**Republic of Yemen**

**Ministry of Public Health and Population**

# *Maternal Mortality Audit*

## *National Guidelines*

***November 2012***

This guidelines was prepared by the kind support of the European Union through the Technical assistance for the Reproductive Health & Population Programme (RHPP)

## Introduction
## By His Excellency the Minister of Public Health and Population, Professor Dr Ahmad Qasem Al-Ansi

Improving health is the number one target that defines the health system identity. In order to achieve better health and in conclusion of a lot of efforts made by a number of local and international development partners as well as by health providers during the last years, I now have the privilege of introducing this guidelines and manual to serve all those who are involved in reproductive health (staff, participants, workers, etc).

The MOHP aims out of this to standardize the concepts and procedures of provision of health services, achieve quality in performance and avoid conflicts and misunderstandings in the practice of
RH services. These tools also facilitate planning, implementation and evaluation according to MoPHP directions and strategies to enhance the health services system.

I call upon all who work in the health system, planners, fund providers, technical support personnel and health service providers in the public and private sectors to use this manual as a guide in their related activities.

The MoPHP represented by the Population Sector will make this manual available and train trainers at the local and central levels.

I wish to express my appreciation to all who contributed to bringing this work to reality.

**Prof. Ahmad Qasem Al-Ansi**
Minister of Public Health and Population, Yemen

## Preface and Acknowledgement

Maternal health is one of the top health priorities that Ministry of Public Health and Population has put in its agenda. The National Strategy for Reproductive Health 2011 – 2015 identified the priorities for reproductive health; focusing on maternal and newborn health and family planning towards fostering the efforts to reduce maternal mortalities and newborns, and enhancing evidence based information and data on the causes and factors of maternal mortality which continue to burden the health of Yemeni mothers; aiming at improvement of health services' quality and tackling the obstacles constraining mothers from accessing healthcare service.

Maternal mortality audit is one of the useful approaches with high value both in developed and developing countries alike, in enhancing the information availability on high levels of maternal mortality; thus, guiding health investment targeting maternal and newborn health. Therefore, these national guidelines on maternal mortality audit were prepared in wide consultation with national experts including senior specialists from different disciplines: Gynaecology and Obstetrics, Anaesthesia, Academia, Public Health from several governorates; to all I extend my appreciation and recognition of their inputs during the fruitful discussions and sessions, and financed by the European Union.

I would like to take this opportunity to acknowledge and extend our indebtedness to the technical assistance experts: Dr. Rashad G. Sheikh (Senior Expert) and Dr. Lina Y. Amin; for their work during the mission to prepare the guidelines, leading the work groups in particular during the national workshop to finalise the guideline. I appreciate their high level of professionalism we witnessed during this work which is the base for future efforts to reduce maternal mortalities in Yemen. I also extend our gratitude to Prof. Tawfeek Albusaili; head of Gynaecology and Obstetric ward in Alsabeen Hospital for his review of the guidelines. Last but not least, our acknowledgment is extended also to the European Union for financing this work through the Reproductive Health and Population Programme.

Wishing all success to the implementation and use of these guidelines in the field in order to reach its objective; that is reducing maternal and newborn morbidity and mortality in Yemen.

**Dr. Nagiba Abdalla Abdulghani Alshawafi**

Deputy Minister of Population Sector - Ministry of Public Health & Population

## Abbreviations

| | |
|---|---|
| ANC | Antenatal Care |
| APH | Ante partum Haemorrhage |
| BEmOC | Basic Emergency Obstetric Care |
| CBMMA | Community Based Maternal Mortality Audit |
| CBVA | Community Based Verbal Autopsy |
| CEmOC | Comprehensive Emergency Obstetric Care |
| CMW | Community Midwife |
| CS | Caesarian Section |
| CSSW | Charitable Society and Social Welfare |
| CVA | Cerebrovascular Accident |
| DG | Director General |
| DHO | District Health Office |
| DIC | Disseminated intravascular coagulation |
| DP | Development Partner |
| EmOC | Emergency Obstetric & Neonatal Care |
| FBMMA | Facility Based Maternal Mortality Audit |
| GCG | Governorate's Core Group |
| GHO | Governorate Health Office |
| GP | General Practitioner |
| HDC | Health Development Council |
| HDC | Health Development Council |
| HMIS | Health Management Information System |
| Hrs | Hours |
| LA | Local Authority |
| LC | Local Councils |
| M&E | Monitoring and Evaluation |
| MDG | Millennium Development Goals |
| MMA | Maternal Mortality Audit |
| MMR | Maternal Mortality Rate |
| MoCSI | Ministry of Civil Services and Insurances |
| MoF | Ministry of Finance |

| | |
|---|---|
| MoLA | Ministry of Local Authority |
| MoLA | Ministry of Local Administration |
| MoPHP | Ministry of Public Health and Population |
| MoPIC | Ministry of Planning and International Cooperation |
| NTF | National Task Force |
| PPH | Postpartum Haemorrhage |
| PR | Primary Reporter |
| RH | Reproductive Health |
| RHD | Reproductive Health Director at GHO |
| RHO | Reproductive Health Officer |
| RHPP | Reproductive Health & Population Programme |
| RHTG | Reproductive Health Technical Group |
| TB | Tuberculosis |
| TBA | Traditional Birth Attendant |
| ToR | Terms of Reference |
| UNFPA | United Nation for Population Activities |
| UNICEF | The United Nations Children's Fund |
| WB | World Bank |
| WHO | World Health Organization |
| YFCA | Yemen Family Care Association |
| YMA | Yemen Midwives Association |

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# Introduction

Attaining the Millennium Development Goals has been challenging for many developing countries including Yemen. According to WHO, UNICEF, UNFPA and WB on Maternal mortality trends based on estimation from 1990 to 2008, Yemen is making progress. In spite of those obstacles there is a great support for maternal health, but still the MMR is one of the highest rates among the other developing countries.

Childbirth is a universally celebrated event, an occasion for gathering, enjoyment, happiness and gifts. Yet, for many thousands of women and families, in Yemen child bearing is experienced not as the joyful event as it should be, but as a private misery that may end in death.

What is a maternal death?

A maternal death is the death of a woman while pregnant or within 42 days of the end of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. It can be of one of the following types:

1. *Direct obstetric death* is a maternal death resulting from complications of the pregnancy, labour or puerperium or from interventions, omissions or incorrect treatment.
2. *Indirect obstetric death* is a maternal death resulting from previously existing disease or newly developed medical conditions that were aggravated by the physiologic nature of pregnancy.

Each maternal death has a story to tell and can provide indications on practical ways of addressing its causes and determinants. Therefore Maternal Mortality Audit allows exploring the factors contributing to persistence of mortalities of mothers. Although this audit process empowers local authorities to understand and take steps to improve maternal health, most of the countries with high maternal mortality have not fully instituted it including Yemen.

# Maternal Mortality in Yemen

Yemen population remained mostly in the rural areas with only 30% residing in urban areas, although the growth of the urban population is two times the growth of the rural one as the national reports indicate. In Yemen an estimated 4000,000 women of reproductive age almost a sixth of population. Of these, an approximate 365 maternal deaths per 100,000 live births and 37 per 1000 live birth newborn deaths occur yearly. Moreover, many more

women experience pregnancy and birth related complications and ill health. Therefore, maternal mortality and morbidity have immense impact on the lives of Yemeni women.

Yemeni women face a 1 in 90 lifetime risk of maternal death. UNICEF estimates that 470 women per 100,000 live births die from obstetric complications.[1] An estimated 82% of these deaths occur during delivery. Yemen's high maternal mortality rate is primarily due to a lack of skilled health care personnel for antenatal, delivery and postnatal care. In order to reduce the rate of maternal mortality and improve the overall health status of women, we should focus on recruiting and training midwives, especially in rural and underserved areas.

Maternal Mortality Rates have shown improvements over the last three decades. Despite the improvement in such indicator, there is still an urgent need to accelerate the decrease in MMR in order to achieve the MDG objective in reaching 88 death/100,000 live births by 2015 (or even 135 as per estimates in 2010)[2]. There are persistent problems, however, that need to be addressed if Yemen has to reach its objectives to meet the MDGs especially 4 and 5. These problems primarily concern family planning, skilled attendance at delivery and emergency obstetric and neonatal care[3].

Levels of maternal mortality across the governorates are not known, but believed to vary in particular between rural and urban regions. These variations might be due to discrepancy in underlying access to emergency obstetric care, antenatal care, anemia rates among women, education levels of women, and other factors.

Despite the attempts to pilot some approaches of MMA in the country there has been no systematic support and therefore these initiatives have disappeared prematurely. Evidence in Yemen shows that there is lack of mechanism in place to review maternal deaths, indicating the need to introduce a process whereby each death is reviewed to identify avoidable factors. The findings of the review process can then be used to determine interventions (e.g. staff training, strengthening the referral system) to improve the quality of care and reduce the risk of maternal death.

## Causes of Maternal Death

Causes of maternal deaths can be either ***obstetric*** (direct or indirect) or ***non-obstetric.***

### Direct obstetric Causes

[1] UNICEF, "At a Glance: Yemen," http://www.unicef.org/infobycountry/yemen_statistics.html
[2] Trends in Maternal Mortality:1990 to 2010, http://www.unfpa.org/webdav/site/global/shared/documents/publications/2012/Trends_in_maternal_mortality_A4-1.pdf
[3] Reproductive Health Strategy 2011-2015. MoPHP

Maternal deaths resulting from obstetric complications of the pregnant state (pregnancy, labour, and the puerperium), from interventions, omissions or incorrect treatment, or from a chain of events resulting from any of the above. The list of specific causes improves the degree of detail achieved.

Examples: Antepartum haemorrhage following placenta praevia, postpartum haemorrhage following prolonged labour, PPH following cervical tear, eclampsia, sepsis following prior foetal death[4]. See annex 8.

## Indirect obstetric Causes

Maternal deaths resulting from pre-existing disease or disease that developed during pregnancy and that was not due to direct obstetric causes but was aggravated by the physiological effects of pregnancy.

