The Federal Democratic Republic of Ethiopia
Ministry of Health

PHEM IMPLEMENTATION MANUAL FOR MDSR

FEDERAL MINISTRY OF HEALTH OF ETHIOPIA

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Contents

Foreword

Though progress has been made in the reduction of Maternal Mortality in Ethiopia, Yet there is still high burden of preventable mortality resulting mostly from complications during and following pregnancy and childbirth. To understand how well we are progressing, however, accurate information on how many women died, where they died and why they died is essential, yet currently inadequate. Maternal death surveillance and response (MDSR) is system that measures and tracks all maternal deaths in real time, helps us understand the underlying factors contributing to the deaths, and stimulates and guides actions to prevent future deaths.

Based on the mandate given by the Federal Ministry of Health to prepare and distribute health and health related guideline and standards, this MDSR Implementation manual prepared by Public Health Emergency Management (PHEM) center of Ethiopian Public Health Institute (EPHI) with technical support from stakeholders.

This Implementation manual aims to provide guidance in standardized implementation of maternal death surveillance and response system at national, regional, Woreda and local levels through integrating within the existing PHEM system. Therefore, this integration manual emphasizes the use of the PHEM structure for coordination and collaboration of different actors in the implementation of maternal death surveillance and response in the country.

To develop these implementation manual, technical documents and similar guideline prepared by WHO Africa regions and US-CDC were referenced and contextualized in our setting.

EPHI hopes that this manual meets the needs of public health workers and different partners who are participating in maternal death surveillance and response system.

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Acronyms

EDHS: Ethiopian Demographic Health Survey

EPHI: Ethiopian Public Health Institute

ERT: Emergency Response Team

FBMDA: Facility Based Maternal Death Abstraction

FMOH: Federal Ministry of Health

HEW: Health Extension Worker

IDSR: Integrated Disease Surveillance and Response

MDRF: Maternal Death Reporting Format (case based form)

MDSR: Maternal death surveillance and response

M&E: Monitoring and Evaluation

PHEM: Public Health Emergency Management

RMNCH: Reproductive, Maternal, Newborn and Child Health

RRT: Rapid Response Team

TWG: Technical Working Group

VA: Verbal Autopsy

WoHO: Woreda Health Office

WHO: World Health Organization

WRF: Weekly Reporting Format

Executive Summary

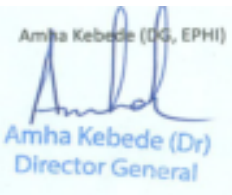
Maternal health is among the top health in Ethiopia. Considering the high burden of maternal mortality and its impact on the overall development of the nation, the FMOH has emphasized maternal health throughout its health sector development program. In May 2013, the national Maternal Death Surveillance and Response (MDSR) system was launched. Originally a stand-alone parallel data collection and analysis system, as for 2014, MDSR has been integrated into the existing Public Health Emergency Management (PHEM) system, and has been added as the 21st national notifiable diseases and conditions within the integrated disease surveillance and response (IDSR).

The aim of this integration process is to build on the strengths of national surveillance efforts, and draw together the complementary expertise provided through both PHEM and RMNCH directorates. The overall goal of MDSR is to ensure each maternal death leads to implementation of actions that will help prevent subsequent deaths, and will collectively lead to improved quality of care and elimination of preventable maternal mortality.

This integration manual has thus been prepared to standardize the implementation of MDSR in all parts of the country within the existing PHEM system. The manual emphasizes the use of the PHEM structure for coordination and collaboration of different actors in the implementation of maternal death surveillance and response, and provides guidance for PHEM staff at all levels of the Ethiopian health system as to their roles, responsibilities, and functions vis-à-vis MDSR. In addition, close collaboration with Reproductive, Maternal, Newborn and Child Health (RMNCH) colleagues throughout the system is also a key component of ensuring a well-functioning MDSR system that is able to routinely identify, collect, synthesize, and analyze data, leading to the identification and timely implementation of appropriate responses.

The target audience for this manual includes RMNCH program managers and surveillance officers at national, regional, zonal, sub-city and Woreda levels of the health system, as well as health service managers and providers, medical training institutions, professional institutions relevant to maternal health quality of care, and other stakeholders. Terms that are key to MDSR implementation are introduced and defined, followed by a detailed description of roles and responsibilities at each level and explanation for the data collection tools and set processes for data flow, management, analysis, and dissemination. A Monitoring and Evaluation framework for tracking MDSR performance and function is also provided, and the data collection tools are included as Annexes.

This manual accompanies the MDSR National Guidelines issued for the introduction of the national MDSR system.



1. Introduction

Pregnancy is a normal, healthy condition to which most women aspire at some point in their lives. Yet this routine, life-affirming process currently poses serious risk of death and disability. Every maternal death is a tragedy with consequences for the wellbeing of the woman's family. For example, the survival and development of her children, especially infants, are likely to be adversely affected. Each death further diminishes society at large. Nearly all maternal deaths are preventable and could be eliminated, even where resources are limited. A vital component of any elimination strategy is a surveillance system that not only tracks the numbers of deaths, but provides information about the underlying factors contributing to them – and how they should be tackled. Maternal Death Surveillance and Response (MDSR) is a model of such a system.

An estimated 13,000 women died from pregnancy and its complications in 2013 in Ethiopia, making the countries maternal mortality ratio 420/100,000 live births and contributing nearly 4% to the global maternal death burden[1]. However this maternal mortality ratio generated in the absence of civil vital registration and lacks precision as it is an estimate with a wide confidence interval. Inadequate measurement contributes to a lack of accountability and in turn to a lack of progress. By investigating a woman's death, MDSR inherently places value on her life – an important form of accountability for families and communities. An MDSR system provides essential information to stimulate and guide action to prevent future maternal deaths and improve how maternal mortality is measured [2].

Public health surveillance is the ongoing systematic collection, analysis, and interpretation of health data. It includes the timely dissemination of resulting information to those who need it for action. Surveillance is also essential for planning, implementation, and evaluation of public health practice [2-4].

Maternal Death Surveillance and Response (MDSR) is a form of continuous surveillance linking health information to quality improvement from local to national levels. It includes the routine identification, notification, quantification, and determination of causes and avoidability of all maternal deaths, as well as the use of this information to respond with actions that will prevent future deaths. Elimination of preventable maternal mortality is the goal of MDSR [2, 4].

A well-defined and enforced MDSR system stresses that maternal deaths should be incorporated within existing systems of disease reporting to ensure timely notification. MDSR also stresses the need to collect data on all maternal deaths that occurred in facilities as well as communities, and to use this information to provide a snapshot of weaknesses in the health-care delivery system as a whole – from the community through the various levels of referral to the tertiary care facility [2, 4, 5].

Integrated disease surveillance and response (IDSR) is one of the systems into which MDSR can be integrated by building on existing processes and guidelines and making specific recommendations for action. It is critical to create not a parallel system, but one that integrates within existing mechanisms of

reporting at country level; supporting IDSR is thus considered preferable to initiating a separate reporting system for maternal deaths [2-4, 6].

IDSR promotes rational use of resources by integrating and streamlining common surveillance activities. Surveillance activities for different diseases involve similar functions (detection, reporting, analysis and interpretation, feedback, action) and often use the same structures, processes and personnel. Several African countries have adapted the IDSR technical guidelines to the national context and included maternal mortality as a notifiable event [3, 4, 7].

Therefore, when MDSR integrates with IDSR, all its surveillance activities are coordinated and streamlined within the PHEM structure, taking advantage of the IDSR similar surveillance functions, skills, resources and target populations.

1.1. Rationale

Maternal health is among the top priorities of the health system in Ethiopia. Considering the high burden of maternal mortality and its impact on the overall development of the nation, the FMOH has emphasized maternal health throughout its health sector development program. According to the EDHS 2011, Ethiopia's maternal mortality ratio could be as high as 676/100,000live births [8, 9]. However, this estimated figure has its own inherent methodological shortcomings in providing an accurate figure for maternal deaths at national and subnational levels.

Considering the importance of evidence for improved maternal health program management and in implementing appropriate interventions, the FMOH launched the national MDSR in May 2013. The aims of MDSR are to prevent future maternal deaths by responding to data on preventable causes and contributing factors, and to count every maternal death at national and subnational levels.

To achieve these aims, MDSR collects accurate data on all maternal deaths (number, causes & contributing factors) followed by analysis and interpretation of trends, causes, contributing factors, risk factors, demographic and socio-political determinants. This data will be used to make evidence-based recommendations for action; increase awareness about the magnitude, social effects, and preventability of maternal mortality by different actors; monitor the implementation of recommendations; inform programs on the effectiveness of interventions and their impact on maternal mortality; allocate resources more effectively and efficiently by identifying specific needs; enhance accountability for maternal health; improve maternal mortality statistics and move towards complete civil registration/ vital statistics records; and guide and prioritize research related to maternal mortality [2, 4, 10].

Although, MDSR was originally implemented as a separate system to PHEM in 15 pilot zones, currently it has been integrated within the existing PHEM system. During its implementation as a separate system in the pilot areas it became apparent that more resources were required for its management and to maximize its effectiveness. Based on these lessons and WHO technical guidance recommendations, FMOH has developed this MDSR/PHEM integration manual. Currently PHEM is functioning as an integrated disease surveillance system for twenty one cases or events, including maternal death. These

diseases or events are categorized in either indicator-based or event-based surveillance. Maternal death being an immediately reportable event it is included under both systems of PHEM [7].

This manual has been prepared to standardize the implementation of MDSR in all parts of the country within the existing PHEM system. Therefore, this integration manual emphasizes the use of the PHEM structure for coordination and collaboration of different actors in the implementation of maternal death surveillance and response. Additionally, it provides guidance for future revision of the PHEM guidelines to incorporate maternal death.

