

Maternal Death Surveillance and Response:

National Report on MDSR Data from 2006-2007 EFY



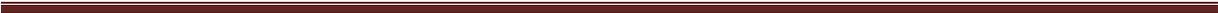
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The Federal Democratic Republic of Ethiopia
Ministry of Health



Saving the lives of mothers and babies in Africa



Foreword

The Ethiopian national Maternal Death Surveillance and Response (MDSR) system has been active since 2006 (Ethiopian calendar), with formal integration into Public Health Emergency Management (PHEM) data collection since 2007. Maternal death is one of the 14 immediately reportable conditions in Ethiopia. This reflects reflecting its prioritization at all levels of the health system and the political commitment to working towards preventing the majority of maternal deaths.

A core component of any MDSR system is regular review of aggregated data at district, regional and national levels in order to identify trends over time and ensure the most effective response strategies are put into place to address changes in risk factors. At national level, the focus is on assessing patterns of data across regions as well as across segments of the population so that broader social determinants of maternal mortality are considered in addition to its immediate medical causes.

This report is the first national MDSR report, and summarizes key findings from the first two years of the MDSR system, 2006-2007. All case-based reports following local review of maternal deaths have been collected into the national MDSR databases managed by EPHI for regular analysis. In future, annual reports will be produced to allow for year-to-year comparisons.

EPHI intends for this report to be shared across the health sector and beyond as a means to providing insight into the current profile of maternal mortality, and assist providers, public health professionals, government policy makers and implementing partners in evidence-based decision making for preventing future maternal deaths.



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Abbreviations

ANC	Antenatal Care
EPHI	Ethiopian Public Health Institute
FMOH	Federal Ministry of Health
HSTP	Health Sector Transformation Plan
ICD-10	The 10th International Classification of Diseases
IDSR	Integrated Disease Surveillance and Response
PHEM	Public Health Emergency Management
LARC	Long Acting Reversible Contraception
MDRF	Maternal Death Report Format
MDSR	Maternal Death Surveillance and Response
MMR	Maternal Mortality Ratio
MNCH	Maternal Neonatal and Child Health

Operational Definitions

Direct obstetric deaths are maternal deaths resulting from complications of pregnancy, labor or postpartum or from interventions omissions or incorrect treatment.

Indirect obstetric deaths are maternal deaths resulting from previously existing disease or newly developed medical conditions that were aggravated by the physiologic change of pregnancy.

Pregnancy related death is defined as all deaths of women during or within 42 days of termination of pregnancy regardless of cause. (ICD-10)

Maternal death is defined as the death of a woman while pregnant or within 42 days of the termination of pregnancy irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. (ICD – 10)

Maternal death surveillance and response (MDSR) has been defined as "a component of the health information system, which permits the identification, the notification, the quantification, and the determination of causes and avoidability of maternal deaths, for a defined time period and geographic location, with the goal of orienting the measures necessary for its prevention".

Executive summary

- This is the first National report of the Maternal Death Surveillance and Response system (MDSR). It presents summary of progress of system implementation, MDSR results, and recommendations.
- The information included in this report has been anonymised and is included to be used for learning purposes.
- Ethiopia introduced the MDSR system in Hamle 2006 and is based on the collection of data from both community and health facilities thereby engaging the community within the system.
- The MDSR system is in keeping with the Core Values of Transparency Accountability, Confidentiality, and Collaboration described in the nation's current HSTP.
- The integration of MDSR into the PHEM system is a prime example of collaboration within the health system.
- Early lessons from the MDSR experience in Ethiopia demonstrate that the information gained from MDSR gives communities and health workers real information about maternal death and encourages focused change to improve maternity services.
- Whilst the number of deaths represents the tip of the iceberg, the lessons learnt from the loss of these 387 women can be the stimulus to mounting a response to maternal mortality in Ethiopia.
- Hemorrhage is the major cause of death with 48% of the women dying of Obstetric Hemorrhage.
- Obstetric hemorrhage is avoidable.
- All health facilities should have trained staff and equipment to deal with Obstetric Hemorrhage.
- All women should be encouraged to use ANC and should be offered iron in pregnancy.
- The groups at highest risk of death from hemorrhage are women who have 4 or more children and therefore Family planning with LARC or permanent methods should be strongly promoted for these women.

Background

Hemorrhage, hypertension in pregnancy, abortion and sepsis are the leading causes of maternal deaths, which can only be averted through skilled institutional care. Maternal health is among the top priority programs of the health system in Ethiopia. The FMOH has given due emphasis in its Health Sector Transformation Plan (HSTP) so far considering the high burden of the problem and its impact in the overall development of the nation.

Considering the importance of evidences for improved maternal health program management and in implementing appropriate maternal health interventions FMOH introduced the national Maternal Death Surveillance and Review (MDSR) in Hamle 2006 (Ethiopian Calendar). The objective of MDSR is to prevent future similar maternal deaths by responding to its causes and contributing factors, and count every maternal death at national and all subnational levels.

The aim of this report, which is such first such report for the country, is to summarize the status of MDSR system and the maternal deaths in Ethiopia reported to the National database till the end of Sene 2007 E.C. and serve as a baseline for future similar reports.

Introduction

The death of a mother is a tragedy that has an immense impact on the wellbeing of her family. The survival and development of her children, especially infants, may be adversely affected. Each mother's death diminishes the society at large. Yet, nearly all of these deaths are preventable and should 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 country's maternal mortality ratio 420/100,000 live births and contributing nearly 4% to the global maternal death burden [1]. However this maternal mortality report is generated in the absence of civil vital registration and it lacks precision as it is an estimate with very 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 needed to stimulate and guide actions 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 the resulting information to those who need them for action. Surveillance is also essential for planning, implementation, and evaluation of public health practice [2-4].

MDSR 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 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 functioning MDSR system stresses that maternal deaths should be incorporated in the existing system of notifiable disease reporting to ensure timely notification. MDSR also stresses the need to collect data on all maternal deaths that occurred in both facilities and 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 system (IDSR) is one of the systems where MDSR can be integrated by explicitly building upon existing processes and guidelines and making specific recommendations for action. It is critical not to create a parallel system, but one which integrates with existing mechanisms of reporting at country level and that supports IDSR would be preferable to initiating a duplicate system for MDSR. [2-4, 6]

IDSR promotes the 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, and by doing so it takes advantage of similar surveillance functions, skills, resources and target populations of other programs.