Indirect maternal deaths are relatively few in number. The classification should list the causes of importance according to the local epidemiology of diseases. The diseases representing relatively large proportions should be listed as such rather than hidden in a broader category.

Examples: Heart diseases, Hepatitis, malaria, TB, AIDS, tetanus[5]. See annex 8.

## Non-obstetric causes

Death of pregnant woman resulting from accidental or incidental causes. (Examples: Accident, assault, suicide, snake bite, burns). See annex 8.

# Causes of Maternal Mortality in Yemen

Small scale studies on the causes of maternal mortality in Yemen shows that the main causes are similar to that mostly occurring in other developing countries documented by World Health Organisation. In a study conducted in Sana'a major hospitals showed the following main maternal mortality causes:

1. Haemorrhage of late Pregnancy (APH & PPH)
2. Hypertensive diseases
3. Infections (sepsis)
4. Obstructed labour and rupture uterus
5. Embolism

[4] WHO
[5] WHO

6. Anesthesia related
7. Indirect causes

In Yemen, pregnancy and childbirth are “life-threatening events”. Maternal deaths account for 42% of all female deaths among women of reproductive age (15-49 years). It is the leading cause of death among women in that age group. Most maternal deaths occur between the third trimester and the first week after the end of pregnancy. Approximately 80% of maternal deaths are from direct causes, such as hemorrhaging (39%), obstructed labor (23%), infection (19%), and eclampsia (19%). Indirect causes account for the other 20%. Indirect causes are diseases that complicate, or are complicated by pregnancy, such as malaria, anemia, HIV/AIDS and cardiovascular disease. In addition, for every woman who dies due to childbirth complications, 20 more will suffer injuries, infections and disabilities.

## Maternal Mortality Audit

Maternal death audit is an in-depth systematic review of maternal deaths to delineate their underlying health, social and other contributory factors, and the lessons learned from such an audit are used in making recommendations to prevent similar future deaths.

It is not a process for apportioning blame or shame but exists to identify and learn lessons from the remediable factors that might save the lives of more mothers in future.

It is imperative to establish or strengthen maternal death audits in high maternal mortality settings, both to generate evidence for determining interventions and to provide the data needed to feed into the national civil registration system for the computing of MMR.

MMA provide evidence of where the main problems in overcoming maternal mortality and morbidity may lie; produce an analysis of what can be done in practical terms. Additionally it provides information that can be used in the development of programs and interventions to improve maternal health, reduce maternal morbidity, and highlight the key areas necessitating recommendations for health sector and community action as well as policy directions to improve the quality of care of women during pregnancy, delivery, and the puerperium.

MMA report’s discussions and review can increase awareness on maternal mortality mainly the preventable or avoidable factors and causes, at the community, healthcare system, and intersectoral (policy-making) levels. Advocacy and awareness can lead to changes in practice among the community and health providers, as well as lead to a reallocation of resources and funds to activities for decreasing maternal mortality and improving the quality of care.

### Rationale for MMA

There are two main encouraging reasons to establish MMA; the first: MMA provides information about avoidable factors that contribute to maternal death and guides actions that need to be taken at the community level, within the formal healthcare system, and at

the intersectoral level (i.e. in other governmental and social sectors) to prevent similar deaths in the future.

The second**:** MMA establishes the framework for an accurate assessment of the maternal mortality magnitude related to pregnancy. By having an accurate assessment of situation, policy and decision makers may be more compelled to give the problem the attention it deserves. Furthermore, evaluators will more accurately assess the effectiveness of interventions to decrease mortality rates at national and governorate levels. Therefore, MMA will aim to identify every maternal death in order to accurately monitor maternal mortality and the impact of interventions to reduce it.

## Purpose and objectives of these guidelines

The purpose of these guidelines are to participate in decreasing the maternal mortality and morbidity burden on Yemeni women at reproductive age and improve the quality of care provided to them at various levels. These guidelines are providing a framework for maternal mortality audit system in Yemen. With consistency of the audit and review process, data may be aggregated at district, governorates and national levels for data synthesis.

The objectives of the guidelines are:

1. To establish operational mechanisms/modalities for carrying out MMA at community and various health services' levels in both public and private sectors.
2. To guide the process of data collection and present tools for data/information collection and flow.
3. To develop systematic review process and corrective follow up measures.
4. To Guide the implementation, M&E and supervision of the MMA process at different levels of the health system.
5. To guide MMA team in undertaking of MMA, facilitate standardization and harmonization of the MMA process at community, facility, district and region levels.

**Key messages of MMA guidelines**

- Avoiding maternal death and improving quality of care is possible, even in resource constrained settings.
- Obtaining the right kind of information to guide action is vital.
- Every maternal death is a tragedy and should be a notifiable event that is reviewed, discussed and leads to corrective actions to address the problems encountered.
- Understanding the underlying factors leading to the deaths is essential to preventing future mortality.
- Data collection must be linked to action. A commitment to act upon findings is a fundamental prerequisite for success.
- As a starting point, all maternal deaths in health facilities and communities should be identified, reported, reviewed and responded to with measures aiming at preventing future deaths.
- While response is critical and the primary purpose of MMA, there is also a need to improve the measurement of maternal mortality by working to identify all deaths in a given area to know if our actions are truly effective.

## Importance of Maternal Mortality Audit

MMA is an important strategy to improve the quality of obstetric care and reduce maternal mortality and morbidity. The importance of MMA lies in the fact that it provides detailed information on various factors at community, facility, district, governorate and national level that are contributing to the high level of maternal mortalities. Analysis of these mortalities can identify the delays that contribute to maternal deaths at different levels and the information used to adopt actions to fill the gaps in service. MMA has been conducted as a recognized intervention for the last few years by some developing countries in Asia, Africa and South America.

MMA would help in identifying the gaps in the existing health care delivery systems, prioritise and plan for intervention strategies and to redesign health services.

MMA should provide information that can be used in the development of programmes and interventions to improve maternal health, reduce maternal morbidity, and improve the quality of care of women during pregnancy, delivery, and the puerperium. Counting cases is important but not enough. The data must lead to information that can, in turn lead to

specific recommendations and actions, as well as to evaluate the effectiveness of interventions and guide future investments in health including maternal health. It also can increase the awareness of maternal mortality at all levels starting from community to the government leadership and in particular in the ministry of health. See below the dynamics of audit.


**Figure 1: Dynamics of Maternal Mortality Audit (surveillance and response)**

## The objectives of Maternal Mortality Audit

What is the purpose of MMA?

An MMA provides a rare opportunity for a group of health staff and community members to learn from a tragic – which is often preventable - event. MMA should be conducted as learning exercises that do not include finger-pointing, blame or punishment. The purpose of a maternal mortality audit is to improve the quality of safe motherhood programming to prevent future maternal and neonatal morbidity and mortality. Therefore, ***MMA is NOT for blaming or punishment.***

Additionally, MMA is crucial for ensuring and guiding the service providers in following and implementing standards, protocols and guidelines of healthcare services at all levels. That is to determine how services can be improved.

## Scope and levels of Maternal Mortality Audit

There are different approaches for maternal mortality audit that can be used such as:

- Community based MMA
- Facility based MMA
- Confidential enquiries into maternal mortality
- Surveys of severe morbidity (near miss)
- Clinical audit

**Different approaches to MMA**

**Facility-based maternal mortality audit**

- In-depth investigation of the causes of and associated factors in maternal deaths that occur in health facilities.
- Entails interviews of health personnel who attended to the deceased. Can also be extended to interviews of family members who accompanied the deceased.
- The review is nonjudgmental to encourage the cooperation of the health workers involved.
- Provides information for improving obstetric care.

**Community-based maternal mortality audit (verbal autopsy)**

- In-depth nonjudgmental investigation of the causes and the associated factors of maternal deaths that occur outside health facilities.
- Entails interviews of family members who cared for the deceased. This requires a community informant to let local authorities know whenever there is a death of a reproductive-age female in the community.
- The interviewer, who is usually not a health worker, should be sensitive when probing the circumstances leading to the death. In some cultures, the interview is done after the mourning period.
- A team of physicians then examines the interview notes to determine the cause of death.
- When this is combined with the facility-based review described above, it gives a more complete picture of maternal deaths in a given local jurisdiction.

**Confidential enquiries into maternal mortality**

- A national or subnational multidisciplinary committee meets periodically to systematically investigate a representative sample of (or all) maternal deaths to identify the causes and associated factors; the committee then gives written guidelines to health personnel and administrators on how to prevent similar deaths in future.
- The investigation is carried out in a confidential manner ("No blame, no shame").
- Requires a complete and functioning civil registration or health management information system.
- A subnational or district-level panel might be more appropriate in countries with high mortality, so that the guidelines issued can be tailored to local situations.

**Survey of severe morbidity (near misses)**

- A near-miss event refers to one in which a woman has nearly died but survived a complication that occurred during pregnancy, childbirth, or within 42 days of termination of pregnancy.
- This survey is an in-depth investigation of the factors that led to the near miss, what worked well in the treatment of the life-threatening complications, and the lessons learned.
- Unlike the other approaches, in this one the pregnant woman herself is also interviewed, creating the opportunity to obtain more insight into the circumstances.
- This survey is less threatening to health personnel than the others, since the women have survived.

**Clinical audit**

- Entails a systematic review or audit of the obstetric care provided to pregnant women against established protocols or criteria aimed at improving the quality of care.
- Protocols for the management of obstetric complications will have to be established beforehand in order to ascertain whether cases are properly being managed at health facilities.
- If well implemented, it leads to standardized and improved care across health facilities.

## Who will use these guidelines?

These guidelines are designed for those responsible for conducting and/or managing MMA weather were community based or facility based ones. Therefore these guidelines will be used by the following:

1. National Task Force (NTF)
2. Governorate's Core Group (GCG)
3. District's MMA Team
4. Primary Reporter (PR) District RH officer

## MMA Structure and teams

The general structure of the MMA system and teams will be composed of the following:

1. MMA Primary Reporter as focal point (can be RH Officer at district level) in all districts.
2. District's MMA Team
3. Governorate's Core group at each governorate.
4. National Task Force at MoPHP level.