1.2. Users of this manual

A variety of health programmers, health service providers and institutions working on maternal health can benefit from this manual. It is designed for use by:

1. Maternal Health care Program managers and IDSR officers at National, Regional, Zonal, Sub-City and Woreda levels
2. Health facility managers
3. Health service providers at community and health facility level (health extension workers, MCH and surveillance focal points in health facilities
4. Teaching institutions that train health professionals
5. Professional associations and partners working on MDSR
6. Other stakeholders

1.3. Objectives of this manual

1. To clarify definitions of concepts and issues used in MDSR
2. To guide the implementation of maternal death surveillance within the PHEM system
3. To give guidance on response management for maternal deaths at every level
4. To provide a framework for MDSR monitoring and evaluation within PHEM
5. To clarify roles and responsibilities of different actors for MDSR in the existing PHEM system

2. Definitions

2.1. Public health surveillance

Public health surveillance is the ongoing systematic collection, analysis, and interpretation of health data. It includes the timely dissemination of resulting information to those who need it for taking action. Surveillance is essential for the planning, implementation, and evaluation of public health practice [2, 3, 6, 7].

2.2. MDSR (Maternal death surveillance and response)

Maternal Death Surveillance and Response (MDSR) is a form of continuous surveillance linking the health information system to quality improvement processes from local to national levels. It includes the routine identification, notification, quantification, and determination of causes and avoidability of all maternal deaths, as well as the use of this information to respond with actions that will prevent future deaths. Elimination of preventable maternal mortality is the goal of MDSR [2, 4].

2.3. IDSR (Integrated disease surveillance and response)

IDSR is a strategy for comprehensive public health surveillance and response. IDSR promotes rational use of resources by integrating and streamlining common surveillance activities. Surveillance activities for different diseases involve similar functions (detection, reporting, analysis and interpretation, feedback, action) and often use the same structures, processes and personnel [2-4, 7].

2.4. Case Definitions of Maternal Death in Ethiopia

2.4.1. Community case definition (probable maternal deaths)

Death of a woman of reproductive age (between 15-49 years of age) [10]

2.4.2. Suspected maternal death:

Community case definition plus at least one of the following:

- Died while pregnant,
- Died within 42 days of termination of pregnancy or
- Missed her menses before she died [2, 10]

2.4.3. Standard case definition (confirmed maternal death):

“The death of a woman while pregnant or within 42 days of the end 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“ (Source: ICD-10) [2, 10]

2.5. Causes of maternal death

Maternal deaths can be categorized into direct obstetric deaths and indirect obstetric deaths based on their causes [1, 2, 5, 10, 11].

Direct obstetric deaths are maternal deaths resulting from obstetric complications of the pregnancy state (pregnancy, labor, or puerperium); from interventions, omissions, or incorrect treatment; or from a chain of events resulting from any of the above.

Indirect obstetric deaths are maternal deaths resulting from previously existing disease or disease that developed during pregnancy. These deaths are not due to direct obstetric causes, but are aggravated by the physiological effects of pregnancy.

2.6. Other related definitions

The Standard and community maternal death definitions of the national MDSR/PHEM system are *different* from the following two definitions [2, 5, 11].

Pregnancy related death: defined as all deaths of women during or within 42 days of pregnancy regardless of the cause"

Late maternal death: defined as a maternal death due to pregnancy (direct or indirect obstetric causes) which occurred more than 42 days but less than one year after the end of pregnancy."

Note: The above two definitions are not used in the national MDSR/PHEM system.

Maternal near misses: a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy. In practical terms, women are considered near miss cases when they survive life threatening conditions (i.e. organ dysfunction).

3. Surveillance of maternal deaths through PHEM

Components of maternal death surveillance:

- Case definition
- Sources of information for maternal death identification
- Identification and notification of maternal deaths
- weekly PHEM reporting of maternal deaths
- Maternal death investigation and verification
- Review of investigated and verified maternal deaths
- Case based maternal death reporting
- Case based maternal death data aggregation and analysis

3.1. Case definitions

Case definition of maternal deaths in Ethiopia

1. Community case definitions

1.1. Probable maternal death

Death of a woman of reproductive age group (between 15-49 years of age)

- It should be posted at health posts and in the kebele
- It is an immediately reportable event
- It is used in the PHEM weekly reporting format of health extension workers (WRF-HEW)

1.2. Suspected maternal death:

Community case definition plus at least one of the following:

- Died while pregnant,
- Died within 42 days of termination of pregnancy or
- missed her menses before she died

Those who fulfill this definition are:

- Reported in the PHEM weekly reporting format of health centers and above (WRF) for deaths reported from the community.
- To be investigated by conducting verbal autopsy by respective HEWs and detailed review at respective health center.

2. Standard case definition (confirmed maternal death):

The death of a woman while pregnant or within 42 days of the end 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 (Source: ICD-10)

- It should be posted and must be used in all health facilities (health centers, hospitals, private health facilities & NGO clinics).
- For all deaths who fulfill this definition, a detailed investigation must be done using facility based maternal death abstraction formats by their respective facility surveillance focal person and reviewed by the rapid response team (RRT).

3.2. Sources of information for maternal death identification

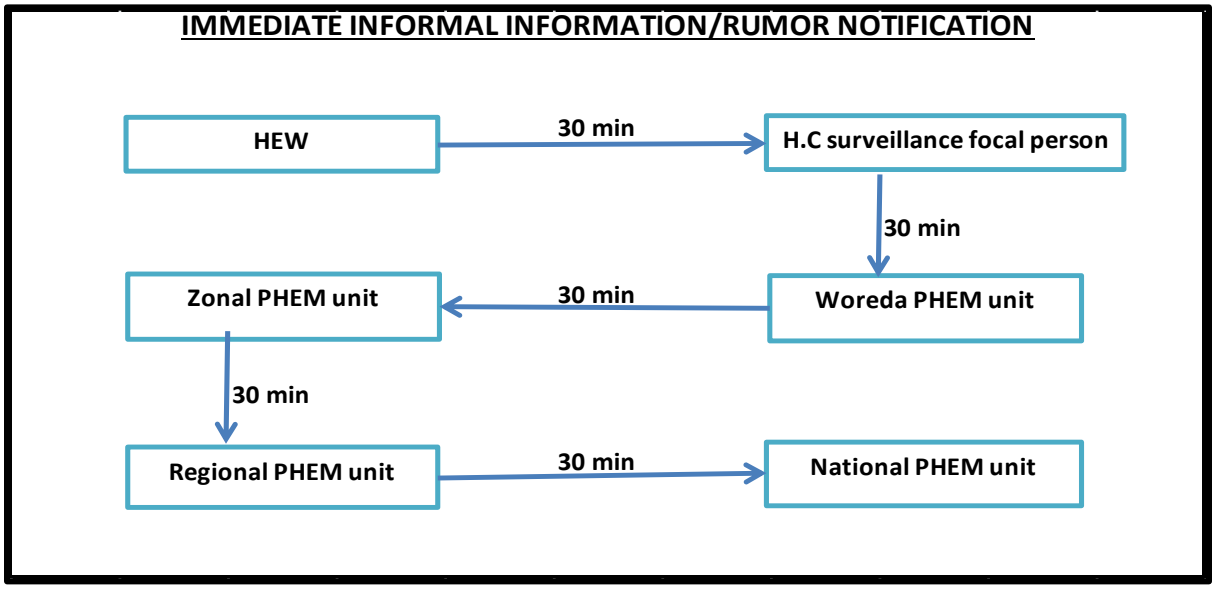
Although the sources of information for Indicator based-surveillance of maternal deaths (Community case definition or Standard case definition) are multiple and various, the two major primary sources of information for timely ***identification*** of maternal deaths are reports (formal or informal/ rumors) from **Communities and Health-care facilities** using any channel of communication.

3.2.1 Community report: all deaths of women of reproductive age (15-49) should be reported by any member of the community to their respective health institution (preferably health post or health center).

3.2.2 Health-care facilities report: all maternal deaths occurring in a health facility should be reported by health care providers to their respective facility based surveillance focal person.

3.3. Identification and notification of maternal deaths

3.3.1. Identification and notification of maternal death from the community:
All identified probable maternal deaths will be notified by health extension workers to their respective health center surveillance focal person. Informal information/rumor about probable maternal deaths will be reported immediately (within 30 minutes) to the next level of the PHEM structure by any channel of communication. Formal notification of probable maternal deaths will be reported within 24 hours (from the time of identification) by the HEW of the health post to the respective health center surveillance focal person using maternal death identification and notification format (two copies) (Annex-1) All completed notification formats at health post and health centers will be documented and used as source of data for weekly PHEM reporting.



3.3.2 Identification and documentation of maternal deaths reported from health care facilities:

All maternal deaths identified in health facilities will be formally documented using identification and notification format (Annex 1) by the respective health facilities surveillance focal person within 24 hours of identification. The source of data/ information will be health care providers in the facility (involved in the provision of health care to the woman), client charts, registers, death logs and other records from the previous 24 hours that are reviewed on a daily basis. All completed identification & notification formats in health facilities will be documented and used as a source of data for weekly PHEM reporting.

3.4. Weekly PHEM reporting of maternal deaths

3.4.1. Weekly PHEM reporting of maternal deaths from community:

The number of all ***probable maternal deaths*** that are notified and documented in the health post should be reported on a weekly basis using the health extension workers' weekly PHEM reporting format (Annex 2). Every Monday morning the total aggregated number of all probable maternal deaths notified and documented by the health post in the preceding week (Monday to Sunday) must be reported to the respective health center surveillance focal person by health extension workers.