Summary of Maternal deaths-Case based report 2006 & 2007 EFY

- This is a first national Maternal Death Surveillance and Response (MDSR) report in Ethiopia
- It covers the period of 2006 EFY (Nov-June) & 2007 EFY (July – June) (18 months)
- It includes the MDSR implementation status and inputs made by different stakeholders
- It Includes a total of 387 maternal death case based reports forwarded to EPHI MDSR data base
- A total of 98 and 289 Maternal deaths reviewed and reported in 2006 and 2007 EFY respectively
- The data come from 5 Regions (Amhara, Oromiya, Tigray, SNNP & Harari) and two city administrations (Addis Ababa & Dire Dawa)
- A total of 37 zones and sub-cities are included as reporting zones in those reporting regions
- The majority of maternal deaths investigated are extracted from Verbal autopsies.

MDSR implementation in Ethiopia

Prior to the MDSR's launch, a national MDSR advisory group was established and national MDSR guidance and training materials for health workers were adapted from WHO guidelines and other standard international guidelines taking into consideration country context.

Initially implementation started in a phased approach after provision of Training of Trainers and rollout trainings, availing tools in local language, and technical support in 5 regions and two city administrations (Oromia, Amhara, Tigray, SNNP, Hareri regions and Addis Ababa and Dire Dawa city administrations.)



Figure 1 – Map showing the regions of Ethiopia where MDSR is launched

Appropriate trainings were given to woreda and facility maternal and child health focal persons.

Regional, zonal/woreda and facility based MDSR review committees were established and technical assistance and mentorship were provided onsite to insure the initiative is implemented according to the guidelines. Qualified professionals were deployed to provide the technical assistance for each of the major regions. Table 1 summarizes the number of health care workers trained by region.

Table 1 – Number of MNCH personnel trained on MDSR by region until Sene 2007

S.N	Regions	Number of districts	Number of health facilities	Total number trained
1	Addis Ababa	10 sub cities	71	224
2	Amhara	19	102	352
3	Oromiya	20	106	637
4	SNNPR	11	62	517
5	Harrari	9	10	84
6	Diredawa		17	81
7	Tigray	8	36	189
	Total			2084

MDSR was later integrated into the PHEM system overseen by the Ethiopian Public Health Institute (EPHI). A MDSR/PHEM integration manual was developed, TOT for regional and zonal PHEM officers was provided, and additional MDSR tools were developed, printed and distributed to all sites. In addition, electronic data management for MDSR weekly notification and case based reviews was introduced. Table 2 summarizes the number of PHEM officers trained by region during the reporting period.

Table 2 - Number of PHEM officers trained on MDSR/PHEM integration by region until Sene 2007

S.N	Region	Number trained
1	AAbaba	14
2	Afar	37
3	Amhara	18
4	BSGumuz	21
5	DDawa	45
6	Gambella	14
7	Harari	41
8	Oromia	30
9	SNNPR	17
10	Tigray	57
	Total	230

The surveillance activities were implemented in all regions and all had had started reporting by the end of 2007 EFY. After the integration of MDSR in to PHEM system, weekly MD notification have been reported to national level starting from Hamle 2006 (2007 EFY). Maternal death reviews were being reported starting from Hidare 2006. Table 3 summarizes the weekly notifications reported by region during the reporting period.

Table 3 - Maternal Death notifications from Hamle 2006 - Sene 2007

S.No	Name of Region	# of Maternal Deaths Notified Weekly
1	Addis Ababa	4
2	Afar	3
3	Amhara	59
4	Benishangul-Gumuz	0
5	Dire Dawa	11
6	Gambella	1
7	Harari	5
8	Oromia	162
9	SNNPR	5
10	Somali	2
11	Tigray	13
	Grand Total	265

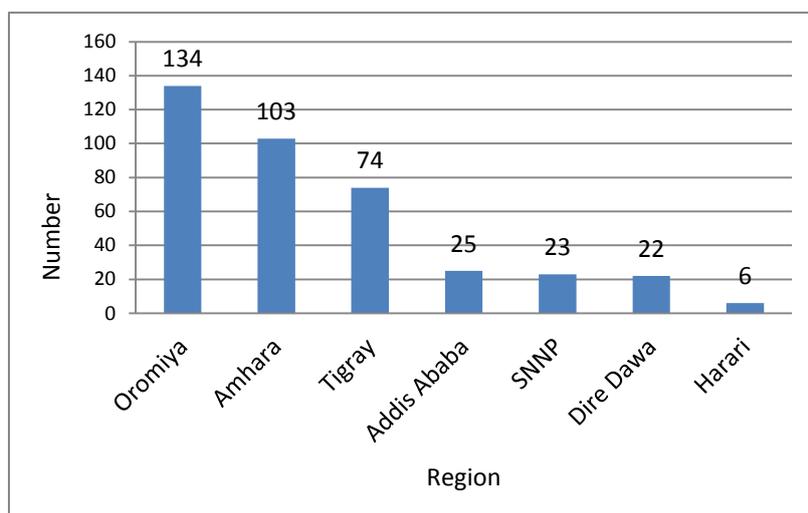
Following weekly reports through the PHEM system, maternal deaths should be investigated further through Verbal Autopsy and then reviewed at health center level. During the review, a case-based Maternal Death Reporting Form (MDRF) is completed, summarizing key information extracted from the Verbal Autopsy and recording the review committee's assessment of direct and indirect causes of death, whether the death was preventable, and primary contributing factors. Figure 2 shows the number of reported case based maternal deaths by region in the reporting period, demonstrating that most deaths reported through the PHEM system go on to be reviewed and summarized.

Numbers of reported deaths differ across the regions. This reflects their different population sizes and cannot be used as an indicator of MDSR implementation performance per se. However, consideration of population size and the number of maternal deaths that might be expected based on estimated MMR does suggest that reporting is more comprehensive in some areas compared to others. During the initial phase of MDSR, these higher performing areas tend to be those where

training was completed early on and intensive on-the-job support provided to help set up and strengthen the new system.

At national level, it is notable that by the end of this first reporting period all regions have started reviewing and reporting maternal deaths. Ongoing support to strengthen and sustain the system into the future remains critical.