## Tasks and responsibilities of the teams

### Primary Reporter/ MMA Focal Point (RHO)

The RHO will be the primary Reporter at district level. She is the focal point for woman deaths notification from all informers who might be a community volunteer/communicator or Community Midwife (CMW) for the CBMMA and the administrative in charge for the FBMMA in the respected district. The number of informers in the community will depend on the catchment area and the size of population in the respected district. The Primary Reporter will select the community volunteers/communicators/CMW. The facility's management will nominate the administrator in charge who will be responsible for notification to the primary reporter.

***Responsibilities of Primary Reporter***

- Identify Community communicator/volunteers/CMW and actively network with them.
- Follow up / monitoring Community communicator/volunteers/CMW on the notification process of maternal deaths.
- Report all suspected maternal deaths to the Governorate's Core Group and the district surveillance officer within 24 hours of receiving the notification

from the informers (community volunteers/communicators/ administrative in charge).

- Maintain registers of all women deaths (15-49 years) including maternal deaths.
- Participate in conducting the MMA.
- Assist in conducting monthly meetings at district level to review the whole process and take corrective actions at her/his level. Reporting system should be reviewed even if there are no cases in her/his district.
- Assist the Governorate's Core Group in preparation of Case summaries.
- Represent the district at the Governorate's meetings related to MMA.
- Crosscheck her/his registers with the registers at district health office and make necessary amendments. If there are any discovered cases not notified she/he has to inform the GCG immediately by telephone and form in Annex 1 then send report form in annex 4.

## District's MMA Team

This team should have the following members:

1. Primary Reporter (RHO).
2. District Surveillance officer.
3. Community Communicator/Volunteer/CMW.

General skills and qualifications of MMA team members:

1. At least 2 years qualification or equivalent degree in health related specialisation.
2. Excellent communication skills.
3. Experience of at least 5 years at governorate level.
4. Experience in conducting interviews/ research.

***Responsibilities of District's MMA Team***

- To investigate the maternal death using the format for Community Based MMA (Annex 2) within 3 weeks of notification and facility Based MMA (Annex3) within one week.
- To ensure that all relevant information is apprehended in the course of interview. If not, a follow up interview may be required and If required, with another respondent.
- Hand over the filled up form for FBMMA (Annex3) and/or CBMMA (Annex 2) and the MMA team report form (Annex 4) to the GCG for onward communication to the National Task Force.

- To compile listing for all maternal mortalities (15-49 years) from district.

## Governorate's Core Group

The composition of this group should have the following members:

1. General Secretary of Local Council at Governorate.
2. GHO Director General.
3. Senior Obstetrics and Gynecology specialist.
4. Senior Surgeon.
5. Senior anaesthetist if available.
6. Local Authority representative (Planning and Services)
7. RH Director at GHO
8. Health Information System officer at GHO.
9. Governorate's Surveillance officer.

Chairing this group will be rotational quarterly between the members for equalities and active engagement purposes. The focal point for notification will be the RH Director at GHO and her/his role is permanent in this core group as general secretary. The core group will have to conduct regular meetings.

***Responsibilities of GCG***

- Develop plan of action for the core group.
- Supervise MMA implementation in the district – both at facility and community levels and to conduct the FBMMA and/or CBMMA
- Receive audit report and forms of all maternal deaths from the Primary Reporter that occur at district's level.
- Receive audit forms of CBMMA and FBMMA from District's MMA team.
- Prepare a compiled case summary.
- Coordinate the Governorate's MMA meeting and the review meetings with the districts.
- Nominate and ensure the participation of the stakeholders that must attend the MMA review meetings.
- Submit the filled forms and GCG findings report (Annex 5) to the National Task force.
- Ensure that the training on MMA methodology is taken place at governorate's and districts' levels.
- Ensure / Follow up that the recommendations and the outcomes of the review meetings are being implemented e.g.: training and the capacity building, infrastructure strengthening, correction suggested, are taken place at governorate's and districts' levels.
- Ensure availability of funds for payment of incentives.

- Facilitate the printing of forms and their availability at districts' and at facility's levels.
- Participate in conducting orientation meetings for Primary Reporters of all districts in the governorate.
- Facilitate and participate in conducting advocacy sessions at the governorate level on MMA.

## National Task Force

The composition of this group should have the following members:

1. Deputy for Population Sector at MoPHP.
2. Reproductive Health Director General at MoPHP.
3. Senior Obstetrics and Gynecology specialist from university.
4. Senior Anaesthetist.
5. DG of surveillance
6. Independent Public Health Expert.
7. Health Information and research Director General at MoPHP.
8. Quality Director at MoPHP.
9. Representative form MoLA
10. Representative from Ministry of Interior
11. Development Partners Representative.
12. Any other (DPs and other entities).

The Chairperson of this task force is the Deputy Minister for Population Sector and her deputy will be the Senior Obstetrics and Gynecology specialist from university. The Director General of the Reproductive Health Department will be the general secretary of the task force.

***Responsibilities of NTF***

- Develop detailed ToR and plan of action for the task force and detailed ToR for the core group based on the guidelines.
- Receive copy of the MMA reports and forms of all maternal deaths occurred at district's level from the primary Reporter.
- Oversee the audit process.
- Supervise MMA implementation in the governorates.
- Review and validate selected cases of maternal mortalities.
- Nominate and ensure the participation of related stakeholders to attend the MMA review meetings
- Ensure / Follow up of the recommendations and the outcomes of the review meetings.
- Revise national technical guidelines, tools and other relevant documents regularly.
- Ensure that policies and actions are in place.

- Guide governorates on interventions required complying with the recommendations of the review meetings.
- Draw evidence based lessons and advocate for evidence informed policy and decision making at different levels.

## MMA Mechanism

In Yemen the levels that MMA can be established should include the following: Community, Facility, District, Governorate and National levels. However, the two main approaches of MMA that will be followed as the sources of information are the community based and the facility based MMA[6]. The details are explained and particularized below.

## Community level

At community level the most frequently used technique for auditing maternal mortality is through Community Based Verbal Autopsy (CBVA). CBVA MMA is a method of finding out the medical causes of death and ascertaining the personal, family or community factors that may have contributed to the deaths using a verbal autopsy format. The verbal autopsy consists of interviewing people who are knowledgeable about the events leading to the death such as family members (sister, mother, and husband), neighbors, and delivery attendants such as traditional birth attendants.

***Community Based MMA must be carried out for all deaths that occurred in the specified geographical area (District and Governorate), irrespective of the place of death, be it at home, during the journey or at facility.***

**Table 1: Community Based Maternal Mortality Audit**

| | |
|---|---|
| **Definition** | A method of finding out the medical causes of death and ascertaining the personal, family or community factors that may have contributed to the death of a woman who died outside of a medical facility |
| **Requirement** | Cooperation from the family of the woman who died and sensitivity is needed in discussing the circumstances of the death<br><br>Community awareness that no blame no punishment, |
| **Advantages** | Provides means to arrive at medical cause of death when a |

[6] Though there are other approaches for MMA, there are conditions to meet before they can be established. See Annex 6 for different approaches and conditions.

| | |
|---|---|
| | woman dies at home, allows both medical and non-medical factors to be explored, and provides the opportunity to include the family's perspective on health services |
| **Disadvantages** | Different assessors may arrive at different causes of death, deaths from indirect causes may be overlooked / underreported |

## CBMMA Objective

The main objective of CBMMA is to find out various delays and causes leading to maternal deaths, in order to enable the health system taking corrective actions at various levels. Identifying maternal deaths would be the first step in this process. The second step would be the investigation of the factors/causes which led to the maternal death – whether medical, socio-economic or systemic. The third step would be to take appropriate and corrective measures on these, depending on their amenability to various demand side and communication interventions.

## Phases of CBMMA

CBMMA will be conducted by the District's MMA team passing through five main phases as the following: maternal mortality notification, investigation (audit), reporting, audit results review and M&E.

### 1. Maternal Mortality Notification

The first point of community communication is crucial in the MMA process. Community volunteers, community communicators and CMW are widely available close to the communities and therefore will be the best choice for maternal mortalities notification at community level. They should inform the primary reporter; who is the RHO at the DHO, of all women deaths they know of within 24 hours by telephone.

The Primary Reporter will notify all women deaths in the age group of 15 to 49 years from her district by telephone to governorate core group within 24 hours of receiving the notification or knowing of the death. Simultaneously, the Primary Reporter will have to fill in the Primary Reporter notification form (Annex 1) and send it to the following:

1. Copy for GCG.
2. Copy for the records.
3. Copy for the District's Surveillance officer.

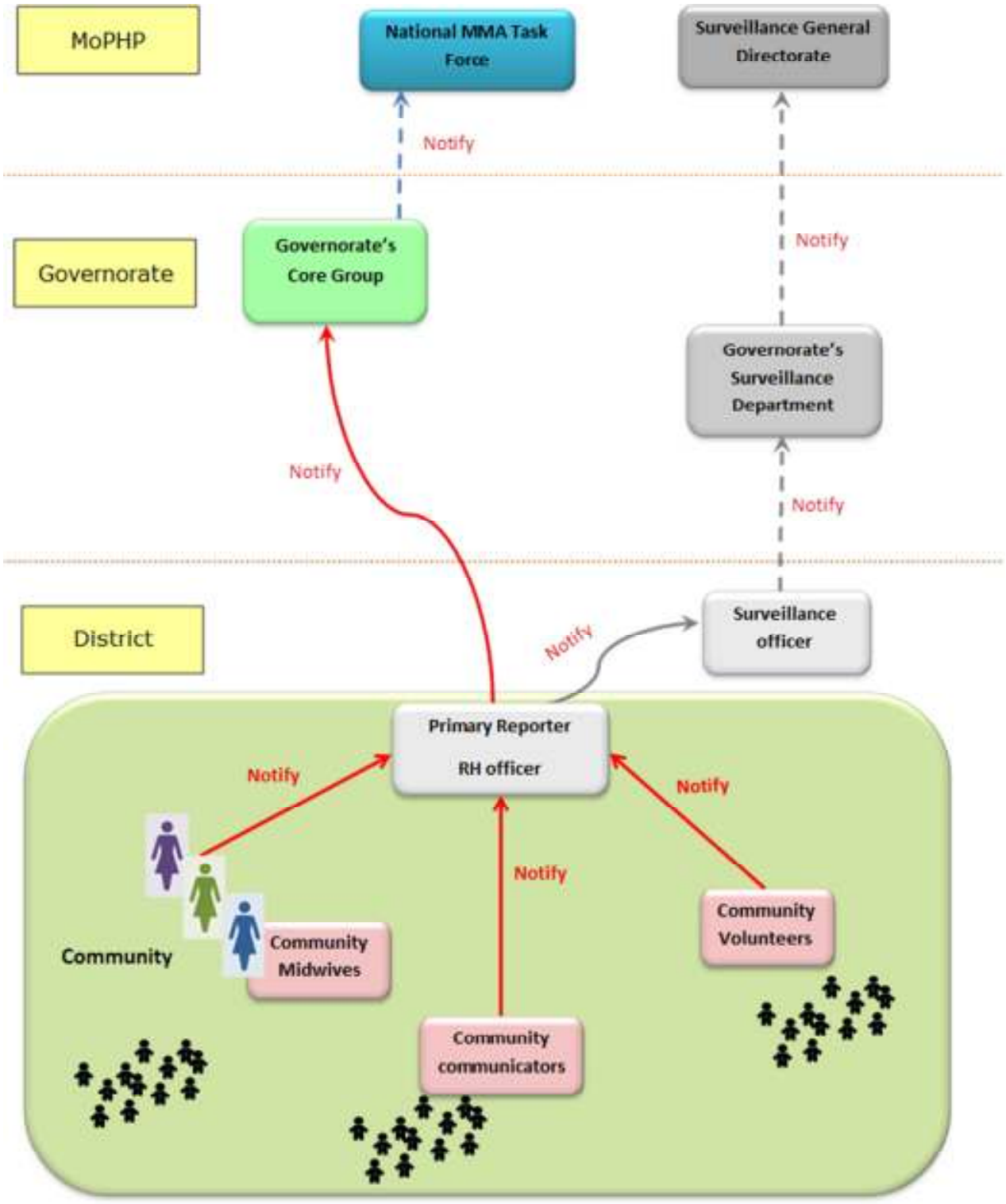


**Figure 2: Notification pathway in CBMMA**

## 2. MMA Audit (investigation)

The MMA team will visit the area where the maternal mortality takes place to further investigate and conduct a Community Based MMA (verbal autopsy) within three weeks of death occurrence; by visiting the deceased woman's house/family in order to collect and obtain complete information relating to the death as per the form in annex 2. The informer can be a team member. It is important to note that RHO is the focal person in conducting the audit and the presence of surveillance officer and/or informer is not essential. However, as resource persons and in case RHO is not available other team members can conduct the visit and report on the event appropriately by following the guidelines. Therefore, training of all team members on the methodology and guidelines is essential.

Availability of respondents for the CBMMA team should be ensured before the visit is conducted. These visits should be made to the house of the deceased and must be convenient to the respondent(s) and considering the period of mourning for the family. This is very important in gaining useful information that reflects the actual event of death.

The team will use the verbal autopsy forms in annex 2. It is called so because the team seeks detailed information on the death event and the surrounding circumstances in order to reach to the cause of death. The information is collected through verbal detailed communication and explanation of the event and its circumstances and contributory factors whether they were social, cultural, financial and/or health services related ones.

The District's MMA Team must ensure seeking the details on various events the deceased women went through, and should be explained in detailed method. The completeness of forms should be ensured before submitted to the GCG. Causes of maternal death can be divided into two types; medical causes and non-medical causes.

After completing the Community Based MMA (verbal autopsy) form, and the **case summary and MMA report form** for confirmed maternal deaths using the form in annex 4**;** they should be immediately submitted to GCG who will discuss and analyse the findings. GCG will have to confirm the maternal mortality and prepare monthly report of all maternal mortality cases in the governorate and the distribution in its districts. The MMA team should establish the cause of death. However, GCG should confirm the assigning of cause of death or reject it with clarifications and justifications for the team.

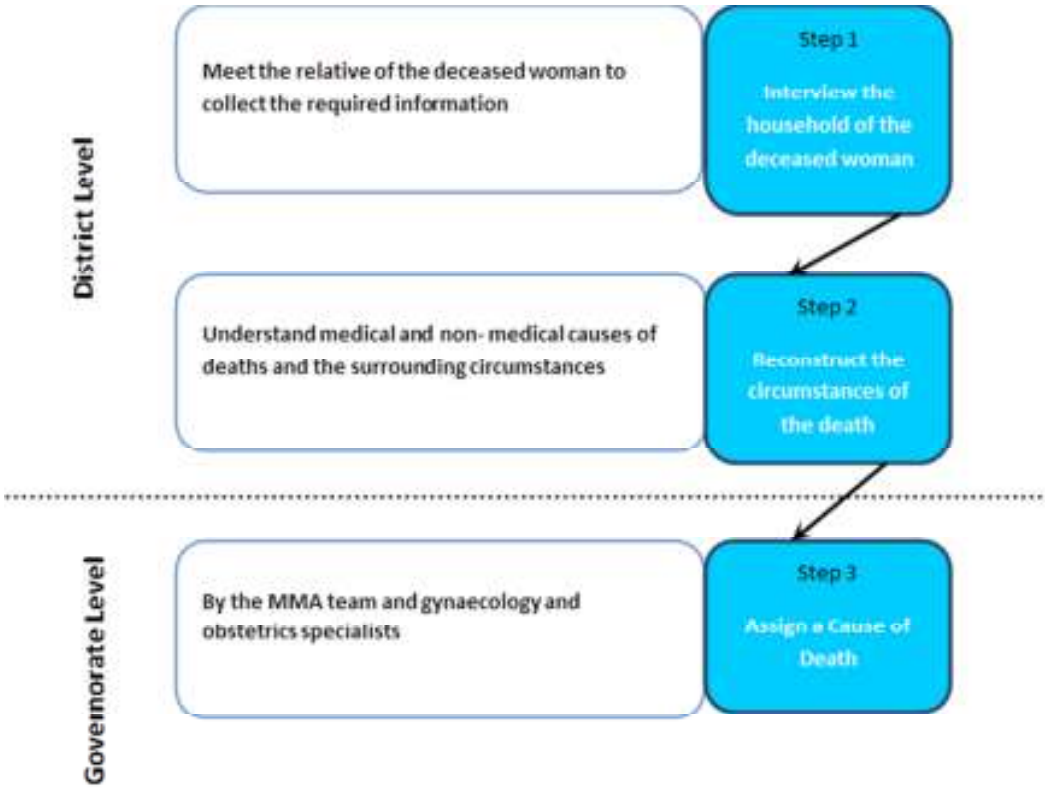


**Figure 3: Steps of CBMMA**

### 3. Reporting

Reporting is an important step and at each level of the system reports should be submitted regularly as the following:

*Primary Reporter (RHO):*

The Primary Reporter will submit the notification forms to the GCG and the surveillance officer at the DHO within 24 hours of knowing about the death case.

Moreover the Primary Reporter will have to submit the completed CBMMA forms and report to the GCG within 4 weeks of the maternal mortality notification.

A monthly report of all maternal deaths occurred in the district should be prepared and submitted to the GCG, even if there is no death, at the beginning of each month ($5^{th}$ of each month).

*GCG*

GCG will have to submit a monthly report of all women deaths (age 15-49 years) and state the maternal deaths occurred in the Governorate to the NTF at the beginning

of every month. Even if there is no death the report will state the nil cases of maternal mortality in that month. The RHD and Surveillance officer will be responsible to prepare this report on behalf of the GCG as per the format (Annex 6).

Upon receiving the MMA forms and reports; the GCG will review the audit forms and reports quarterly. Their findings and comments will be submitted in quarter report to the NTF within 1 week after GCG meeting. GCG will prepare a quarterly summary report to discuss it with the Governorate's local authorities and/or the Health Development Councils. This is very important to inform the decision makers at governorate level of the maternal mortality situation and keep them updated on mortalities' status. Sharing information and informing local decisions are crucial for taking measures to reduce maternal mortalities and to advocate for implementing recommendations, corrective actions and seeking additional funds for these interventions.

GCG will have to report on the meetings, recommendations, outcomes and proposed corrections to the NTF on a quarterly basis.

*NTF*

The NTF will receive the MMA reports from MMA team and review them. They will also study and review maternal mortality cases. The NTF will receive the quarterly reports from GCGs and appraise them regularly.

A quarterly report on the national status of maternal mortalities will have to be prepared by the NTF. This report will be presented in the quarterly meeting and shared with other stakeholders.

Annual report will be prepared and presented in a national workshop where all stakeholders will be invited to attend and participate.

### *4. MMA results review*

The main principal to keep in mind throughout this process is confidentiality and no blame to anyone. Keeping the objectives clear throughout the whole process and at all levels of reviewing and auditing maternal mortalities is essential for securing success of the audit. It is not meant to be for knowing the prevalence only and geographical distribution of cases. Reviewing results should be an exercise aiming at drawing lessons from each case and all cases to feed in future decision making and corrective measures to reduce maternal mortalities.

At the death review meetings, members may take turns reading the case summaries. After each case summary is read, the members then discuss the case, the events that may have led to the mother's death. If any points are unclear, the

reviewers will explain. The secretary should keep a list of the main points of the discussion.

The review results of MMA should follow three main principles:

1. Anonymity and confidentiality of information related to deceased woman and health workers identification.
2. Feedback of the findings and recommendations to facility and community levels.
3. Safeguard of health workers and prevention of use of findings in litigation.