3.4.2 Weekly PHEM reporting of maternal deaths from health care facility

3.4.2 A. Weekly PHEM reporting of maternal deaths from health centers

The number of all suspected maternal deaths that are notified from health posts and the number of all confirmed maternal deaths that are notified from health centers should be reported on a weekly basis using the weekly PHEM reporting format (Annex3). Every Monday (till mid-day) the total aggregated number of all suspected and confirmed maternal deaths that are notified & documented by the health center in the preceding week (Monday to Sunday) must be reported to the respective Woreda PHEM unit by the surveillance focal person .

3.4.2 B. Weekly PHEM reporting of maternal deaths from hospitals

The number of all confirmed maternal deaths that are notified and documented from hospital/clinics should be reported on a weekly basis using the weekly PHEM reporting format (Annex 3). Every Monday (till mid-day) the total aggregated number of all confirmed maternal deaths that are notified & documented by the hospital/clinic in the preceding week (Monday to Sunday) must be reported to the respective zone/ regional PHEM unit (depending on the context of reporting structure of PHEM) by the respective facility surveillance focal person.

Note: The aim of weekly reporting of maternal deaths is to monitor (enhance accountability and responsibility) the proper completion and reporting of verbal autopsies conducted at community level, and subsequent reporting using the case based maternal death report formats (MDRFs) by health facilities . Weekly reporting will not be used for counting maternal deaths. (Counting maternal deaths will be done from completed MDRFs, which will be used as evidence for programmatic management and evaluation of the effectiveness of interventions).

3.5. Maternal death investigation and verification

3.5.1 Investigation and verification of suspected maternal deaths reported from community:

All ***suspected maternal deaths*** that are documented at the health post and notified to the respective health center should be investigated and verified using the verbal autopsy format (Annex4). Within a week following the notification of the death, the verbal autopsy should be conducted and reported to the respective health center surveillance focal person.

The sources of information used to complete the VA format will be any community members (preferably those who were around the deceased during circumstances of death). Proper oral verbal ***informed consent*** should be obtained from the informant by the health extension worker using the standard contents of verbal consent using local language.

3.5.2 Investigation of confirmed maternal deaths reported from health care facility:

All confirmed maternal deaths that are notified and documented at a health facility should be investigated using the facility based maternal death abstraction format (FBMDA) (Annex6). Within a week following notification of a maternal death, the facility surveillance focal person must complete the FBMDA format.

The sources of information to complete the FBMDA format will be health care providers in the facility (involved in the provision of health care to the woman), client chart, registers, death logs and other records.

Proper verbal consent should be obtained from the facility/health care provider by the facility surveillance focal person using the standard contents of verbal consent.

N.B: Facility surveillance focal person should ensure the completeness of investigation and verification formats before review of death by rapid response team of the respective facility.

3.6. Review of completed investigation and verification formats

3.6.1 Review of verbal autopsies of suspected maternal deaths conducted in the community:

Each completed verbal autopsy should be reviewed by the rapid response team (RRT) of the respective health center within one week after the VA report is received. The health center RRT should include midwives and other related health professionals working in obstetrics. For every reviewed verbal autopsy, an action plan has to be developed for responses based on identified root causes of the woman's death (refer to response management in chapter 4). Following the review of the verbal autopsy, the health center surveillance focal person will complete the case based reporting format (maternal death reporting format/MDRF Annex 7) in five copies and send it to the respective Woreda PHEM unit.

A unique code should be given to every MDRF based on the following information obtained from the completed verbal autopsy format.

- 3 letters for the Region (e.g. Oromia: ORO)
- 3 letters for the zone(e.g East wolega: EWO)

- 3 letters for the Woreda (e.g. Kiramu: KIR)
- 3 letters for the health center (e.g. Kokofe: KOK)
- Year in Ethiopian calendar that the death occurred(e.g 2007: 07)
- Month number in the Ethiopian calendar that the death occurred(e.g. Hidar: 03)
- Serial number for the death in the health center in the month of investigation (If second maternal death: 02)

Sample Code: ***ORO-EWO-KIR-KOK-07-03-02***

3.6.2 Review of facility based maternal death abstractions of confirmed maternal deaths reported from health facilities:

Each completed facility based maternal death abstraction should be reviewed by the RRT of the respective health facility within one week following FBMDA completion and documented by the facility surveillance focal person. The health facility RRT should include midwives and other related health professionals working in obstetrics of that particular facility. For every reviewed FBMDA, an action plan has to be developed for responses based on the identified root causes of to the woman's death (refer to response management in chapter 4). Following the review of the FBMDA, the health facility surveillance focal person will complete the case based reporting format (maternal death reporting format/MDRF) in five copies (health centers and clinics) or four copies (hospitals). The MDRF should be immediately sent to the respective Woreda/zone or region PHEM unit (based on the context of the region).

A unique code should be given to every MDRF based on the following information obtained from the completed FBMDA format.

- 3 letters from the Region (e.g. Oromia: ORO)
- 3 letters for type of health facility:(hospital: HOS/health center: HEC/ clinic:CLI)
- 3 letters for the health facility name (e.g Bishoftu: BIS)
- Year in Ethiopian calendar that the death occurred(e.g. 2007: 07)
- Month number in the Ethiopian calendar that the death occurred(e.g. Hidar: 03)
- Serial number for the death in the health facility in the month of investigation (second maternal death: 02)

Sample Code: ***ORO-HOS-BIS-07-03-02***

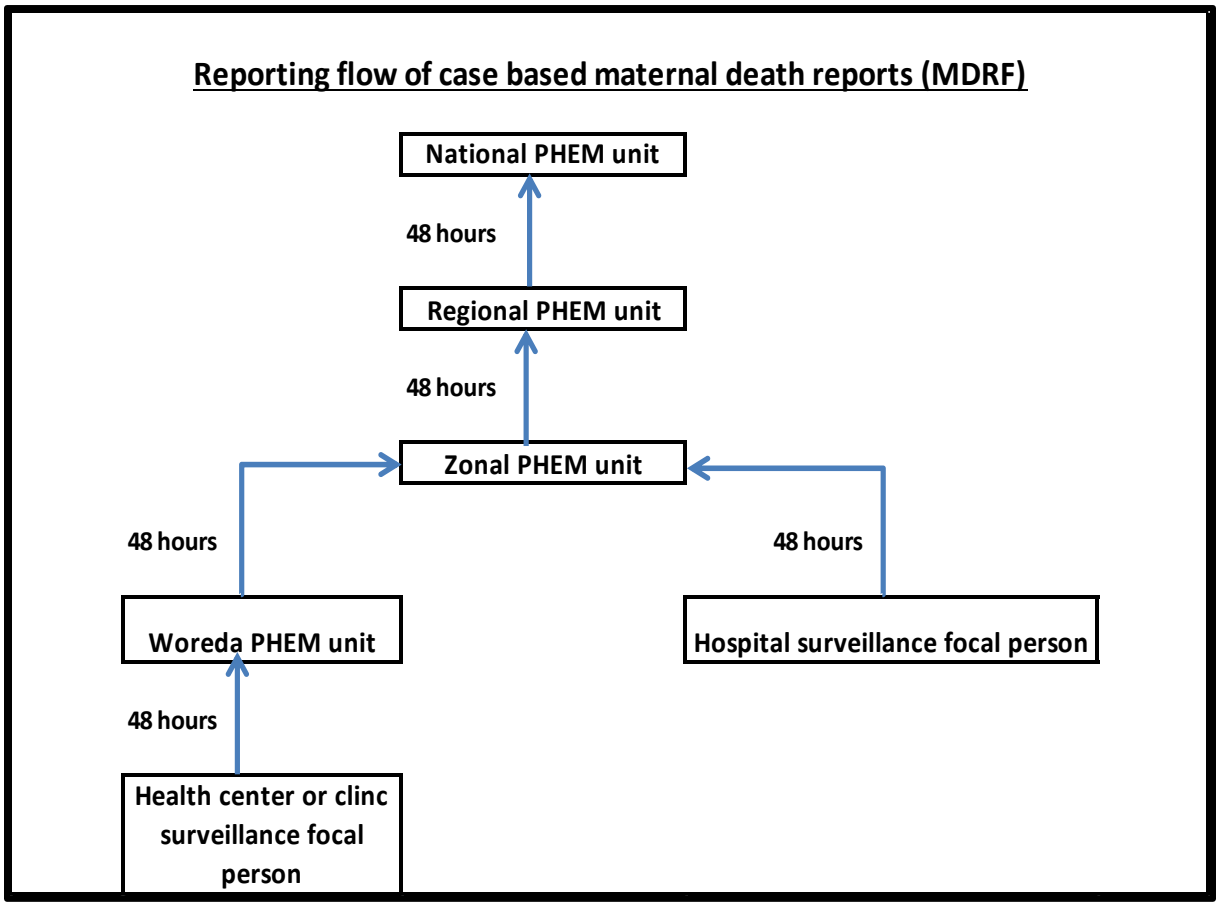
3.7. Reporting of case based maternal death reports (MDRF)

3.7.1 Reporting of case based maternal death reports (MDRF) from health centers

All MDRFs documented in health centers and clinics should be reported by the surveillance focal person within 48 hours to the respective Woreda PHEM unit. Among the five copies of the MDRF one copy will be kept in the reporting health center and the other four copies (Woreda, zone, region and national) must be submitted to the Woreda PHEM unit within 48 hours. Starting from the Woreda level PHEM unit, one copy will be kept and the remaining copies will be sent to the next levels of PHEM within 48 hours.