Figure 2 – Number of Maternal Deaths reviewed and reported during the reporting period by region



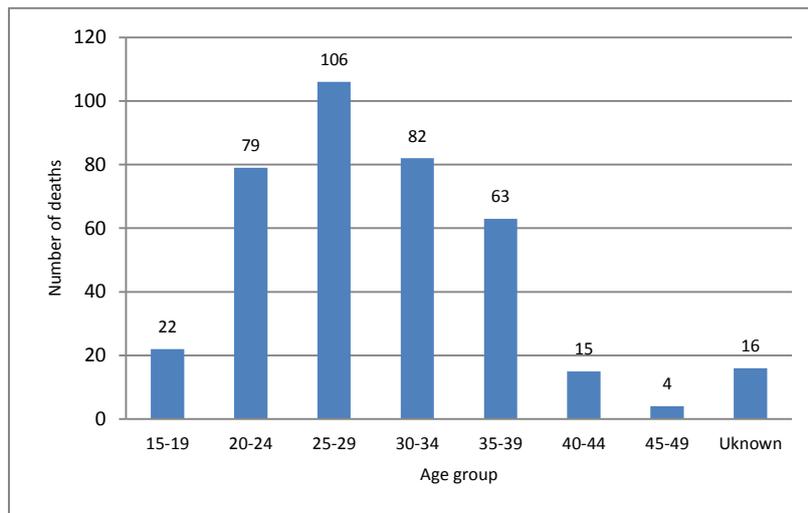
Socio-demographic characteristics of case based Maternal Deaths reviewed and reported during the reporting period

Maternal deaths by age

Patterns of maternal death by age will follow the distribution of pregnancies in the population, usually peaking in the 20-24 and 25-29 age groups. Thus it is to be expected that women aged 20-34 years accounted for more than two-thirds of all deaths. The highest number of maternal deaths (106), representing 27.4% of reviewed deaths occurred in the 25-29 age groups.

Risk of maternal death is known to increase with age, however, and the Ethiopian data show no exception. Among reported deaths, 82 occurred to women aged 35 and older, which is 21.2% of those deaths for which age was recorded. This is a high proportion considering lower childbearing at these ages, reflecting heightened risk for pregnancy in these age groups.

Figure 3 - Age Group of Maternal Deaths Reviewed and Reported



Marital status and Education

The vast majority of reviewed maternal deaths were reported to occur to married women (90%) as illustrated in Figure 4. A majority (69%) were also illiterate (Figure 5). These socio-demographic characteristics are broadly in keeping with population trends, although low education does appear to be highly prevalent among maternal deaths. Low education is likely to indicate a complex mix of relevant contributing factors including: lower awareness of risk factors in pregnancy and use of medical facilities, higher parity, rural/remote location, poverty and lower decision-making among women.

Figure 4 - Marital status of maternal deaths reviewed and reported

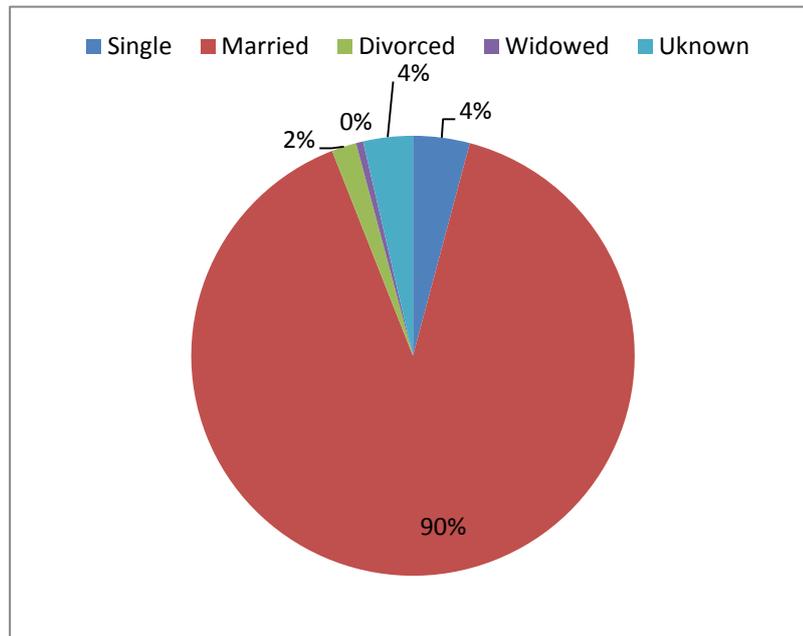
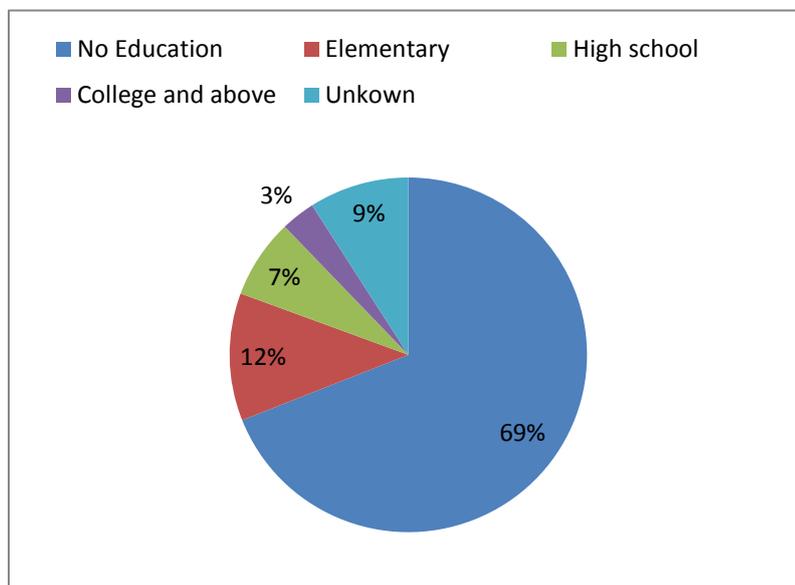


Figure 5 - Educational status of maternal deaths reviewed and reported

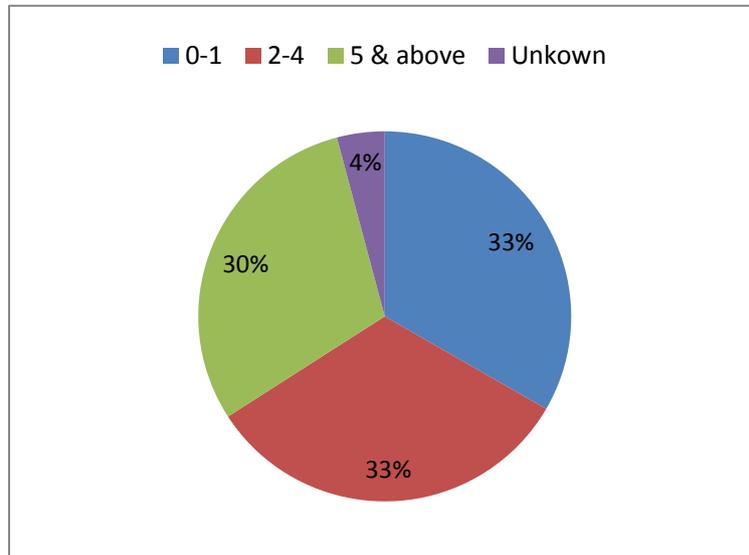


Parity

Although maternal deaths were observed uniformly distributed across parity, the data clearly indicate heightened risk among multiparous women in their fifth pregnancy and above. Grand multiparas account for nearly one third of all reported maternal deaths, although they make up a significantly smaller proportion of pregnancies and deliveries.

