MOH Division for Health Informatics and Monitoring and Evaluation. The forms were further refined with input from county review meetings and were eventually developed as online forms for reporting to DHIS 2.

SUCCESSSES, LESSONS LEARNED, AND CHALLENGES

The efforts to strengthen MPDSR as a high-impact initiative toward preventing child and maternal deaths in Kenya has led to the following positive changes to date:

- Greater visibility and buy-in to support MPDSR and goodwill from development partners
- Development and dissemination of national MPDSR guidelines
- Inauguration of the national MPDSR committee and county and subcounty committees
- Development of MPDSR reporting, notification, and review tools, including DHIS 2 versions
- The first report on confidential enquiry into maternal deaths
- Twinning of MPDSR with EmONC activities
- Training of national assessors

Despite these successes, there is still a need for action on the following issues in all five tiers of the MPDSR system in Kenya:

- Feedback between the national and county committees is not yet fully entrenched.
- Challenges remain with the management of case notes, such as the reluctance by county health teams to share the case notes and poor filing systems, which hinder access.
- Staffing capacity gaps remain in RMHSU to meet the national need for MPDSR monitoring and evaluation requirements.

- Despite the guidelines explicitly stating that there will be a no-blame policy in the implementation of MPDSR, some fear of punitive measures in the event of a maternal death remains, and disclosure of accurate information is not fully practiced.
- There is a gap in dedicated communications for community-level awareness and response on the relationships between maternal deaths and the three delays to care: delay in seeking care, delay in reaching a facility, and delay in receiving care within a facility. Cases of women seeking precautionary skilled care when they go into labor for anticipated normal delivery need to be acknowledged and reported, because they are different from cases in which women seek emergency care for a developing complication unrelated to labor that leads to a maternal death (see Case Study 1).

Case Study 1. The Death of Pendo

Pendo, a 35-year-old woman married with six children alive, lived in a village in a county in Kenya with low maternal death rates. This pregnancy, which she did not want, would have been her seventh child. She was brought to the nearby subcounty hospital by her spouse. From the hospital gate, everyone could pick up the strong, foul smell she was emitting. She informed the nurse in charge that she had been experiencing abdominal pain since the morning. On examination, the nurse found an open cervix and broken pieces of black jack weed stalks. Only on further interrogation did she disclose that she had attempted to terminate the pregnancy at a nearby health center, but the treatment did not work. Feeling desperate and frustrated, she sought a neighbor's assistance. The neighbor inserted the black jack weed stalks in her cervix to attempt an abortion. She bled for eight days before she was brought to the health facility in critical condition. She was immediately referred to the nearest hospital for emergency care but died en route in an ambulance. The referring facility obtained feedback from the receiving facility to establish the outcome.

Pendo's case was discussed at the subcounty MPDSR committee review only because it was reported as a maternal death and with full details. The facility and community health workers are now alert to promoting family planning in preventing maternal deaths. They are also improving the referral network so that complex emergency cases such as Pendo's can overcome the three levels of delay to care (delay in seeking care, delay in reaching a facility, and delay in receiving care within a facility).

Source: Subcounty hospital maternal death case notes, 2016. Name is altered for confidentiality.

Case Study 2. Experiences and Adaptations in Implementing MPDSR in Murang'a County

In 2015, MEval-PIMA partnered with the Murang'a County health department to strengthen MPDSR. The partnership entailed support for the county and subcounty MPDSR committees to carry out their mandate as specified in the national guidelines for MPDSR and take action to reduce maternal and perinatal deaths.

Murang'a's maternal mortality rates are low and perinatal death rates are moderate in comparison with those of other counties in Kenya. As such, reviews would be rare owing to the low caseload for maternal deaths. The county adapted the review process to organize quarterly maternal and perinatal death reviews in three clusters of subcounties (see the table). Despite the low maternal death rates, the subcounties have made other notable adaptations, by strengthening near-miss reviews and providing increased coverage of perinatal death reviews to reduce cases of obstetric and newborn emergencies. The subcounty reviews consist of the subcounty MPDSR committee and staff from their linked facilities.