3.7.1 Reporting of case based maternal death reports (MDRF) from hospitals and other clinics

All MDRFs documented in hospitals should be reported by the facility surveillance focal person within 48 hours to the respective zonal PHEM unit. Among the five copies of the MDRF one copy will be kept in the reporting hospital/clinic and the remaining copies (woreda(from clinics only), zone, region and national) must be submitted to the zonal PHEM unit within 48 hours. The zonal PHEM unit will be keep one copy and the remaining two copies will be sent to the regional PHEM within 48 hours, and the regional PHEM unit will send one copy to national PHEM within another 48 hours.



3.8. Data management and analysis of maternal deaths

Aggregation and analysis of case based maternal death reports and weekly PHEM data are critical components of the MDSR system. This data will guide and orient appropriate public health measures for prevention of future maternal deaths and the promotion of maternal health at different levels.

Every MDRF should be checked for completeness at the time of reporting, and cleaning should be done for any missing data immediately. Errors or omissions should be communicated along the PHEM system. Subsequently, all variables should be entered into an excel spreadsheet with a maternal death line or directly into the maternal death data base provided by EPHI. Data entry should be conducted by PHEM units at Woreda level and above.

Analysis of data should be done on a monthly basis by the respective PHEM units and shared with the Woreda RRT/ERT (emergency response teams), RMNCH units, health bureau heads (deputy and head) and M&E units at all levels of the health system.

The results of the analyzed data should be reviewed by the respective Woreda RRT/ERT or MDSR technical working groups at every level. The Woreda RRT/ERT or MDSR TWGs will prepare a review report and recommendations. These recommendations will be used in the development of a response action plan, which will be used in the monthly, quarterly, semiannual and annual plans of RMNCH and other relevant sectors at every level.

At minimum, maternal death data analysis should be conducted for the following:

1. Descriptive:
    a. Individual Characteristics :Age group, marital status, level of education, religion, ethnicity, gravidity/parity, delivery outcome
    b. Timing: date of death, timing of death in relation to pregnancy
    c. Location: place of death(home, health post, health center, hospital, on transit others), residency of the deceased
2. Contributing factors: relevant three delays and their breakdown of factors
3. Cause of death: direct, indirect and specific cause of death
4. Trend analysis: change in number of maternal deaths and the above variables with respect to time, Specific causes of death proportion changes through time
5. Geographical analysis: the distribution of maternal deaths by geographical area and if possible using GIS (geographical information system)

4. Maternal death response management

Every maternal death provides information that can result in actions to prevent future deaths in a similar context (hospital, clinic and health center with its catchment area). Additionally aggregated and analyzed data from MDRF and WRFs provides robust information about problems shared by various communities, facilities, woredas and higher levels.

Components:

4.1 Response management for a single maternal death

4.2 Response management of aggregated maternal deaths

4.1. Response management for a single maternal death

For each maternal death, the health facility RRT should review the completed investigation and verification formats (VA or FBMDA) to identify problems that resulted in a maternal death. For each of the identified problems, the RRT will develop an action plan which will be implemented accordingly in order to prevent future similar deaths. The developed action plan should be reported to and documented at facility CEO/medical director office, RMNCH unit and its respective Woreda health office.

During implementation, the facility surveillance focal person will monitor and document the implementation status of the action plan and report to the facility CEO/medical director. Depending on the nature of the issues identified, responses can be immediate, medium term and/or long-term. Similarly, responses can be implemented by community, health post, different units of health facilities, and by higher levels starting from Woreda/zone.

4.2. Response management of aggregated maternal deaths

Based on the results of the aggregated data, respective MDSR TWGs/ task forces at every level will review and make recommendations for action. The Woreda RRT/ERT or MDSR TWG will prepare a review report and its recommendations. The PHEM units will organize dissemination of the review report and recommendations to multiple sectors and partners, together with respective RMNCH units. At Woreda level, the emergency response team/RRT will develop response action plan for implementation. Additionally, the RMNCH units of Woreda health office, RHBs and FMOH, and other relevant sector units will incorporate the recommendations in their monthly, quarterly, semiannual and annual program plans. At national level the findings and recommendations will guide the development of strategic plans for different sectors.

5. Roles and Responsibilities

5.1.Community Level

- Upon encountering a probable maternal death, any community member will immediately (within30minutes) notify the HEW or the nearest available health facility and administrative level.
- Health extension workers will identify and notify probable maternal death reports from the community to the respective health center surveillance focal person using the community case definition for maternal death within 24 hours.
- HEWs will completely fill verbal autopsies for suspected maternal deaths within 01-week after notification (in two copies) and submit one copy to the respective health center surveillance focal person.
- HEWs will make a summary total of detected probable maternal deaths and report to the respective health center surveillance focal person on a weekly basis every Monday morning using WRF-HEWs formats.
- HEWs and the community will implement responses per the review findings of every maternal death and recommendations of the health center's RRT to prevent similar deaths occurring due to delay-1&2.

5.2.Health Facility

- Upon receiving a report of a probable maternal death from HEWs or community members, the health center surveillance focal person is expected to immediately (within 30 minutes) notify the PHEM focal person of the respective Woreda using the fastest available means of communication.
- The health center surveillance focal person will receive the completed identification and notification format within 24 hours of initial notification, followed by the verbal autopsy of all suspected maternal deaths within one week of notification. It will receive WRF-HEWs every Monday morning that report all probable maternal deaths from HEWs.
- Any health care provider of a health facility (HC, hospitals and clinics) will immediately (within 30 minutes) notify confirmed maternal deaths to the surveillance focal person of the facility, who will immediately report it to the next PHEM level (Woreda/zone or RHB) using the fastest available means of communication. The maternal death will be documented using the identification and notification format by the facility surveillance focal person within 24 hours of initial notification.
- The health facility surveillance focal person will complete the facility based maternal death abstraction format (FBMDA) for every confirmed maternal notified from the facility within 1 week of initial notification.
- The facility RRT will review FBMDA and VA within 1week, and complete the MDRF (in five copies) and develop a response action plan for every maternal death (suspected or confirmed). MDRFs will be sent by the surveillance focal person within 48 hours to the immediate higher level PHEM unit.
- The facility surveillance focal person will make a summary total of detected maternal deaths (suspected or confirmed) each week using WRF and will send thus to the immediate higher level PHEM unit every Tuesday morning.
- The PHEM focal person will ensure implementation of the response action plan and update the RRT on implementation status in collaboration with the MNCH head of the facility.

5.3.Woreda Health Office

- At Woreda level there should be a PHEM officer who works closely with the MNCH officer for MDSR/PHEM. Additionally there should be a Woreda level RRT/ERT led by the Woreda administrator for multi-sectorial response management of MDSR/PHEM.
- The Woreda PHEM officer receives WRF from health centers on a weekly basis (every Tuesday morning) and sends the rest of the WRF copies of to the zonal/regional PHEM unit, keeping one copy in the Woreda PHEM unit.
- Similarly, the Woreda PHEM unit/officer receives MDRFs from all health centers within one month following receipt of WRFs for all suspected/confirmed maternal deaths. The PHEM officer should check the MDRFs for completeness and send the rest of the copies to the zonal/regional PHEM unit, keeping one copy in the Woreda PHEM unit.
- On a regular basis, the PHEM officer will compile and analyze WRF and MDRF data, and produce a report. The report will be shared with the MNCH officer for interpretation and the development of an action plan.
- In collaboration with the MNCH unit and Woreda administrator, the PHEM officer will organize a dissemination meeting for multi-stakeholders of the RRT/ERT to plan and implement responses included in the action plan. During response implementation, the PHEM officer will ensure/ monitor that the identified actions are undertaken as planned.
- Health related responses will be included in the monthly, quarterly, semiannual and annual plans of the Woreda MNCH & other units of WeHO, and other relevant sectors in the Woreda.

5.4.Zonal Health Office (where applicable)

- At zonal level there should be a PHEM officer who works closely with the PHEM and MNCH officers of the RHB and Woreda health offices for MDSR/PHEM.
- The Zonal PHEM officer receives WRF from Woreda health offices and hospitals on a weekly basis (every Wednesday morning) and sends the rest of the copies every Thursday to the regional PHEM unit, keeping one copy in the zone.
- Similarly, the zonal PHEM unit/officer receives MDRFs from all Woreda health offices and hospitals within one month of receiving WRFs of suspected/confirmed maternal deaths. The PHEM officer should check for completeness of the MDRFs and send the rest of the copies to the regional PHEM unit, keeping one copy in the zone.

5.5.Regional Health Bureau

- At RHB level there should be a PHEM unit that works closely with the MNCH unit of the region for MDSR/PHEM. Additionally, there should be a regional level MDSR/PHEM TWG led by the assigned PHEM officer for MDSR, in close collaboration with the MNCH unit. For response management, the regional multi-sectorial MDSR/PHEM task force will be coordinated by the regional PHEM unit head.
- The regional PHEM unit receives WRF from Woreda health offices/zonal health offices and hospitals (depending on the existing PHEM structure) on a weekly basis (every Thursday morning) and sends

the rest of the WRF copies to the National PHEM unit every Friday morning, keeping one copy in the regional PHEM unit.

- Similarly the regional PHEM unit receives MDRFs from all Woreda health offices/zonal health offices and hospitals (depending on the existing PHEM structure) within one month of receipt of WFRs for suspected/confirmed maternal deaths. The PHEM unit checks MDRF completeness and sends the other MDRF copies to the national PHEM unit, keeping one copy in the regional PHEM unit.
- On a regular basis the PHEM unit will compile and analyze WRF and MDRF data, and produce a report. The report will be shared with the MNCH unit of the RHB for interpretation and development of the action plan by the MDSR TWG..
- In collaboration with the MNCH unit and regional administrator, the PHEM unit will organize a dissemination meeting for regional PHEM multi-sectorial stakeholders to plan and implement responses identified in the action plans of the MDSR TWG. During action plan implementation, the PHEM unit will ensure/ monitor that identified responses are undertaken as planned.
- Health related responses will be included in the monthly, quarterly, semiannual and annual plans of the regional MNCH and other units of RHB.
- Non health related responses will be included in the monthly, quarterly, semiannual and annual plans of other relevant sector units.