As with increased age (which is often confounded with parity, as by definition women get older as their parity rises), the data highlight the disproportionate burden of maternal death among high parity women.

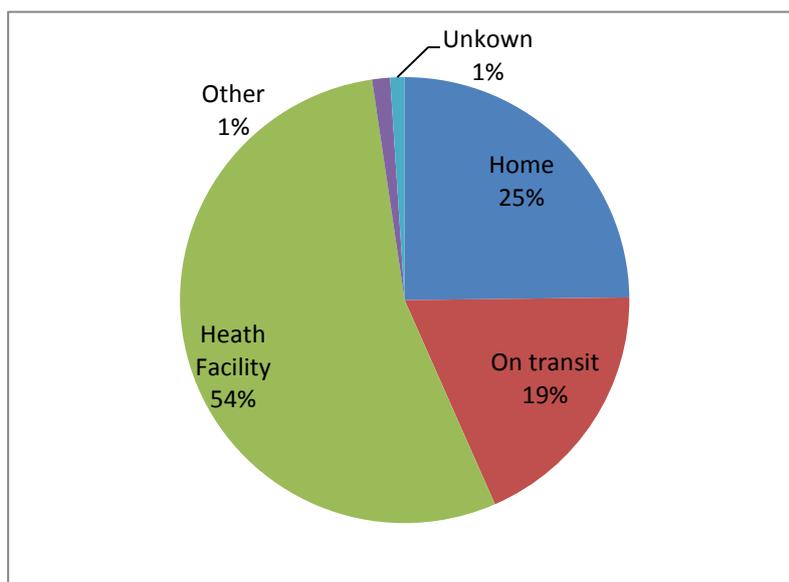
Figure 6 - Parity of maternal deaths reviewed and reported



Place of death

Over half of the reviewed deaths occurred in health facilities (54%) while 25% and 19% died at home and in transit respectively. In the early phases of MDSR implementation, data collection is more easily conducted at health facilities, particularly where a surveillance officer is active. Furthermore, women who became critically ill at home or in transit are likely to die on arrival in a facility, especially if there have been delays in identifying the severity of the woman's condition or reaching a facility. Thus the fact that a majority of the deaths occurred within facilities is partly an artifact of data quality and timing of transport of emergencies, rather than evidence of mismanagement in the facilities (which will be discussed further under Delays).

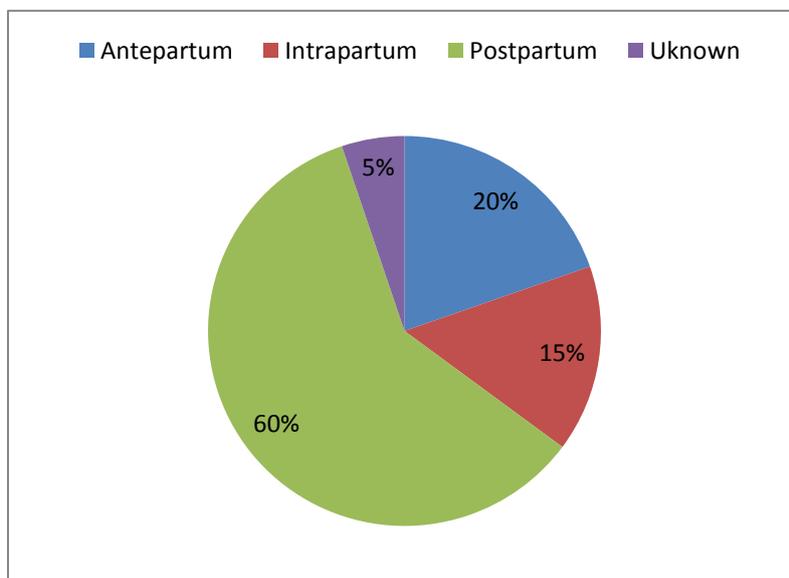
Figure 7 – Place of death of maternal deaths reviewed and reported



Timing of death

Most of the maternal deaths, 60% of them, died during the postpartum period. While 20% and 15% of them died in the antepartum and intrapartum period.

Figure 8 - Timing of maternal death in relation to pregnancy of maternal deaths reported and reviewed

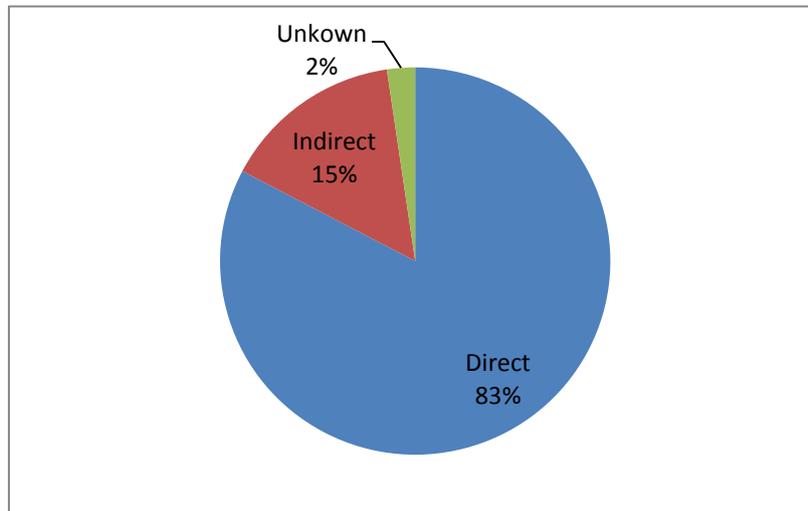


Causes of Maternal Deaths

Of the total case based maternal death reviews reported during the reporting period, the cause of death for **320 (83%)** of mothers was attributed to direct causes while in **58 (15%)** and **9 (2%)** of maternal deaths, the cause was recorded as indirect only and unknown respectively. Where the

MDRF listed both a direct and indirect cause of death, they have been counted as dying from the direct cause, in keeping with international best practice. Analysis has been conducted on both direct and indirect causes, however, as both are important to understanding patterns of maternal death and potentially avoidable factors.