**MMA District's Meeting**

The Primary Reporter (RHO) will arrange a monthly meeting with the DHO and discuss the summary of all maternal mortalities taken place in the district.

**GCG Meeting**

This meeting will be organized periodically (quarterly) by the GCG and chaired by the Governor/HDC chairperson. The meeting will discuss a sample of maternal cases that occurred at home, on the way and at facilities. The GCG will present these cases and summary of all maternal mortalities happened in the governorate during the quarter prior the meeting.

Objectives of the meeting

- To institute measures to prevent maternal mortalities due to similar reasons in the district/governorate in future.
- To sensitize the service providers to improve their accountability.
- To realize the system gaps including the facility level gaps and take appropriate and timely corrective measures.
- To allocate funds from the governorate's health budget for the interventions.
- To take necessary actions both with health and other stakeholders and review actions taken.
- Liaise with the NTF on the recommendations made by the Governorate's Core Group.

**MMA NTF Meeting**

The NTF will meet quarterly to discuss and review the reports submitted by the GCGs and the MMA teams. Selected cases will be chosen for further

discussion and validation; and feedback will be sent to the GCGs. It is very important to engage the Reproductive Health Technical Group in the audit process and update them on the cases of maternal mortalities and on the progress in reducing them. Information on corrective measures and actions taken is very important to share with all stakeholders for harmonization and alignment purposes.

In the national dissemination workshop the annual report of maternal mortality audit will be presented and case studies might be presented as well.

### 5. Monitoring & Evaluation

The monitoring and evaluation for the MMA process is very important and crucial for success. More elaboration on this part will be presented later (below) in these guidelines (see MMA management).

## CBMMA activities flowchart

**Table 2: CBMMA Activities flowchart**

| Activity | Level | Responsible | Timeline |
|---|---|---|---|
| Notifying death of women (15-49 years) | Community/ Villages | community volunteers / communicators/ CMW | Within 24 hours of death occurrence by telephone |
| Reporting death of woman | District | Primary Reporter (RHO) | Within 24 hours of death occurrence by phone |
| Community based MMA | District | MMA Team | Within 3 weeks of death occurrence |
| Submission of audit forms and report to the GCG | District | MMA Team | Within 1 week of audit conduction |
| Submission of audit forms and report to the NTF | Governorate | GCG | Within 1 week of receiving the documents |
| Governorate's Monthly report on maternal mortality | Governorate | RHO and Surveillance officer | Every month ( 5$^{th}$ of that month) |
| Quarterly report on Maternal Mortality in the governorate including recommendations and corrective actions | Governorate | GCG | Within 1 week after the meeting |

## Facility Level

Facility Based Maternal Deaths Reviews will be taken up for all public and private health facilities that provide obstetrics and gynecology services in particular delivery services. If death occurred in other facilities they should be audited as well.

**Table 3: Facility Based Maternal Mortality Audit**

| | |
|---|---|
| **Definition** | A qualitative, in-depth investigation of the causes of and circumstances surrounding a maternal death at a health facility; the death is initially identified at the facility level but such reviews are also concerned with identifying the combination of factors at the facility and in the community that contributed to the death, and which ones were avoidable. |
| **Requirement** | Cooperation from those who provided care to the woman who died, and their willingness to report accurately on the management of the case. |
| **Advantages** | Is a well-understood process in some settings, allows for complete review of medical aspects, provides a learning opportunity for all staff, and can stimulate improvements to medical care. |
| **Disadvantages** | Requires committed leadership at the facility level, does not provide information about deaths occurring in the community. |

## FBMMA Objective

The objective of this process is to identify various delays causing maternal deaths in the health facilities and to enable healthcare system to take corrective measures at various levels. Identifying maternal deaths would be the first step in the process of review, the second step would be the investigation of the causes which led to the maternal death mainly clinical and systemic and the third step would be to take appropriate and corrective measures.

Institutions: Both Public and Private that provide Obstetric care (BEmOC, CEmOC and other facilities)

## Phases of FBMMA

FBMMA will be conducted by the District's MMA team passing through five main phases as the following: maternal mortality notification, investigation (audit), reporting, audit results review and M&E.

1. ***Maternal Mortality Notification***

All maternal deaths occurring in the facility, including abortions and ectopic gestation related deaths, for pregnant women or within 42 days after termination of pregnancy irrespective of duration or site of pregnancy; should be informed immediately by the health worker (Physician, midwife or paramedical staff) who has treated the mother and/or was on duty at the time of death to the facility administrative in charge.

The facility administrative in charge then should inform the maternal death to the Primary Reporter (RHO) at district level by telephone within 24 hours of the death occurrence.

The primary reporter in turn will notify all maternal deaths from her/his district by telephone to governorate core group within 24 hours. Additionally, primary reporter will have to fill in the **primary reporter notification form** (Annex 1) and send it to the following:

1. Copy for GCG.
2. Copy for the records.
3. Copy for the district's surveillance officer.

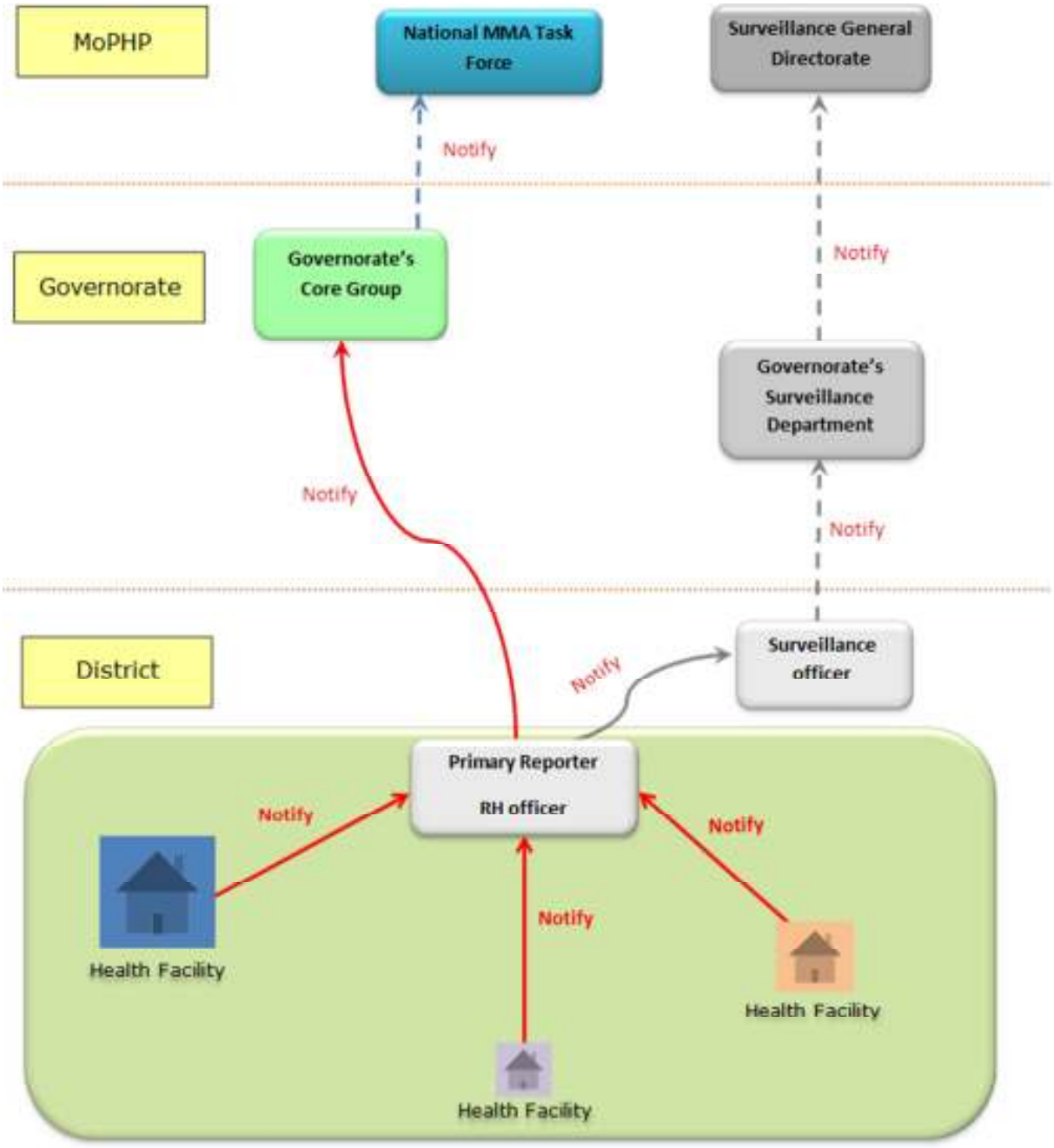


**Figure 4: Notification pathway in FBMMA**

### *2. MMA Audit (investigation)*

The MMA team will visit to the area where the maternal mortality taken place to further investigate and conduct a Facility Based MMA using the form in annex 3 within one week of death occurrence. Additionally, the district's MMA team will conduct Community Based MMA (verbal autopsy) within three weeks of death

occurrence. All pregnant and postpartum women that were treated, and died, in other departments than the Obstetrics and Gynecology department, must also be reported and investigated.

For the CBMMA the process will be similar to that detailed in previous section on community based methodology using verbal autopsy forms (Annex2).

***The conditions on which CBMMA will be required most are the following:***

1. If death has taken place outside the facility (including "on the way" death cases).
2. If the woman arrived in late stage of serious condition (e.g. gasping) and died shortly after admission to the health facility.
3. If woman was referred from other health facility.
4. If the woman was admitted and given the first aid care but died within 30 minutes of admission to the health facility.

These visits should be made in a complete confidential manner and ensure the facility's health providers for the objective of the audit: no punishment or no blame, and no court. This is very important in gaining useful information that reflects the actual event of death. The Facility Based MMA forms in annex 3 should be filled carefully by the District's MMA team.