5.6.Central/National

- At national level there is a PHEM unit within EPHI that works closely with the MNCH unit of the FMOH of Ethiopia on MDSR/PHEM. Additionally there is a national level MDSR/PHEM TWG jointly led by the assigned PHEM officer for MDSR, which collaborates with the MNCH unit. For response management, the national multi-sectorial MDSR/PHEM task force will be coordinated by the national PHEM director general.
- The national PHEM unit receives WRFs from regional PHEM units on a weekly basis (every Friday morning).
- Similarly the national PHEM unit receives MDRFs from all regional PHEM units within one month of WRF reports of suspected/confirmed maternal deaths. The national PHEM unit checks MDRF completeness.
- On a regular basis the PHEM unit will compile and analyze the WRF and MDRF data and produce a report. The report will be shared with the MNCH unit of the FMOH for interpretation and development of an action plan by MDSR TWG.
- The PHEM unit collaborating with the MNCH unit and FMOH higher officials will organize a dissemination meeting for national PHEM multi-sectorial stakeholders to plan and implement responses included in MDSR/TWG action plans. During implementation the PHEM unit will ensure/ monitor that identified responses are undertaken as planned.
- Health related responses will be included in the monthly, quarterly, semiannual and annual plans of the national MNCH unit and other units of FMOH.
- Non health related responses will be included in the monthly, quarterly, semiannual and annual plans of other relevant sector units.

6. Monitoring and Evaluation of MDSR system

Monitoring and Evaluation of the MDSR system is essential to assess how the system is functioning compared to set objectives and intended outcomes, and to improve its performance based on evidences. This MDSR Monitoring and evaluation framework is designed to track the overall system, its process components and its desired impact. Each part of this framework has defined indicators, data sources, targets and M&E responsibilities. The table below details the MDSR/PHEM monitoring and evaluation plan.

Table: 1: MDSR/PHEM Monitoring and Evaluation framework

	Indicators	**Indicator Definition(Numerator /Denominator)**	**Target**	**Means of verification: Data source**	**Frequency of data collection**	**Responsible body**
1.1 .overall system						
1.1.1	Maternal death is a notifiable event	*Maternal death is identified and notified through the PHEM system*	Yes	Program records and Weekly PHEM reports	Once up to end of 2015	PHEM units at Woreda, region and national
1.1.2	All health facilities are using revised PHEM tools for maternal death surveillance and response	*All health facilities are using revised PHEM tools that include maternal deaths*	Yes	PHEM facility records and reports of WRF and supportive supervision	Quarterly	PHEM units at all levels
1.1.3	Maternal death is one of the performance indicators of PHEM	*Maternal death indicator is listed among PHEM performance indicators that are reported and reviewed regularly*	Yes	PHEM performance report and review meeting proceedings report	Annually	PHEM units at all levels
1.1.4	PHEM and RMNCH annual plans include MDSR activities at all levels	*Annual work plan of PHEM and RMNCH at all levels have included MDSR activities*	Yes	Regular Supportive supervision	Semi Annual, Annually	PHEM and MNCH units all levels
1.2 Functional MDSR TWG						

1.2.1	National MDSR TWG exists	MDSR TWG at national level established and functions	Yes	EPHI/PHEM and RMNCH performance report	Annually	PHEM and RMNCH units at national level
1.2.2	National PHEM unit assigned someone responsible for MDSR	*Responsible person for MDSR assigned at EPHI/PHEM*	Yes	EPHI/PHEM performance report or supportive supervision	Semi annual	National PHEM unit
1.2.3	Number of national MDSR TWG meetings conducted	*Total number of MDSR TWG meetings conducted per year*	12 per year	Review of TWG meeting minutes	Semi annual	PHEM/RMNCH
1.2.4	Number of Regional PHEM units with someone assigned for MDSR	Number of regional PHEM units with assigned MDSR focal person	11	Regional PHEM performance report	Quarterly	PHEM unit at regional and national level
1.2.5	Number of regions with established MDSR TWG	Number of regions with established MDSR TWG	11	Regional PHEM performance report and/or supportive supervision	Quarterly	PHEM unit at regional and national level
1.2.6	Number of regional MDSR TWG meeting conducted (disaggregated by region)	Number of regional monthly MDSR TWG meetings conducted	132(12 per region)	Regional PHEM performance report and/or supportive supervision& review of MDSR TWG meeting minutes	Quarterly	PHEM unit at regional and national level
1.2.7	Proportion of woreda ERT/RRTs including maternal death as part of their epidemic preparedness and response plan(EPRP)	*N: Number of woreda ERT/RRTs with maternal death in their EPRP/ D: Total number of woreda ERT/RRT*	80%(first year), 100%(second year and above)	regional PHEM performance report and review of EPRPs during supportive supervision	Annually	PHEM unit national, regional and Woreda levels
1.2.8	Proportion of health facility RRTs including midwives & other professionals working in obstetrics as members	*N: Number of health facility RRTs included midwives & other professionals working in obstetrics as members D:/Total number of health facility RRTs*	100%	Review of RRT meeting minutes during Supportive Supervision	Semiannual/ Quarterly	National, Regional and Woreda PHEM units

1.2.9	Number of Quarterly maternal mortality reports produced	Maternal Mortality report produced at National and regional level on Quarterly bases	48(4-national and 44 regional) MM reports	National or regional Maternal Mortality reports	Quarterly	National and regional MDSR TWGs
1.3 Capacity building						
1.3.1	Proportion of PHEM officers trained on MDSR	*N: Number of PHEM officers trained on MDSR /D: Total number of PHEM officers*	100%	Training reports and supportive supervision	Semi annual	PHEM units at all levels
1.3.2	Proportion of MNCH officers/focal persons trained on MDSR	*N: Number of MNCH officers trained on MDSR at National ,Regional and Woreda levels /D: Total number MNCH officers at regional ,Woreda, and National levels)*	100%	Training reports	Semi annual	RNMCH units at all levels
1.2.3	Proportion of facility RRTs with at least one member trained on MDSR	*N: Number of facility RRTs with at least one member trained on MDSR /D: Total number of facility RRTs*	100%	Supportive Supervision report	Semi annual	PHEM Units at all levels
2.1 Identification and notification (Health facility)						
2.1.1	Proportion of maternal deaths in a facility notified to surveillance focal person within 24 hours	N: number of maternal deaths notified from facility to surveillance focal person within 24 hours/D: total number of maternal deaths identified &notified in a facility	>90%	Documented Identification and notification formats reviewed during supportive supervision	Quarterly	PHEM units at facility, Woreda and RHB levels
	2.2 Identification and notification (Community)					

2.2.1	Proportion of probable maternal deaths reported to the health post within 24 hours	*N: number of probable maternal deaths in a notified to HEWs/HPs within 24 hours/D: total number of probable maternal deaths identified in a community*	≥90%	Documented identification and notification formats review during supportive supervision	Quarterly	PHEM units at HC, Woreda, region and national levels
2.2.2	Proportion of probable maternal death reports notified by health centers	*N: number of probable maternal deaths documented in health centers/D: total number of probable maternal deaths documented in all HPs within the HCs catchment*	100%	Identification and notification format documentation, supportive supervision	Quarterly	PHEM units at HC and Woreda level
2.2.3	Proportion of expected material death notified to next levels	*N: number of maternal deaths notified/D: estimated number of maternal deaths*	≥90%	Aggregated WRFs and MDRFs data analysis reports of PHEM	Annually	PHEM Unit at all levels
	3. Maternal death investigation and verification					
3.1	Proportion of suspected maternal deaths with completed verbal autopsies	*N: number of completed verbal autopsies/Total number of suspected maternal deaths in the same period*	100%	Review of documented identification & notification formats, and Verbal autopsies in HC's during Supportive supervision	Quarterly	PHEM Units at Woreda and above levels
3.2	proportion of confirmed maternal deaths occurred at health facility level with completely filled facility based maternal death abstraction format	*N: number of completed FBMDAF /Total number of confirmed maternal deaths at HFs*	100%	Review of documentation of identification & notification formats and FBMDAFs in health facilities during supportive supervision	Quarterly/ Semi annual	PHEM Unit at Woreda and above levels
3.3	Proportion of confirmed maternal death reviewed at the health facility level	N: number of reviewed maternal deaths reported from facility/D: Total number of confirmed maternal deaths	100%	Supportive supervision report	Semi annual	PHEM units at Woreda, region and national