Figure 9 – Causes of maternal death of maternal deaths reported and reviewed



Among the 83% of reviewed cases in which a direct cause was recorded, 70 (22%) of them also had an indirect cause listed on the MDRF. Thus in total, a direct cause was provided for 320 deaths (83%) and an indirect cause for 128 (31%). However, review committees are not yet familiar enough with reporting forms to be sure they are accurately identifying both direct and indirect causes accurately; it is quite likely that indirect causes implicated in many deaths have not been provided on the MDRF. Indeed, no direct cause of death or “cause of death unknown” were listed on 67 (17.3%) of all MDRFs. Table 4 provides a summary of the distribution of Direct and Indirect causes, and the number of each.

Table 4 – Proportional of maternal deaths with direct and indirect causes

Indirect Cause			Direct Cause		
No Indirect cause of Death attributed	250	64.6%	No direct cause of Death attributed	58	15.0%
One Indirect cause attributed as a cause	117	30.2%	One direct cause attributed as a cause	302	78.0%
More than one Indirect cause attributed as a cause	11	2.8%	More than one direct cause attributed as a cause	18	4.7%
Unknown	9	2.3%	Unknown	9	2.3%
Total	387	100.0%	Total	387	100.0%

Direct Causes of Maternal Death

Hemorrhage was by far the most common direct cause of maternal death accounting for 58.0% of all direct causes and 50.6% of all case based maternal death reviews. Hypertensive diseases related to pregnancy is also among the top killers accounting for 12.1% of all direct causes of maternal death and 10.6% of all case based maternal death reviews reported. Sepsis and obstructed labor contributed for 10.1% and 7.7% of all direct causes of maternal death

Table 5 summarizes the frequency of direct maternal causes of death.

Table 5 – Distribution of direct causes

Table: Direct maternal causes of death classifications			
Direct causes	Frequency	Percent from Direct causes	Percent from all maternal deaths (n=387**)
Hemorrhage	196	58.0%	50.6%
HDP	41	12.1%	10.6%
Sepsis	34	10.1%	8.8%
Obstructed labor	26	7.7%	6.7%
Abortion	9	2.7%	2.3%
Direct Others	32	9.5%	8.3%
Total	338	100.0%	N/A

** **Note:** Proportions of total maternal deaths do not add up to 100% as in 81 cases more than one cause of death was recorded.

Indirect Causes of Maternal Death

Anemia was by far the most common indirect cause of maternal death accounting for 51.8% of all indirect causes and 18.6% of all case based maternal death reviews reported.

Table 6 summarizes the frequency of indirect maternal causes of death.

Table 6 – Distribution of indirect causes of death

Indirect causes	Frequency	Percent from indirect causes	Percent from all maternal deaths (n=387)**
Anemia	72	51.8%	18.6%
Others Indirect	55	39.6%	14.2%
Malaria	7	5.0%	1.8%
HIV	4	2.9%	1.0%
TB	1	0.7%	0.3%
Total	139	100.0%	N/A

** **Note:** Proportions of total maternal deaths do not add up to 100% as more than one indirect cause of death can be recorded.

Contributory factors: The Delay Model

Delays in seeking, accessing and receiving care during obstetric emergencies are usually classified into three categories. Delay 1 refers to the time from the start of a woman's illness to the time the problem is recognized as requiring care; Delay 2 refers to the time from acknowledging a problem to reaching an appropriate health facility; and Delay 3 refers to the time from arrival at a care facility to receiving the requisite treatment.

The review committee is tasked with identifying which of these delays appear to have occurred during the course of the woman's illness and death; more than one delay is likely as many deaths result from a chronological series of contributing factors that can compound each other.

Among the 387 reviewed deaths, Delay 1 was reported for 287 (65.5%), Delay 2 for 150(38.3%) and Delay 3 for 141 (36.4%) cases. Note that while Delay 1 and Delay 2 can potentially occur for any death (due to poor recognition of the problem and difficulties in accessing a facility), Delay 3 can only be recorded for deaths while (or after) the woman has reached a facility and thus by definition will occur among a smaller proportion of all reported deaths.

In roughly half of the cases 199 (51%), only one delay factor was recorded on the MDRF as a contributory factor, of which 129 (33.3%) were Delay 1 only, 16(4.1%) Delay 2 only and 54 (14.0%) delay 3 only. In the remaining 49% of case based maternal death reviews reported, more than one delay factor was attributed as a contributory factor to the death.

Figure 10- Contributing factors to maternal deaths reviewed and reported during the reporting period according to the three delays model

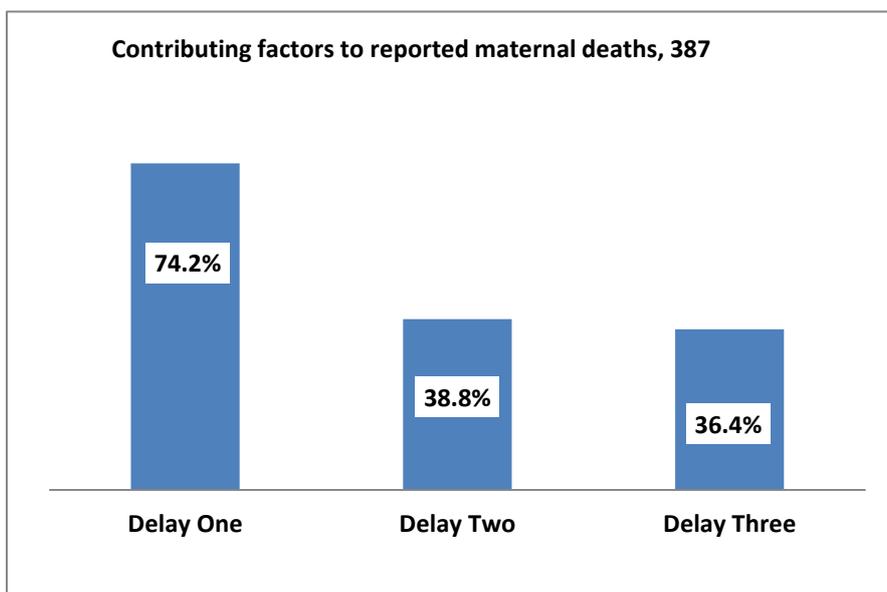
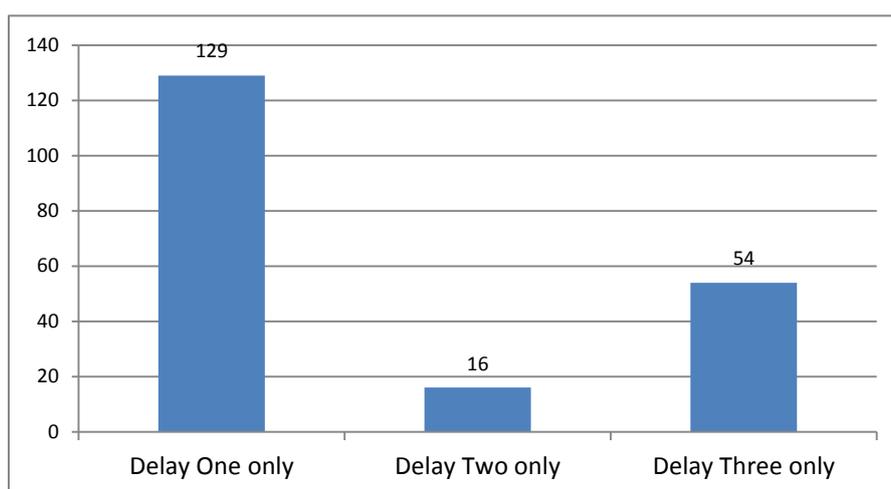