After completing the Facility Based MMA (verbal autopsy) form, **case summary and MMA report form** for confirmed maternal deaths should be filled in using the form in annex 4; they should be immediately submitted to GCG who will discuss and analyse the findings. GCG will have to confirm the maternal mortality and prepare monthly report of all maternal mortality cases in the governorate.

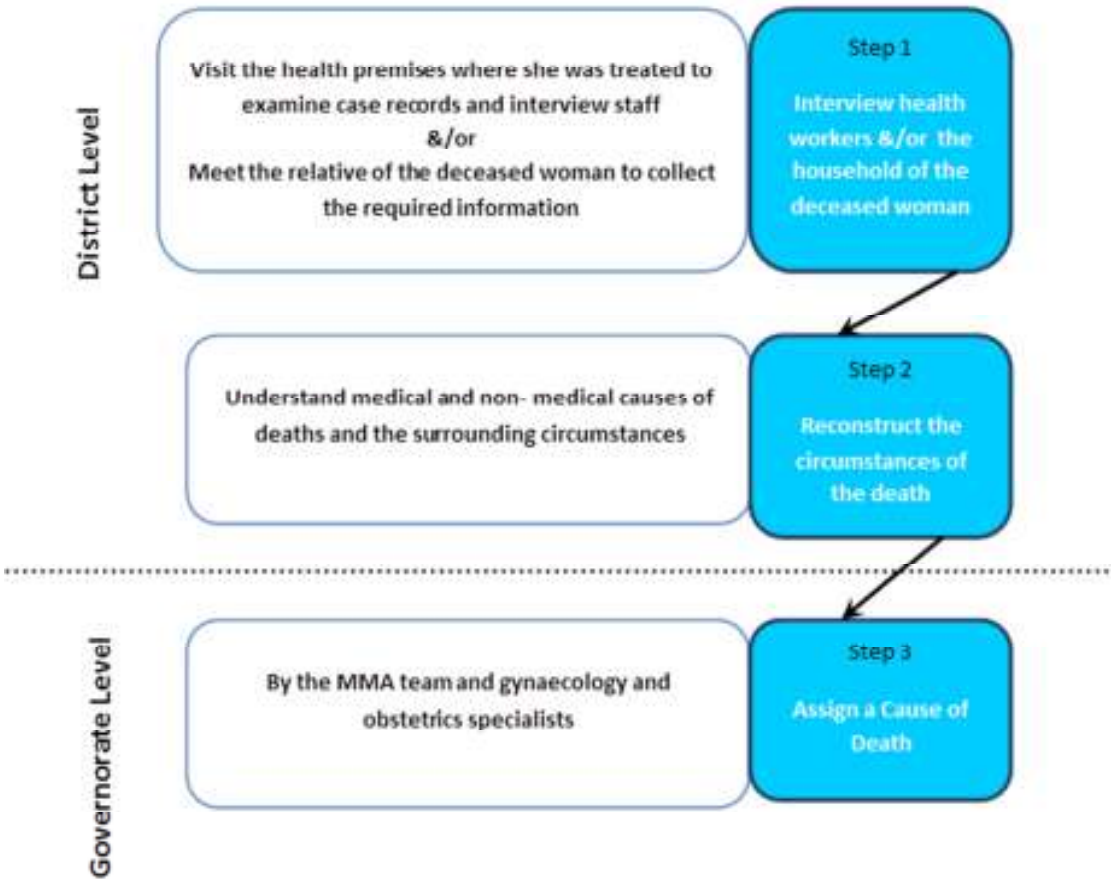


**Figure 5: Steps of FBMMA**

### *3. Reporting*

Reporting is an important step and at each level of the system reports should be submitted regularly as the following:

*Primary Reporter (RHO):*

The Primary Reporter will submit the notification forms to the GCG and the district's surveillance officer within 24 hours of knowing about the death from the facility focal point (administrative in charge).

Moreover the Primary Reporter will have to submit the completed FBMMA and CBMMA forms and reports to the GCG within 4 weeks of the maternal mortality notification.

A monthly report of all maternal deaths occurred in the district should be prepared and submitted to the GCG, even if there is no death, at the beginning of each month ($5^{th}$ of each month).

*GCG*

GCG will have to submit a monthly report of all women deaths (age 15-49 years) and state the maternal deaths occurred in the Governorate to the NTF at the beginning of every month. Even if there is no death the report will state the nil cases of maternal mortality in that month. The RHD and Surveillance officer will be responsible for this report submitted on behalf of the GCG as per the format (Annex 6).

Upon receiving the MMA forms and reports; the GCG will review the audit forms and reports quarterly. Their findings and comments will be submitted in quarter report to the NTF within 1 week after GCG meeting. GCG will prepare a quarterly summary report to discuss it with the Governorate's local authorities and/or the Health Development Councils (HDC). This is very important to inform the decision makers at governorate level of the maternal mortality situation and keep them updated on mortalities' status. Sharing information and informing local decisions are crucial for taking measures to reduce maternal mortalities and to advocate for implementing recommendations, corrective actions and seeking additional funds for these interventions.

GCG will have to report on the meetings, recommendations, outcomes and proposed corrections to the NFT on a quarterly basis; within 1 week after GCG meeting.

*NTF:*

The NTF will receive the MMA reports from MMA team and review them. They will also study and review maternal mortality cases. The NTF will receive the quarterly reports from GCGs and appraise them regularly.

A quarterly report on the national status of maternal mortalities will have to be prepared by the NTF. This report will be presented in the quarterly meeting and shared with other stakeholders.

Annual report will be prepared and presented in a national workshop where all stakeholders will be invited to attend and participate.

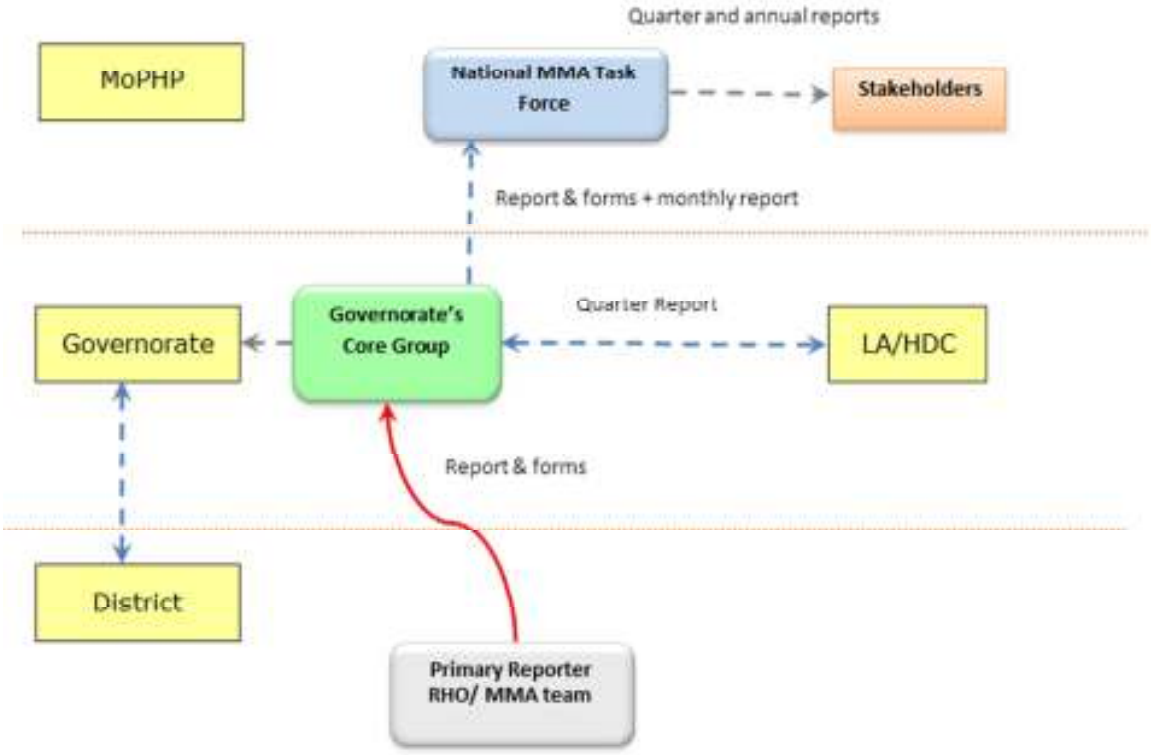


**Figure 6: Reporting pathway in MMA system**

### *4. MMA results review*

The main principal to keep in mind throughout this process is confidentiality; therefore no blame to anyone. Keep the objectives clear throughout all steps of reviewing and auditing maternal mortalities at all levels (no names – no blames). It is not meant to be for knowing the prevalence only and geographical distribution of cases. Reviewing results should be an exercise aiming at drawing lessons from each case and all cases to feed in future decision making and corrective measures to reduce maternal mortalities.

At the death review meetings, members may take turns reading the case summaries. After each case summary is read, the members then discuss the case, the events that may have led to the mother's death. If any points are unclear, the reviewers will explain. The secretary should keep a list of the main points of the discussion.

The review results of MMA should follow three main principles:

1. Anonymity and confidentiality of information related to deceased woman and health workers identification.
2. Feedback of the findings and recommendations to facility and community levels.

3. Safeguard of health workers and prevention of use of findings in litigation.

**MMA District's Meeting**

The Primary Reporter (RHO) will arrange a monthly meeting with the DHO and/or the facility to discuss the summary of all maternal mortalities taken place in the district (weather facility or community).

**GCG Meeting**

This meeting will be organized periodically (quarterly) by the GCG and chaired by the Governor / HDC chairperson. The meeting will discuss a sample of maternal cases that occurred in community, on the way and in health facilities. The GCG will present these cases and summary of all maternal mortalities taken place in the governorate during the past quarter.