4. MDRF and WRF data aggregation and analysis (at Woreda, zone, RHB and FMOH)						
4.1	Proportion of woredas/Zones/regional PHEM units producing monthly MDSR aggregated &summarized data for review	*N:Number of woredas/Zones/Regional PHEM units producing monthly aggregated and summarized data for review D: Total number of Woreda/zones/regions*	≥90%	Supportive supervision report	Semi annual	PHEM units at Woreda, region and national
4.2	Proportion of maternal deaths(suspected plus confirmed) reported with case based reporting format(MDRF)	*N: number of maternal deaths(suspected plus confirmed) reported with case based forms(MDRF) per month / D: Total number maternal deaths in a month (aggregated from weekly PHEM report)*	≥80%	Routine PHEM reports(WRFs and MDRFs) and supportive supervision	Monthly, Quarterly and Semi annual	PHEM units at all levels
5. Response management						
5.1	Proportion of reviewed maternal deaths with developed action plan	N:Number of action plans developed /D: total number of reviewed maternal deaths in same period	90%	Supportive supervision report	Semi annual	PHEM units at Woreda, region and national
5.2	MDSR TWGs/RRTs develop action plan per recommendations of the review	*TWGs/RRTs with documented MDSR action plans*	Yes	Supportive supervision report	Semi annual	PHEM and RMNCH units Woreda and above levels
5.3	PHEM and MNCH units collaboratively organize multi-sectorial dissemination workshops on review findings and its action plan	*Multi-sectorial MDSR dissemination workshops conducted*	Yes	PHEM Performance report	Semi annual	PHEM & MNCH at national and regional levels
5.1	Regular development of multi-sectorial action plans	Multi-sectorial action plans developed	Yes	PHEM Performance report	Semi annual	PHEM & MNCH national and

						regional levels
5.1	Regular update of multi-sectorial action plan implementation by PHEM units	*Update reports produced on multi-sectorial action plan implementation by PHEM*	Yes	PHEM Performance report	Semi annual	PHEM & MNCH national and regional levels
6. Data quality						
6.1	Proportion of health facilities submitting weekly maternal death reports on time to the Woreda	*N: number of health facilities reported in a week /D: Total number of health facilities expected to report*	≥80%	Routine PHEM report(monitoring chart)	Weekly	PHEM unit at National, Regional and Woreda levels
6.2	Proportion of woredas submitting weekly maternal death reports on time to the next higher level	*N: number of woredas submitting weekly maternal death report on time/ Denominator: Total number of woredas expected to report*	≥80%	Routine PHEM report(Monitoring chart)	Weekly	PHEM unit at National, Regional and Woreda levels
6.3	Proportion of health facilities submitting surveillance reports to Woreda/region in a week	*N: number of health facilities submitting weekly maternal death report in a week/D: Total number of health facilities expected to report*	≥80%	Routine PHEM report(Monitoring chart)	Weekly	PHEM unit at National, Regional and Woreda levels
6.4	Proportion of reported MDRFs cross checked with investigation and verification formats on same maternal death	*N: number of MDRFs cross checked with their respective VA's or FBMDRFs/ D: total number of MDRFs reported*	≥5% of deaths cross-checked	Supportive supervision report	Semi annual	Woreda, region and national PHEM units
6.5	Proportion of sample of probable maternal deaths that are correctly identified as not suspected maternal	*N: Number of sampled of probable maternal deaths checked to be non-maternal deaths D: Total number of*	≤10% of rechecked probable maternal	Supportive supervision report	Semi annual	woreda, region and national PHEM units

	deaths	*probable maternal deaths checked*	deaths are suspected maternal deaths			
7. Impact						
7.1	Proportion of ANC clients who attended by skilled birth attendant during delivery	*N:numer of ANC clients attend by SBS during delivery/D: total number ANC clients*	≥95%	Semiannually, source: HMIS report	Semi annual	Plan and policy directorate, MOH
7.2	Skilled birth attendance rate	*N: number of women attended by SBA during delivery/ D: total number of deliveries*	≥85%	Semiannually, source: HMIS report	Semi annual	Plan and policy directorate, MOH
7.3	Maternal mortality ratio determined	*Maternal mortality ratio determined at National, Regional and Woreda levels*	Yes	Performance reports	Annually	Plan and policy directorate, MOH
7.4	Maternal mortality ratio	*maternal mortality ratio at the end of the year*	Reduced by 10% annually	Annual program Performance reports	Annually	Plan and policy directorate of MOH and RHBs
7.5	Facility maternal mortality ratio/lethality rates determined	*Facility maternal mortality ratio/lethality rates determined*	Reduced by 10% annually	Performance reports	Annually	Plan and policy directorate, MOH&RHBs

Annexes

Summary MDSR framework

Steps of MDSR/PHEM		Community based maternal death report	Health facility based maternal death report
Maternal death Surveillance	***Case definition***	Community case definition	Standard case definition
	Sources of data	Any community member, HEW	Any health care provider
	Identification and notification	• Tool : Annex 1 • Timing : 48 hrs • Reporting modality: available means including telephone / from HP to HC	• Tool : Annex 1 • Timing : 24 hrs • Reporting modality: documenting
	Weekly reporting of number of deaths (at least probable MD)	• Timing: Every Monday morning • Flow: telephone/fax followed by formal submission • Tools (WRF-HEW and WRF)	• Timing: Every Monday midday • Flow: telephone/fax followed by formal submission • Tools (WRF)
	Maternal death investigation and verification	• Tool: Verbal autopsy (VA) • Responsible person: HEW • Timing: 01 week	• Tool: Facility based maternal death summary (FBMDS) • Responsible person: PHEM focal person • Timing: 01 week
	Review of investigation and verification filled formats	• Coding and Review of VA • Responsible team: RRT of H.C • Timing: within 01 week after VA • MDRF • Response planning	• Coding and Review of FBMDS • Responsible team: RRT of H.C • Timing: within 01 week after FBMDRS • MDRF • Response planning
	MDRF (case based reporting) reporting	• Timing • Flow • Tools: five copies of MDRF's (contains: general information, VA and FBMDS contents)	• Timing • Flow • Tools: five copies of MDRF's (general information, VA and FBMDS contents)

	MDRF and WRF data aggregation and analysis (at Woreda, zone, RHB and FMOH)	• Source of data: WRF and MDRF
		• Tool: excel version of
		  ○ Weekly PHEM data base
		  ○ MDRF line listing
		  ○ MDRF data base at national and regional HB level	

Response management	***Response management***	• Implementation and monitoring at community level	• Implementation and monitoring at facility level
	Response management (at Woreda, zone, RHB and FMOH)	• Use analysis result for maternal health and related programs in planning, implementation and evaluation: quarterly, semiannually and annually	
Monitoring and evaluation		• Components of MDSR/PHEM for M&E • M& E indicators • Data source/means of verification • Target	

Annex 1: Identification and Notification form

(To be filled in two copies, one copy kept at HP or reporting ward and the remaining one copy will be documented at health facility surveillance unit)

Section one (Notification)		
1.	Maternal death Notification is reported from	☐ Community ☐ Health facility (MRN_____ Ward on which death occurred _____)
2.	Name of the deceased	_____
3.	Age of the deceased woman (in completed years)	_____
4.	Name of head of the household:	_____
5.	Household address	Woreda/Sub-city _____ Kebele _____ Gott _____ HDA team _____ house number: _____
6.	Date and time of the woman's death	DD/MM/YYY ____/____/_____ Time _____
7.	Who informed the death of the woman?	1. HDA 2. Religious leader 3. any community member 4. Self (HEW or Surveillance focal person) 5. Other Health care provider 4. Others (specify) _____
8.	Date of Notification:	DD/MM/YYY ____/____/_____
9.	Place of death:	1. At Home 2. At Health Post 3. At Clinic 4. At Health Center 5. At Hospital 6. On transit from home to Health facility 7. On transit from health facility to health facility
Screening of notified Maternal deaths **[to be filled by Health Extension Worker(Community report) or facility surveillance focal person(H.F report)]**		
8.	Did she die while pregnant?	☐ Yes ☐ No
9	Did she die with 42 days of termination of pregnancy?	☐ Yes ☐ No
10	Has she missed her menses before she dies?	☐ Yes ☐ No ☐ Unknown
Section two (Classification and decision for investigation) **[To be filled by Facility Surveillance Focal Person(For both H.F report and community based report)]**		
1.	Type of maternal death:	☐ Probable ☐ Suspected ☐ Confirmed
2	**If suspected or confirmed maternal death, write ID number/code**	_____

Annex 2: Weekly Report Form for Health Extension Workers (WRF_HEW)

Health Post name		Woreda	
Kebele		Zone	
Start of week from Monday _____/_____/_____ *(day) (month) (Year in Ethiopian Calendar)* to Sunday _____/_____/_____ *(day) (month) (Year in EC)*			

1. Record below the total number of cases for each disease/condition for the current week.

Indicator		**Total Cases**
Total Malaria (confirmed by RDT + clinically diagnosed as malaria)		
Total malaria suspected fever cases examined by RDT		
Number of fever cases positive for malaria parasites (by RDT)	*P. falciparum*	
	P. vivax	
Meningitis (suspected)		
Bloody Diarrhea		
Acute febrile illness (other than malaria and meningitis)		
Severe Acute Malnutrition (MUAC < 11cm and/or Bilateral Edema in under 5 years children (new cases only))		

RDT = Rapid Diagnostic Test; MUAC = mid upper arm circumference

2. Summary for Immediately Reportable Diseases/Conditions:

DISEASE	**C**	**D**	**DISEASE**	**C**	**D**	**DISEASE**	**C**	**D**
AFP/Polio			Fever + Rash			Hemorrhagic Diseases		
Anthrax			Neonatal Tetanus			Guinea worm		
Acute Watery Diarrhea			Influenza Like Illnesses			Deaths of women of reproductive age (15-49)years		
Rabies			Other (specify):_____			Other (specify):_____		

C = case; D = death

Look at the trends, abnormal increase in cases, improving trends? Actions taken and Recommendations:

_____

_____

_____

Date sent by HF/Woreda/Zone/Region: _____/____/_____ Date received at Woreda/Zone/Region: ____/_____/_____

Sent by: _____ Received by: _____

Tele: _____ Tel: _____

E-mail:_____ E-mail:_____

Annex 3: Weekly Disease Report Form for Outpatient and Inpatient Cases and Deaths (WRF)