Figure 11 – Maternal deaths reviewed and reported who have only one delay factor as a contributing factor

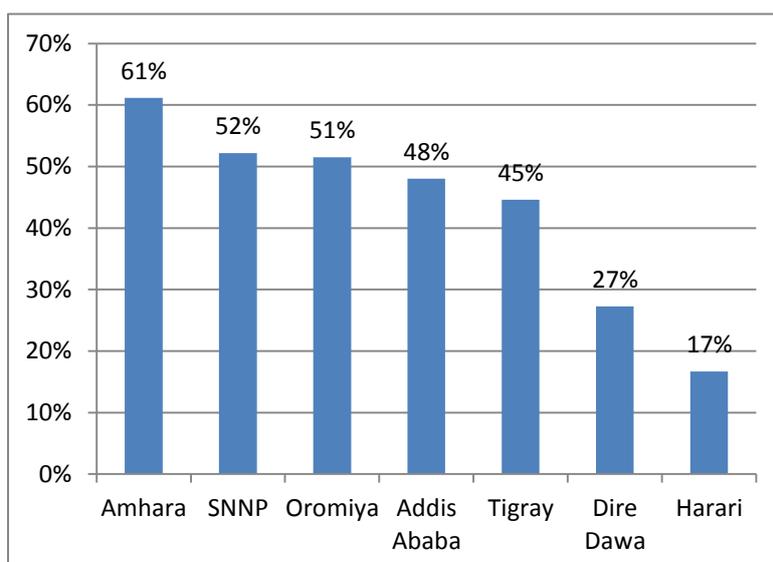


Top cause of death – Hemorrhage

Proportion of Deaths caused by Hemorrhage by region

Hemorrhage was by far the commonest cause of death in all regions ranging from 17% to 61%.

Figure 12 – Proportion of deaths caused by hemorrhage by region

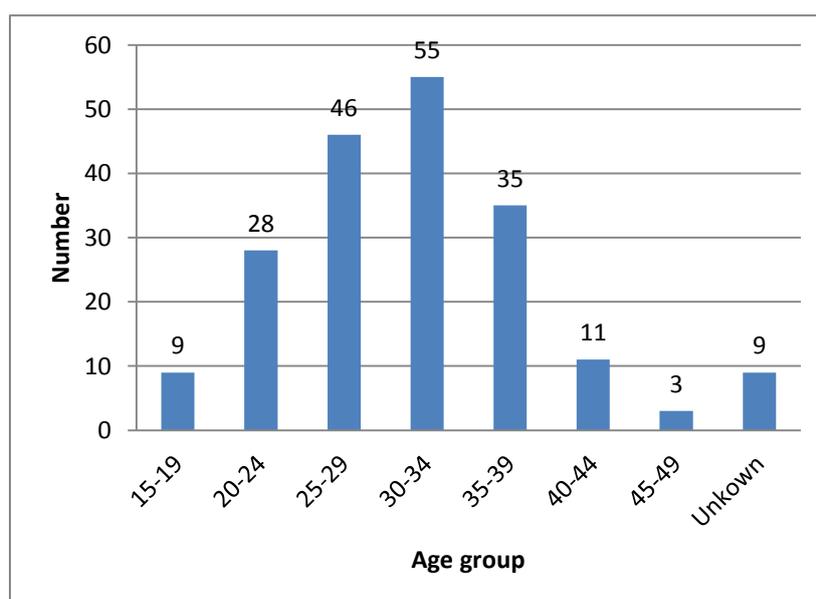


Background characteristics of maternal deaths caused by hemorrhage

Age and hemorrhage

The age group of mothers who died of hemorrhage follows a similarly trend to the overall cases, but again showing higher risk for women at the higher age brackets, namely among women aged 35 and older (Figure 13). For example, among deaths for which an age was provided, 29.6% of all deaths attributed to hemorrhage occurred among women aged 35 and older and this rises to 57.7% if women from age 30 are considered. Pregnancy at higher ages is thus a clear risk for hemorrhage in Ethiopia, and this is also likely to reflect the risk of higher parity.

Figure 13 – Age group of mothers who died of hemorrhage



Marital status, Education and Hemorrhage

Ninety percent of the mothers who died of hemorrhage were married and 75.0% of them were illiterate. Figure 14 & 15 illustrate the marital and educational status of women who died of hemorrhage, which does not differ significantly from the overall pattern of maternal mortality.