<u>Objectives of the meeting</u>

- To institute measures in order to prevent maternal mortalities due to similar reasons in the district/governorate in future.
- To sensitize the service providers to improve their accountability.
- To identify circumstances under which the death took place.
- To identify cause of maternal death: Direct obstetric, indirect obstetric and non-obstetric cause.
- To realize the system gaps including the facility level gaps and take appropriate and timely corrective measures, e.g.: Action related to infrastructural strengthening, human resource availability, protocols and competence of staff, Supplies and Equipment.
- To allocate funds from the governorate's health budget for interventions implementation.
- To take necessary actions for demand-side interventions in addressing first and second delays and required actions.
- Liaise with the NTF on the recommendations made by the Governorate's Core Group.

**MMA NTF Meeting**

The NTF will meet quarterly to discuss and review the reports submitted by the GCGs and the MMA teams. Selected cases will be chosen to further discussion and validation; and feedback will be sent to the GCGs. Information on corrective measures and actions required for addressed

issues will be reflected in the feedback. It is very important to share with all stakeholders such information for harmonization and alignment purposes.

In the national dissemination workshop the annual report of maternal mortality audit will be presented and case studies might be presented as well.

### *5. Monitoring & Evaluation*

The monitoring and evaluation for the MMA process is very important and crucial for success. More elaboration on this part will be presented later (below) in these guidelines (see MMA management).

## FBMMA Activity Flowchart

**Table 4: FBMMA Activities flowchart**

| Activity | Level | Responsible | Timeline |
|---|---|---|---|
| Notifying death of women (15-49 years) | Health facility | Facility's administrative in charge | Within 24 hours of death occurrence by phone |
| Reporting death of woman | District | Primary Reporter (RHO) | Within 24 hours from notification of death by telephone |
| Facility based MMA | District | MMA Team | Within 1 week of death occurrence |
| Community based MMA[7] | District | MMA Team | Within 3 weeks of death occurrence |
| Submission of audit forms and report to the GCG | District | MMA Team | Within 1 week of audit conduction |
| Submission of audit forms and report to the NTF | Governorate | GCG | Within 1 week of receiving the documents |
| Governorate's Monthly report on maternal mortality | Governorate | RHO and Surveillance officer | Every month ( 5th of that month) |

[7] See conditions above in which the MMA Team will have to conduct CBMMA in addition to the FBMMA.

| | | | |
|---|---|---|---|
| Quarterly report on Maternal Mortality in the governorate including recommendations and corrective actions | Governorate | GCG | Within 1 week after the meeting |

Please see annex 9 for the hospital committee roles and responsibilities.

The following general principles can help make the review process more effective and efficient:

- The problems leading to maternal death are frequently not all medical - think holistically.
- Focus only on those events that may have directly contributed to the maternal death throughout pregnancy and delivery, not everything that happened.
- Quality of care received by the mother should be compared both to accepted local practice as well as best medical practice.
- While most cases are unique, try to group problems into general categories (e.g., lack of transportation to health care facility) while keeping enough information so that a specific strategy can be developed (e.g., not "improve health care system").

## MMA Management

For sustainable and complying with decentralization purposes the majority of MMA process management should take place at Governorate's level. Additionally this will emphasise the importance of seeking funds and advocacy at lower levels of the system.

Management of MMA process will go through the following stages

1. Planning: where at each level the responsible structure will plan annually for MMA activities and for further next steps as follows in this section.

2. Preparation: before conducting field work there must be preparation such as ensuring the forms are complete, family members are available, all concerned people are informed, etc.
3. Execution: conduction of MMA and data collection which is the main responsibility of MMA team. The accurate execution of audit is fundamental to the success of any further interventions or recommendations to tackle maternal mortality issues.
4. Monitoring: monitoring and evaluation is a very important step to make necessary corrections of the MMA process and / or development.

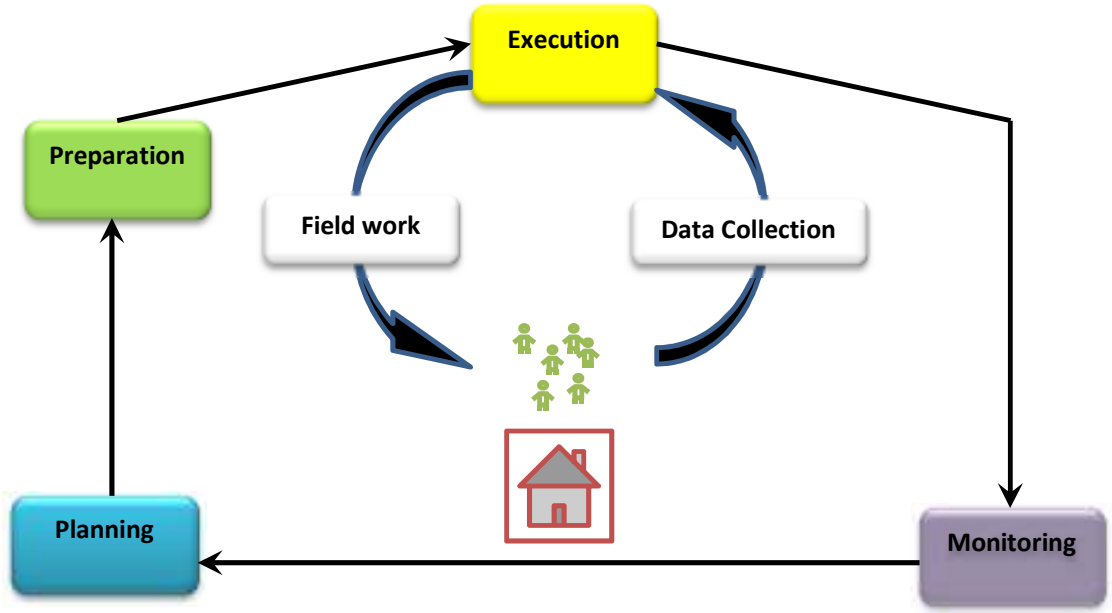


Figure 7: Audit Management Process

**MMA Monitoring and Evaluation**

Monitoring and evaluation activities should be considered at earlier stage of the preparation to implement MMA. This is very crucial to ensure the success of approach and reaching the planned objectives of MMA.

**MMA monitoring**

Monitoring and evaluation of the MMA should be in place to ensure that the major steps in the system are functioning adequately and improving with time. It is also important to assess the timeliness of the information and the coverage of the system. Monitoring of the MMA system should be carried out both at national and governorate level.

**Evaluation of the MMA**

In addition to the monitoring indicators that provide a quick snapshot of whether the system is improving, periodically a more detailed evaluation is useful particularly if i) the indicators demonstrate that one or more of the steps in the MMA process is not reaching expected targets, or ii) if maternal mortality is not decreasing. Since the main purpose of MMA is to lead to action to reduce maternal deaths if this is not happening the system is failing. A more detailed evaluation can also be used to assess whether the system can function more efficiently. Ideally, an evaluation of the quality of information provided would also take place periodically. The evaluation of MMA system should take efficiency and effectiveness into consideration.

## Ethical and impartiality/neutrality issues

MMA team and committee members will be the only persons knowing the names of deceased and health care workers involved in the management of the case. These team members and committee members will have the right to access facility records or community filled tools of cases. The ministry of health will be responsible to establish mechanisms that provide legal protection from liability.

Ethical principal and issues will be considered when auditing maternal deaths both at community and facility level. These include:

a. **Autonomy:** family and relatives of the deceased will be well informed about the audit process. Their voluntary participation will be sought for and the interview can be interrupted at their request. The convenience of time and circumstances to conduct the verbal autopsy is necessary and should consider the mourning period.

b. **Confidentiality:** Families and health care workers directly and indirectly involved in the audit process have to be reassured of their privacy. The identities of the deceased, family and health care providers involved in the management should be kept confidential and known only to those who are doing the actual audit. All persons having access to identifiable information will sign a confidentiality agreement stating that they will not disclose any identifiable information. Data collection forms, case summaries, review meeting minutes and reports or dissemination results will not contain any personal identifiers. *All records of cases reviewed & any discussion will be kept secured; hard copy information will be kept in locked cabinets/offices and electronic data in password protected files.*

c. **Beneficence:** Data obtained through the MMA should be tailored in a way that enables production of response actions at different levels.

Another important issue is the consent of the respondents in particular those from households. The confidentiality issue should be confirmed and assured to feel comfortable while responding to the questions.

## Maternal Mortality Audit Tools (forms and questionnaires)

| | |
|---|---|
| Notification Form | (*Annex 1*) |
| CBMMA Form | (*Annex 2*) |
| FBMMA Form | (*Annex 3*) |
| MMA team Report Form | (*Annex 4*) |
| Governorate Core Group (GCG) Findings and Report Form | (*Annex 5*) |

# Annexes

Annex 1: Notification Form

Annex 2: CBMMA Form

Annex 3: FBMMA Form

Annex 4: MMA team Report Form

Annex 5: Governorate Core Group (GCG) Findings and Report Form

Annex 6: Other MMA Approaches

Annex 7: Guiding ideas

Annex 8: Cause of Death Classification

Annex 9: Guide to categorizing contributory factors

## Annex 1: Notification Form

**Notification Form** (filled by the Primary Reporter)

| | | | |
|---|---|---|---|
| **Governorate** | **District:** | **Village:** | |
| **Who informed the PR (Informer) :** | | | |
| **Where the death occurred:** | ☐Home<br>☐On the way to facility | ☐Health Facility (Specify level) | ☐Private Clinic/ Centre<br>☐Don't Know |
| **Name of the Deceased:** | _____ | | |
| **Date of death:** | ☐☐DD ☐☐MM ☐☐☐☐YYYY | | |
| **Time of death:** | ☐☐☐☐am | ☐☐☐☐pm | |
| **Gravidity/ Parity:** | _____ | | |
| **Status of pregnancy at the time of death:** | ☐Abortion<br>☐Antenatal | ☐Ectopic<br>☐Intrapartum | ☐Postpartum<br>(within 42 days) |
| **Condition on Admission:** | ☐Stable | ☐Serious | ☐Brought dead |
| **Probable cause of death:** | _____ | | |
| **Status of the newborn** | ☐dead | ☐alive | |
| | | | |
| **Name:** | _____ | | |
| | | | |
| **Date:** | ☐☐DD☐☐MM ☐☐☐☐YYYY | | |
| **Signature:** | | | |