Health facility name and type		Woreda	
Zone		Region	
Start of week from Monday _____/_____/_____ to Sunday _____/_____/_____ *(day) (month) (Year in Ethiopian Calendar) (day) (month) (Year in EC)*			

1. Record below the total number of cases and deaths for each disease/condition for the current week.

Indicator		**Out - Patient**	**In - Patient**	
		Cases	**Cases**	**Deaths**
Total Malaria (confirmed and clinical)				
Total malaria suspected fever cases examined by RDT or Microscopy				
Number cases positive for malaria parasites (either by RDT or Microscopy)	*P. falciparum*			
	P. vivax			
Meningitis				
Dysentery				
Typhoid fever				
Relapsing fever				
Epidemic Typhus				
Severe Acute Malnutrition /MUAC < 11cm and/or Bilateral Edema in under 5 years children (new cases only)				

RDT = Rapid Diagnostic Test; MUAC = mid upper arm circumference

2. Report timeliness and completeness (to be filled only by Woreda Health Office and Zone/Regional Health Bureaus)

Indicator	Government			NGO	Others
	H. Post	H. Center	Hospital	Health Facility	
Number of sites that are supposed to report weekly					
Number of sites that reported on time					

3. Summary for Immediately Reportable Case-based Disease / Conditions: (Total cases and deaths reported on case-based forms or line lists during the reporting week)

DISEASE	**C**	**D**	**DISEASE**	**C**	**D**	**DISEASE**	**C**	**D**
AFP/Polio			Maternal Death (Confirmed)			SARS		
Anthrax			Measles			Small pox		
Cholera			Neonatal Tetanus			Viral hemorrhagic fever		
Dracunculiasis (Guinea worm)			Pandemic Influenza			Yellow fever		
Deaths of women of reproductive age (15-49)years			Rabies			Other(specify):_____ _____		
Maternal Death (Suspected)			Other (specify): _____					

C = case; D = death; SARS = severe acute respiratory syndrome NOTE: Official counts of immediately notified cases come only from case forms or line lists.

Look at the trends, abnormal increase in cases, deaths, or case fatality ratios? Improving trends? Actions taken and Recommendations

_____

_____

_____

Date sent by HF/Woreda/Zone/Region: _____

Sent by: _____

Tele: _____

E-mail:_____

Date received at Woreda/Zone/Region: _____

Received by: _____

Tel: _____

E-mail:_____

Annex 4: Verbal autopsy tool (maternal death review tool at community level)

[To be undertaken for all suspected maternal deaths irrespective of place of death, including facility deaths]

I. People who participated in the interview:				
Note: *A person who was there at the time of illness or death can participate in the interview. Up to four interviewees can be interviewed.*				
S.N	**Name of the Interviewees**	**Relationship with the diseased**	**Was around at the time of:**	
			Illness	**Death**
1			☐Yes ☐No	☐Yes ☐No
2			☐Yes ☐No	☐Yes ☐No
3			☐Yes ☐No	☐Yes ☐No
4			☐Yes ☐No	☐Yes ☐No

II. Interviewer Information		
1	Interviewer name:	_____
2	Date of interview:	DD/MM/YYYY _____/_____/_____/
3	Language of interview:	_____
4	Phone number of interviewer	_____

III. Identification/ Back ground information:		
No	Questions	Response
1	ID Number	
2	Age of deceased	
3	Time of death and date of death	
4	Ethnicity	
5	Place of Death	1. Home/ Relatives' Home (Name: _____) 2. Health Post (Name of HP: _____) 3. Health Centre (Name of HC: _____) 4. Hospital (Name of hospital: _____) 5. In Transit (Distance from the destination in km: _____)
6	Place of residency of deceased	Woreda/sub-city _____ Got_____ Kebele _____ House number_____
7	Marital status of the deceased	1. Single 3. Divorced 2. Married 4. Widowed
8	Religion of deceased	1. Orthodox 3. Protestant 2. Muslim 4. Others (specify)------
9	Educational status of the deceased	1.No formal Education 2.No formal education, but can read and write 3.Elementary school 4. High school 5. College and above 4. Don't know
10	Level of education of the husband	1. No formal Education 2. No formal education, but can read and write 3.Elementary school 4. High school 5. College and above 4. Don't know
11	Occupation of the deceased	1. Farmer 5. Unemployed 2. Merchant/tradesperson 6. Public employee 3. House wife 7. Others (specify) _____ 4. Daily laborer
12	Occupation of the husband	1. Farmer 4. Daily laborer 2. Merchant/tradesperson 5. Unemployed 3. Public employee 6. Others _____
13	Family's monthly income if possible	_____ Birr
14	Do you have a death certificate?	☐ Yes ☐No
	If Yes to Q14, ask to see the documents. Record important cause of death and identified problems _____	
IV. Pregnancy related questions		

1.	Number of pregnancies including those that ended in miscarriage and still births _____		
2.	Number of births, including that ended in Stilll births and early neonatal deaths _____		
3.	Number of living children _____		
4.	Duration of the index pregnancy in months_____		
5.	Has she ever attended antenatal care (ANC)	☐ Yes ☐No ☐Not known	
6.	If ANC, If YES, in what month of pregnancy was her first ANC visit?	_____	
7.	If yes to Q7, where did she receive ANC Services (Check all that apply)	☐ HP ☐ Public Hospital ☐ Public HC ☐ Private clinic or hospital (specify) _____	
8.	If she had ANC, Number of ANC visits?	_____	
9.	Do you know is she had any medical problems before she died? If yes, Check *ALL* that apply		

Condition	**Check if identified**	**If Yes, When was the condition identified?**
Malaria (fever, chills, rigors)	☐ Yes ☐No	
Tuberculosis (cough> 3 weeks, fever, night sweating, etc.)	☐ Yes ☐No	
HIV/AIDS	☐ Yes ☐No	
Anemia	☐ Yes ☐No	
Hypertension	☐ Yes ☐No	
Diabetes	☐ Yes ☐No	
Epilepsy	☐ Yes ☐No	
Others (Specify) _____	☐ Yes ☐No	

10.	. **Did she receive treatment for any of the conditions mentioned above?** *Specify Treatment provided for each condition (separating modern and traditional treatments) If NO treatment was provided, leave blank.*		
Disease		*Modern treatment*	*Traditional/cultural treatment*
Malaria (fever, chills, rigors)		☐ Yes ☐No	
Tuberculosis (cough> 3 weeks, fever, night sweating, etc.)		☐ Yes ☐No	
HIV/AIDS		☐ Yes ☐No	
Anemia		☐ Yes ☐No	
Hypertension		☐ Yes ☐No	
Diabetes		☐ Yes ☐No	
Epilepsy		☐ Yes ☐No	
Others (Specify) _____		☐ Yes ☐No	
11	If it was delivery/Abortion, who assisted the delivery/Abortion?	1. Family/elderly 3. HEWs 2. TBA 4. HCWs	
12	Mode of delivery	1.Vaginal delivery 2. Abdominal operated delivery(CS or hysterectomy)	
13	Date of delivery/abortion	_____	
14	Place of delivery/abortion	1. Home 2. On transit 3. H/post 4. H/center 5. Hospital 6.Clinic	
15	Were any of the following problems experienced *during pregnancy*? Tick *ALL* those that apply	1. Seizure/abnormal body movement 3. Fever 2. Bleeding 4. Other (specify) _____	
16	Did she seek care for the problems experienced?	Yes ☐ No ☐ If YES, briefly DESCRIBE _____	
17	Did she attend PNC or PAC?	1. Yes 3. Knot known 2. No 4. Not applicable	
18	If yes for PNC/PAC, number of visits	_____	
V. Community factors			
1	Number of days/hours she was sick before she died (*Number of hours and days - specify*) _____		
2	Problems before she died: Tick *ALL* that apply	☐ Vaginal bleeding ☐ Baby stuck/Prolonged labor ☐ Fits ☐ Other (specify ☐ Fever	

3	Was any care sought for the problem? If "No" to question number 3 go to number 9	☐ Yes ☐ No
4	If yes to Q3 above, how long after the problem/illness was detected was care sought? (*Number of hours and days - specify*) _____	
5	Where was care sought and obtained?	☐ Traditional Healer ☐ Health Centre ☐ Health Extension Worker ☐ Hospital ☐ Others (specify) _____
6	How long after seeking care did she arrive at a health facility? (*Number of hours and days - specify*) _____	
7	What mode of transport was used if care was obtained?	
8	For how long was the care given? (*Number of hours and days - specify*)	
9	If no to Q3 above, what was the main reason why care was not sought?	☐ Not knowing the impact of the illness ☐ Lack of transport ☐ Past good obstetric outcomes at home ☐ Lack of money ☐ No nearby health facility ☐ Others (Specify)
10	How long would it take to walk from this house to the nearest (*Number of hours and days - specify*	Health post _____ Hours/days Health center _____ Hours/days Hospital _____ Hours/days
11	If you want to go to health center or hospital, what mode of transport would you be able to use? (Tick *ALL* that apply)	☐ Rented /public transport ☐ Private car ☐ Ambulance ☐ Others (specify) _____

INSTRUCTION: This form should be stored with a copy of the relevant maternal death reporting format in a secured location (e.g. locked cupboard in HC manager's office)