Figure 14 – Marital status of women who died of hemorrhage

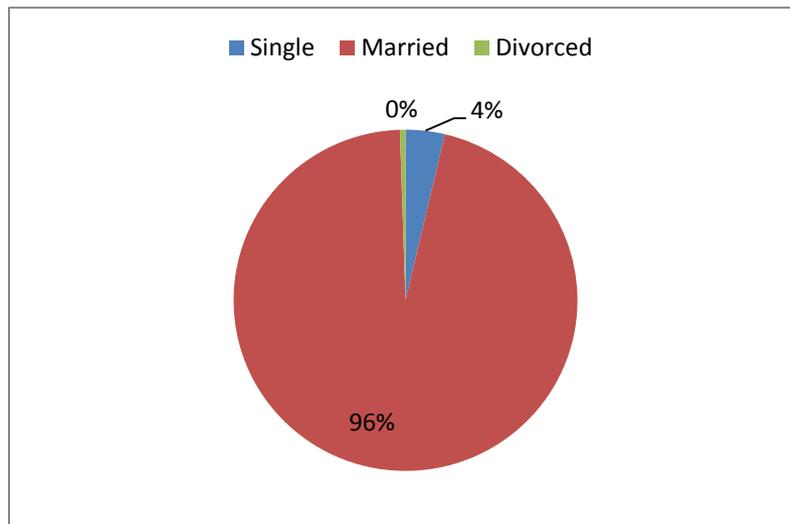
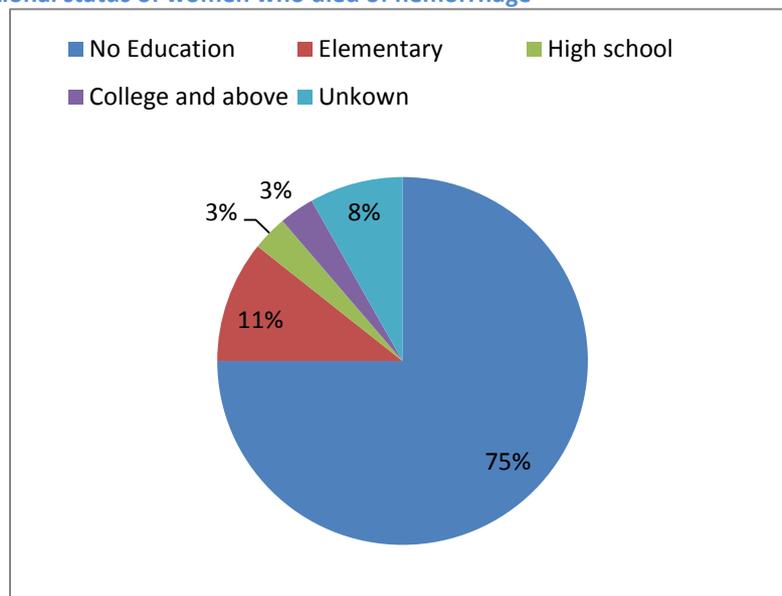


Figure 15 – Educational status of women who died of hemorrhage

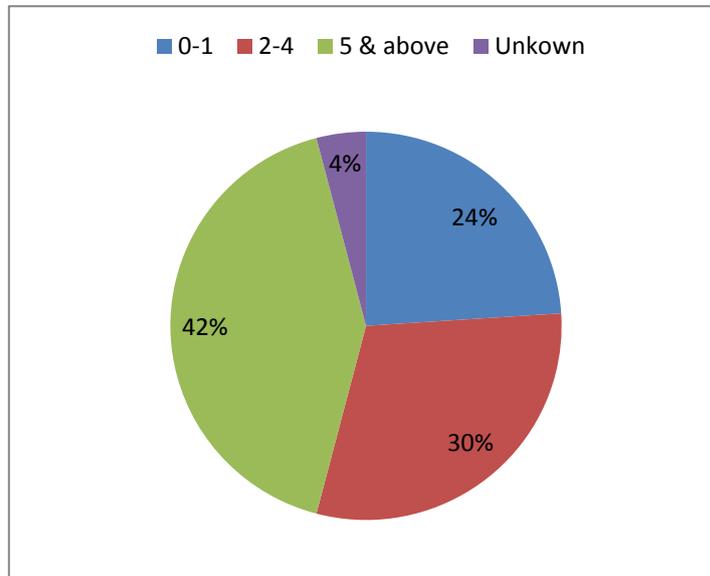


Parity and Hemorrhage

The association between increasing parity and increased risk of death through hemorrhage is well illustrated by the data. Hemorrhage was more common in grand multiparas accounting for 45.5% of

all the hemorrhage deaths. The proportion of hemorrhage deaths with 0-1 parity and 2-4 parity were 24% and 31% respectively.

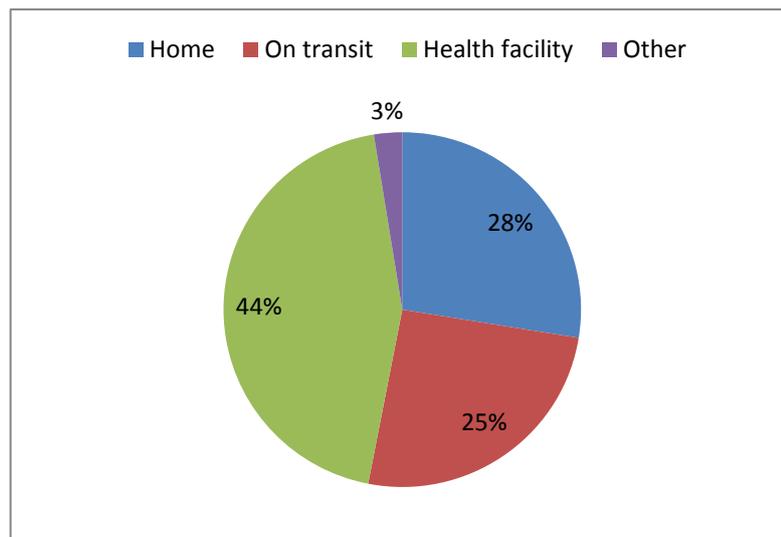
Figure 16 – Parity of women who died of hemorrhage



Place of death and hemorrhage

Most the mothers who died of hemorrhage, 44% died at health facility. While 28% and 25% died at home and in transit respectively. A higher proportion of women who died of hemorrhage died at home compared to the overall trend by place of death, likely reflecting the rapidity at which hemorrhage can lead to death and the difficulties in obtaining care if the hemorrhage is recognized late, transport is difficult to obtain, and/ or distance to facilities is far.