CLUSTER	SUBCOUNTIES	MPDSR REVIEW VENUE
Muranga north	Mathioya, Kangema, Kiharu, Kahuro	Muranga county referral hospital
Muranga south	Kandara, Kigumo, Muranga south	Maragua subcounty hospital
Gatanga	Gatanga	Kiwrara subcounty hospital

This arrangement posed a challenge for collation of data for county reporting on actual numbers and causes of maternal and perinatal death to enable identification of targeted responses. In addition, there were no standard facility reporting tools and there was not a county committee where MPDSR issues could be channeled for resource allocation and high-level discussion.

After the launch of the 2016 MPDSR guidelines, MEval-PIMA, together with USAID AIDS, Population, and Health Integrated Assistance (APHIAplus) Kamili, worked with the county health management team to revive the county MPDSR committee and train subcounty and health facility staff on the revised guidelines and reporting requirements. These were deemed critical to institutionalizing MPDSR and ensuring oversight for actions to eliminate avoidable maternal and perinatal deaths. In keeping with the national guidelines, the county committee was formed and comprises the following county health officials: health director, nursing officer, reproductive health coordinator, health commodities officer, disease surveillance officer, child health focal person, pharmacist, laboratory officer, health administrative officer, community strategy focal person, civil registration officer, and obstetricians and pediatricians from the major hospitals and implementing partners supporting MPDSR in the county.

Through technical assistance from MEval-PIMA and APHIAplus Kamili, the county health management team were oriented on the new MOH notification, reporting, and review forms. The team developed a data summary form used by the subcounty committees. The county's future vision is to develop dashboards to aid in the visualization of causes, trends, and interventions to eliminate maternal and perinatal deaths. The dashboard is envisioned to include correlates such as age, antenatal care, and referral timing, which are important factors for maternal and perinatal deaths.

The county MPDSR committee has made important gains and sustained its operations in a relatively short time owing to factors such as:

- Buy-in and long-term vision to ensure institutionalization of the MPDSR system in the county
- Support for a no-blame policy to ensure full participation and disclosure in the MPDSR process
- Commitment to hold quarterly reviews
- Staff training on guidelines and tools to enhance the quality of reporting and reviews
- Initiatives to sustain the gains made so far, such as:
 - Lobbying for more resource allocation to address avoidable causes
 - Organizing forums to discuss county performance for quality improvement, sensitization, and community awareness

CONCLUSIONS

In Kenya, knowledge of MPDSR as a high-impact intervention has increased, especially among health workers, despite varying degrees of implementation by county MPDSR committees. With global and national commitments to eliminate preventable maternal, child, and newborn deaths, and Kenya's efforts toward these goals, there is promise that the vision for a functional MPDSR system will be achieved. Experience from efforts to institutionalize MPDSR in the five focus counties shows that although reporting is still low, information on the extent and characteristics of maternal and perinatal deaths is becoming more available and accessible. Specific maternal and perinatal mortality data from the “black box” are increasingly accessed, analyzed, and used for policy and service delivery.

MEval-PIMA's experience providing technical support to RMHSU in the implementation of MPDSR in Kenya highlights the importance of a coordinated approach to institutionalizing MPDSR in a country. It also highlights the important role played by a multipartner effort to cascade a national initiative of this kind to subnational actions. Establishing data use as a pillar of MPDSR requires planning and support to ensure that data are of high quality and can be accessed by the various players contributing to the MPDSR cycle and tiers of implementation.

RECOMMENDATIONS

The following recommendations are based on the experiences and lessons learned in the initiative to strengthen MPDSR:

- Obtain political buy-in from the government officials and health professional associations to sustain and expand MPDSR.
- Encourage RMHSU, the Civil Registration Department, and the MOH to work more closely with government officials and health professional associations to ensure that their members take an active role in strengthening MPDSR to increase and sustain national and county health expenditures for MPDSR for maternal and newborn health, including the health information systems that support tracking and evaluation of progress.
- Prioritize access to, quality of, and use of MPDSR data in planning responses.
- Ensure the timeliness, quality, and use of MPDSR data at each point in the cycle through the following:
 - Strengthen mechanisms for real-time notification and review of maternal and perinatal deaths.
 - Promote the flow and use of MPDSR data to close the audit loop to address deficiencies in care. Counties need to ensure that case notes are available for review.
 - Employ more useful analytics for analyzing DHIS 2 data on MPDSR to provide strategic information for different audiences.
 - Triangulate Integrated Disease Surveillance and Response and MPDSR data and strengthen weekly data reporting.
- Continue efforts to create understanding of MPDSR processes and tools among health workers.

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TR-17-213