Annex 5: Facility based abstraction form

I. Abstractor related Information		
Name of the abstractor:_____ Qualification of the Abstractor_____ Telephone number of the abstractor:_____ Date of abstraction:_____ Was the abstractor involved in the management of the case? 1. Yes 2. No		
II. Identification/ Back ground information		
No.	Question	Response
1	Medical Record Number of the deceased	
2	Age of deceased	
3	Date and time of death	Date _____ Time_____
4	Ethnicity	
5	When did the death occur?	1. In transit 2. While waiting for treatment 3. Following start of treatment
6	Place of usual residence	Woreda/sub-city_____ Kebele_____ Got_____ House number_____
7	Religion	1. Orthodox 3 Protestant 2. Muslim 4. Others (specify)------
8	Educational status of the deceased	1.Illiterate 2.No formal education, but can read and write 3. Grade completed _____ 4. Don't know
9	Marital status of the deceased	1. Single 3. Divorced 2. Married 4. Widowed
10	Level of education of the husband	1.Illiterate 2.No formal education, but can read and write 3. Grade completed _____ 4. Don't know
11	Occupation of the deceased	1. Farmer 5. Unemployed 2. Merchant/tradesperson 6. Public employee 3. House wife 7. Others (specify) _____ 4. Daily labourer
12	Occupation of the husband	1. Farmer 4. Daily labourer 2. Merchant/tradesperson 5. Public employee 3. Unemployed 6. Others _____
13	Monthly income if possible	_____birr
III. Obstetric characteristics		
1.	Gravidity	
2.	Parity	
3.	Number of living children	
4.	Attended ANC?	☐ Yes ☐No ☐Not known
5.	If yes, gestational age in months at the first visit	_____
6.	If yes for Q4, where is the ANC?	1. Health post 3. Hospital 2. Health center 4. Clinic
7.	If yes, number of visits	_____
8.	Basic package of services provided in ANC (Tick *ALL* that apply)	☐RPR ☐ BP measurement during the follow up ☐Hgb ☐Fefol supplementation ☐Blood group, ☐TT immunization ☐HIV status, ☐Other (Specify) _____ ☐U/A
9.	Problems or risk factors in the current pregnancy:	
I	***Pre-existing problems*** (Tick *ALL* that apply)	☐Hypertension ☐Cardiac problem ☐Anemia ☐Tuberculosis ☐Diabetes ☐Hepatitis ☐HIV positive ☐Other (Specify) _____ ☐Malaria

II	***Ante-natal/ intra-natal problems/risks*** (Tick *ALL* that apply)	☐Pre-eclampsia / eclampsia ☐Anemia ☐Placenta praevia ☐ Malaria ☐Previous Caesarean Section ☐UTI/pyelonephritis ☐Multiple gestation ☐Unintended pregnancy ☐Abnormal lie/presentation ☐Other (specify)
10	State of pregnancy at the time of death	1. Antepartum 4. Post abortion 2. Intra-partum 5. Ectopic 3. Postpartum
11	If delivered, what is the outcome?	1. Live birth 2. Stillbirth
12	Date of delivery	Date: _____
13	Place of delivery	1 Home 2. On transit 3. H/post 4. H/center 5. Hospital 6. Clinic
14	If she has delivered, what was the mode of delivery?	1. Spontaneous vaginal delivery, 2. Operative vaginal delivery (vacuum or forceps) 3. Destructive vaginal delivery for dead fetal outcome 4. Operative Abdominal delivery (caesarean section or Hysterectomy)
15	Gestational Age at the time of death in antepartum and /or intra-partum events (specify time period in months & weeks)	_____
16	If the death was post-partum or post-abortion, after how many days did the death occur?	Days
17.	Did she had Post natal or Post abortal care?	☐ Yes ☐No ☐Not known ☐ Not applicable
18.	If she had PNC/PAC, Number of Visits?	_____
IV. Relevant history of the deceased woman		
1	Date and time of admission	Date_____ Time_____
2	Day of admission	1. Working days 2. Weekends 3. Holiday
3	Main reason/symptom for admission	
4	Is it a referred case? *If "No" to question number 5 go to number 9*	☐ Yes ☐No
5	Referred from (Name of health facility)	
6	Reason for referral	
7	Comment on referral	• Accompanied by HCWs • Appropriate management
8	Summary of management at hospital	
9	Qualification of the most senior attending health professional(s)	
10	Primary cause of death	
11	Is this preventable death?	
12	If preventable maternal death, specify factors according to the three delay model	
I	Delay in seeking care	
II	Delay in reaching at right facility	
III	Delay within the facility (diagnostic and therapeutic)	

Annex 6: Maternal Death Reporting Format (MDRF)

(To be filled in 5 copies by the Health Centre/hospital. Send the rest of copies to the next level by keeping one copy)

I. Reporting Facility Information						
Reporting Health Facility name & type (H.C/Clinic Hosp): _____	Region: _____ Zone : _____ Woreda: _____ Date of Reporting DD/MM/YYYY ____/____/_____					
This MDRF is extracted from 1. Verbal autopsy (VA) 2. Facility based maternal death abstraction form (FBAF)						
II. Deceased Information						
Deceased ID(code): _____	Date of Death DD/MM/YYY ____/____/_____	Age at death: ___ Years				
Residence of deceased ☐Urban ☐Rural	Region_____ Zone_____ Woreda_____	Kebele _____				
Place of Death	1. At home 2. At health post 3. At health centre 4. At Hospital 5. On transit from home to health facility 6. On transit from health facility to health facility					
Marital status	1. Single 2. Married 3. Divorced 4. Widowed					
Religion: _____	Ethnicity :_____					
Level of Education	1. No Formal education 2. No formal education, but can read and write 3. Elementary school 4. High school 5. College and above 6. I do not know					
Gravidity _____	Parity_____					
Timing of death in relation to pregnancy	1= Antepartum	2= Intra-partum	3= Postpartum			
If the deaths occur in post-partum/post-abortion, timing of death?	1. 1st 24 hr. 2. 2nd and 3rd day 3. 4th -7th day 4. 8th -42 day					
III. Antenatal Care (ANC), Delivery and Postnatal care (PNC) / Post abortion care(PAC)						
Attended ANC?	1. Yes 2. No 3. Not known					
If yes, where is the ANC?	1. Health post 2. Health centre 3. Hospital 4. Other (specify) _____					
If yes for ANC, number of visits?	_____					
If yes, GA in months at the first ANC visit	_____					
If delivered, Mode of delivery?	1. Vaginal delivery 2. Abdominal operated delivery (CS or hysterectomy)					
Place of delivery or Abortion?	1 Home 2. On transit 3. H/post 4. H/center 5. Hospital 6. Clinic					
Date of delivery /Abortion	Date _____					
If it was delivery/Abortion, who assisted the delivery/Abortion?	1. Family/ 2. TBA elderly 3. HEWs 4. HCWs					
Attended PNC/PAC?	1. Yes 2. No 3. Not known 4. Not applicable					
If yes for PNC/PAC, number of visits?	_____					
IV. Cause of death						
Direct obstetric	1= haemorrhage	2= obstructed labour	3= HDP	4=abortion	5= sepsis	6. Others _____
Indirect obstetric	1=anaemia	2= malaria	3= HIV	4= TB	5. Others _____	
If delivered, what was the outcome?	1. Live birth	2. Stillbirth				
Is the death preventable?	1= Yes	2= No				
V. Contributory factors (Thick all that apply)						
Delay 1	☐ Traditional practices ☐Lack of decision to go to health facility ☐Family poverty ☐Delayed referral from home ☐Failure of recognition of the problem					
Delay 2	☐Delayed arrival to referred facility ☐Lack of transportation ☐Lack of roads ☐No facility within reasonable distance ☐Lack of money for transport					
Delay 3	☐Delayed arrival to next facility from another facility on referral ☐Delayed or lacking supplies and equipment(specify)_____ ☐Delayed management after admission ☐Human error or mismanagement					

Reported by: _____ Signature: _____ Seal

References

1. WHO: Trends in maternal mortality: 1990 to 2013. Estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division. In.; 2014.

2. Organization WH: MDSR Technical guidance: INFORMATION FOR ACTION TO PREVENT MATERNAL DEATH. In. Edited by WHO. Geneva. Switzerland: WHO Document Production Services; 2013.

3. Kasolo F, Roungou JB, Perry H (eds.): Technical guidelines for integrated disease surveillance and response in the African region, 2 edn. Brazzaville, Republic of Congo. Atlanta, Georgia, USA; 2010.

4. Hounton S, Bernis LD, Hussein J, Graham WJ, Danel I, Byass P, Mason EM: Towards elimination of maternal deaths: maternal deaths surveillance and response. *Reproductive Health* 2013, 10(1).

5. World Health Organization G, 2004: Beyond the Numbers Reviewing maternal deaths and complications to make pregnancy safer. In. Geneva: World Health Organization; 2004.

6. Kasolo F, Yoti Z, Bakyaita N, Gaturuku P, Katz R, Fischer JE, Perry HN: IDSR as a Platform for Implementing IHR in African Countries. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science* 2013, 11(3).

7. Institute EHaNR, Centre PHEM: Public health emergency management guidelines for Ethiopia. In. Addis Ababa. Ethiopia: Federal ministry of health of Ethiopia; 2012.

8. Ethiopia Demographic and Health Survey 2011. In. Edited by 2012 CSAEaII. Addis Ababa, Ethiopia. Calverton, Maryland, USA; 2012: 270-275.

9. Ethiopia Mini Demographic and Health Survey 2014. In. Edited by Agency CS, MOH. Addis Ababa, Ethiopia; 2014.

10. MOH: Maternal Death Surveillance and Response (MDSR) Technical Guideline(final draft). In. Edited by Ethiopia FDRo. Addis Ababa. Ethiopia: FMOH; 2014.

11. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller A-B, Daniels J, Gülmezoglu AM, Temmerman M, Alkema L: Global causes of maternal death: a WHO systematic analysis. *Lancet Glob Health 2014* 2014, 2:e323-333.