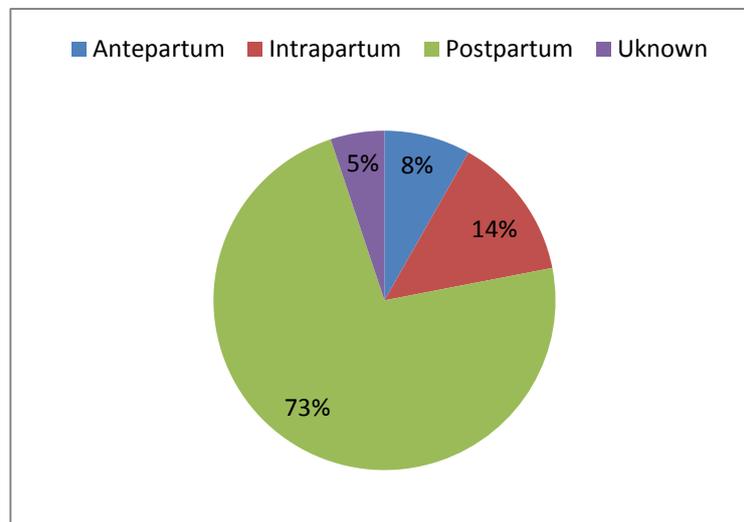
Figure 17 – Place of death of women who died of hemorrhage



Timing of death and Hemorrhage

The vast majority of hemorrhages, 73% of them, occurred during the postpartum period, while 14% and 8% were intrapartum and antepartum.

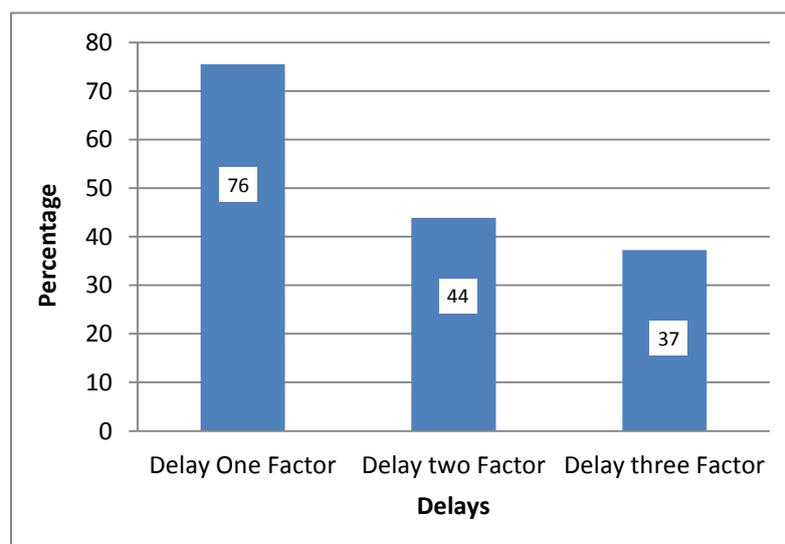
Figure 18 – Timing of death of women who died of hemorrhage in relation to pregnancy



The 3 Delays and Hemorrhage

As might be expected, Delay 1 is implicated in most of the cases of hemorrhage related deaths. However, the distribution of the delays recorded for deaths in cases of hemorrhage does not differ much from the distribution of the 3 delays across all reviewed maternal deaths.

Figure 19 – Contributory factors for women who died of hemorrhage



Limitations and Challenges of current MDSR system in Ethiopia

Limitations:

- Low identification of suspected cases both in facilities and in communities (3% of expected 5124 suspected cases per year)
- Low completeness of notification report by zone (50% of the zones achieved below target of 80% for notification of suspected cases)
- Low conduction of verbal autopsy and Reviewing of cases (only 45 of notified suspected cases reviewed)
- Poor functionality of the review committees at facilities and Zonal health
- Underreporting of Maternal deaths (3% of Expected maternal deaths were and reported)
- Low ownership of the program at all levels

Key challenges:

At community level

- Tendency to hide any information about abortion, pregnancy outside marriage
- Low awareness at community side about what and when to report
- Fear of blame among Health Extension workers
- Large catchment area to cover for HEWS

At Health Facility (Health Centres and hospitals)

- Absent/ Poorly functioning Review committees
- Low ownership and leadership among the managers
- Delay in doing verbal autopsy , reviewing cases and reporting
- Sending case based report without reviewing
- Tendency to hide cases because of fear of blame
- Poor coordination of activities
- Shortage of resources for implementing responses
- Poor recording and documentation of relevant histories, Lab. Results and /missing of charts National and Regional programme
- Irregular meeting of TWG
- Shortage of budget for system scale up
- Low supportive supervision at all levels
- Absent or Poorly functioning TWG at ZHOs
- Poor ownership of the program
- Low support and follow up for Health Centres
- Weak coordination of different activities at woreda level

Recommendations

Recommendations for further Implementation of MDSR

Strengthening and scale up of Implementation is required in all regions and all zones.

As the MDSR system embeds with in the PHEM system, communication between levels of the health system and also between MNCH and Surveillance teams will improve. This is in keeping with the core value of collaboration as described in the HSTP. This integration needs to be actively strengthened by the chair of the MDSR committee at Regional and zonal levels.

MNCH and PHEM Supportive Supervision at all levels should now include MDSR. Where senior MNCH and Surveillance staff at Regional and Zonal level are unfamiliar with the MDSR system they should seek support from trained staff and familiarize themselves with the National Guidance document available on the FMOH website.

Zones , woredas and facilities that are silent should be actively identified and investigated to explore their ' silence'. Regular performance monitoring at Regional and zonal level is required.

At hospital facilities, surveillance officers should regularly review all deaths in women of reproductive age to identify all cases of maternal death regardless of the location of the death.

Every opportunity to strengthen partnerships with all stakeholders working on safe motherhood should be taken. MDSR is an integral part of safe motherhood.

A Regional annual meeting to feedback to communities and facilities and show case good practice should be planned by the Regional MNCH team.

Recommendations in response to maternal death data

MDSR data should be used at every opportunity to inform the community, health workers and decision makers to improve the health status of the population of Ethiopia. MDSR provides real time local data which is a powerful tool of communication in improving health seeking behavior.

Early lessons from the MDSR experience in Ethiopia demonstrate that the information gained from MDSR gives communities and health workers real information about maternal death and encourages focused change to improve maternity services.

All health facilities should be active participants in the MDSR system with an MDSR committee which includes the facility surveillance officer.

Haemorrhage is the major cause of death with 50.6% of the women dying of Obstetric haemorrhage. Obstetric haemorrhage is avoidable.

All health facilities should have trained staff and equipment to deal with Obstetric haemorrhage.

All women should be encouraged to use ANC and should be offered Iron in pregnancy.

The group at highest risk of death from haemorrhage are women who have 4 or more children and therefore family planning with LARC or permanent methods in should be strongly promoted for these women.

References

1. WHO: Trends in maternal mortality: 1990 to 2013. Estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division; 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, Rongou JB, Perry H (eds.): Technical guidelines for integrated disease surveillance and response in the African region, 2 edn. Brazzaville, Republic of Congo and 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, Bakayita 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 EHNR, 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 CSAEall. Addis Ababa, Ethiopia and 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.