## Annex 2: CBMMA form

**Community Based MMA** Verbal Autopsy (to be filled by the MMA team)

| | | | |
|---|---|---|---|
| Governorate | District | Village | |
| Name of the deceased (pregnant woman): | _____ | | |
| Age of Marriage in (years): | ☐☐ | | |
| Age at death (Maternal): | ☐☐ | | |
| Date of death: | ☐☐DD ☐☐MM ☐☐☐☐YYYY | | |
| Time of death: | ☐☐☐☐am | ☐☐☐☐pm | |
| Place of death: | ☐Home | ☐On the way | ☐Other |
| Residence: | ☐Rural | ☐Urban | |
| Gravida: | ☐☐Live Births<br>☐☐Abortions | ☐☐Still Births | ☐☐ number of Living children |
| Education level: | ☐None<br>☐Secondary | ☐read/write<br>☐Higher | ☐Primary |
| Occupation of deceased: | _____ | | |
| Nationality: | _____ | | |
| Name of husband/or the other Interviewee: | _____ | | |
| Can you give me more details about the circumstances of her actual death: | | | |
| Stage of pregnancy when she died: | ☐During pregnancy<br>☐during delivery | ☐after delivery within 42 days | ☐after 42 days of delivery |
| how many months/weeks if pregnant: | ☐☐ weeks | | |
| If women died pregnant or within 42 days of delivery/abortion: | | | |
| Seek about danger signs awareness: | ☐Yes | ☐No | ☐Don't know |
| Delay in decision making: | ☐Yes | ☐No | ☐Don't know |
| Did she receive ANC: | ☐Yes | ☐No | ☐Don't know |
| If yes, | No. of visits: ☐ | | |
| Place of antenatal care: | ☐Private clinic<br>☐District hospital | ☐Health Unit<br>☐Referral Hospital | ☐Health center<br>☐Other |
| Was she told that she has risk factors: | ☐Yes | ☐No | ☐Don't know |
| Complication | ☐Previous C/Section<br>☐Hypertension<br>☐Twins<br>☐Anaemia | ☐Abnormal Presentation/lie<br>☐Hypertension with Proteinuria<br>☐Other | ☐Glycosuria<br>☐Abdominal Pain<br>☐Ante Partum bleed |
| If no, reason | ☐Lack awareness<br>☐Lack of provider<br>☐Other | ☐Lack of accessibility | ☐Lack of fund<br>☐Family problem |
| Past medical/surgical history: | _____ | | |
| Where was the delivery/abortion | ☐Home | ☐Health facility | ☐Other |
| Who attended the delivery: | ☐TBA | ☐Midwife/ | ☐Obstetrician |

| | | | |
|---|---|---|---|
| | ☐GP<br>☐Other | nurse | ☐Don't know |
| Did she have bleeding during pregnancy: | ☐Yes | ☐No | ☐Don't know |
| Did she have too much bleeding at the beginning of labour pains | ☐Yes | ☐No | ☐Don't know |
| Did she have too much bleeding during labour | ☐Yes | ☐No | ☐Don't know |
| Did she have much bleeding after delivering | ☐Yes | ☐No | ☐Don't know |
| Did she have prolonged labour> 12 hrs | ☐Yes | ☐No | ☐Don't know |
| Did she have difficulty in delivering the baby: | ☐Yes | ☐No | ☐Don't know |
| Did she have an assisted delivery baby: | ☐Yes | ☐No | ☐Don't know |
| Did she have difficulty in delivering the placenta: | ☐Yes | ☐No | ☐Don't know |
| Did she have fits during pregnancy/during labour or after labour: | ☐Yes | ☐No | ☐Don't know |
| Did she have fever: | ☐Yes | ☐No | ☐Don't know |
| Did she have foul smelling discharge: | ☐Yes | ☐No | ☐Don't know |
| Did she seek care when complication developed: | ☐Yes | ☐No | ☐Don't know |
| Type of abortion: | ☐Induced<br>☐Don't know | ☐Spontaneous | ☐Septic |
| If the abortion was induced, how was it induced: | ☐Medicine<br>☐Instrumentation | ☐Traditional<br>☐Don't know | ☐herbal application |
| Where did she have the abortion | ☐Home<br>☐Don't know | ☐Government Facility | ☐Private Facility |
| Who performed the abortion | ☐Doctor<br>☐Others | ☐ Nurse/Midwife | ☐TBA |
| Did she had Severe Blood loss after abortion: | ☐Yes | ☐No | ☐Don't know |
| If yes, whom/where did she seek care: | | | |
| If no, why: | | | |
| What do you think was the cause of her death: | | | |
| What do you think could have changed the outcome and prevented her death: | | | |
| Are there any messages you would like to give those who are in charge of maternity services about how the care for pregnant women can be improved: | | | |
| | | | |
| Investigator/Interviewer's name: _____ | | | |
| Date: ☐☐DD☐☐MM ☐☐☐☐YYYY | | | |
| Signature | | | |

## Annex 3: FBMMA Form

**Facility Based MMA** (to be conducted and filled by MMA team)

**Section A**

| | | | |
|---|---|---|---|
| Governorate: | District: | Village: | |
| Type of facility: | ☐Private hospital<br>☐Referral hospital | ☐Health center | ☐District hospital |
| Name of the deceased (pregnant woman): _____ | | | |
| Age of Marriage in (years): | ☐☐ | | |
| Age at death (Maternal): | ☐☐ | | |
| Date of death: | ☐☐DD ☐☐MM ☐☐☐☐YYYY | | |
| Time of death: | ☐☐☐☐am | ☐☐☐☐pm | |
| Place of death: | ☐Home | ☐On the way | ☐Other |
| Residence: | ☐Rural | ☐Urban | |
| Gravida: | ☐☐Live Births<br>☐☐Abortions | ☐☐Still Births | ☐☐ Number Living Children |
| Education level: | ☐None<br>☐Secondary | ☐read/write<br>☐Higher | ☐Primary |
| Nationality: | _____ | | |
| Admission to hospital: | | | |
| Date: | ☐☐DD☐☐MM ☐☐☐☐YYYY | | |
| Time: | ☐☐☐☐am | ☐☐☐☐pm | |
| Duration of time from complications to admission: | | ☐☐days ☐☐Hrs | ☐☐mins |
| Main attendant at delivery: | ☐Obstetrician<br>☐Traditional birth attendant (TBA) | ☐General Practitioner (GP) | ☐Nurse/midwife (MW)<br>☐Other |
| Years of experience of the main attendant | _____ | | |
| Condition on Admission: | ☐Stable | ☐Serious | ☐Brought dead |
| Stage of delivery on admission: | ☐Abortion<br>☐Antenatal | ☐Ectopic<br>☐Intrapartum | ☐Postpartum (within 42 days) |
| Gestation in weeks when death occurred: | ☐☐ weeks | | |
| Time after delivery/aborted on admission | ☐☐min ☐☐ hrs ☐☐DD ☐☐MM | | |
| Was she referred from another centre | ☐Yes | ☐No | ☐Don't know |
| If yes, how many centers: | | | |
| How far (distance): | ☐☐_____ | | |
| Did she receive ANC: | ☐Yes | ☐No | ☐Don't know |
| If yes, | No. of visits: ☐ | | |
| Place of antenatal care: | ☐Private clinic<br>☐District hospital | ☐Health Unit<br>☐Referral Hospital | ☐Health center<br>☐Other |
| Was she told that she has risk factors: | ☐Yes | ☐No | ☐Don't know |
| Complication | ☐Previous CS | ☐Abnormal | ☐Glycosuria |

| | | | |
|---|---|---|---|
| | ☐Hypertension<br>☐Twins<br>☐Anaemia | Presentation/lie<br>☐Hypertension with Proteinuria<br>☐Other | ☐Abdomen Pain<br>☐Ante Partum bleed |
| If no, reason | ☐Lack awareness<br>☐Lack of provider | ☐Lack of accessibility<br>☐Other | ☐Lack of fund<br>☐Family problem |
| Past medical/surgical history: | _____ | | |
| Temperature: | BP: | RR: | Pulse: |
| Status of pregnancy at the time of death: | ☐Abortion ☐ Antenatal | ☐Ectopic<br>☐Intrapartum | ☐Postpartum (within 42 days) |
| If she was in labour; was partograph used | ☐Yes | ☐No | ☐Don't know |
| Duration of labour: | ☐☐hrs ☐☐min | | |
| In which phase of labour did she die | ☐Latent phase<br>☐Second stage | ☐Active phase<br>☐Third stage | ☐ > 24hrs after delivery |
| Clinical examination findings, laboratory tests (if available): | | | |
| Did she have | | | |
| Foul smelling discharge: | ☐Yes | ☐No | ☐Don't know |
| Fever: | ☐Yes | ☐No | ☐Don't know |
| Fits and loss of consciousness: | ☐Yes | ☐No | ☐Don't know |
| Vaginal bleeding | ☐Yes | ☐No | ☐Don't know |
| Chest pain: | ☐Yes | ☐No | ☐Don't know |
| Delivery: | ☐Undelivered<br>☐CS | ☐Vaginal (unassisted) | ☐Vaginal (assisted Vacuum/forceps) |
| Details of Baby: | ☐Live birth<br>☐intrauterine fetal death | ☐Still birth<br>☐Miscarriage | ☐Died after birth within 28 days |
| Type of abortion: | ☐Induced<br>☐Don't know | ☐Spontaneous | ☐Septic |
| If the abortion was induced, how was it induced: | ☐Medicine<br>☐Instrumentation | ☐Traditional<br>☐Don't know | ☐herbal application |
| Where did she have the abortion | ☐Home<br>☐Don't know | ☐Government Facility | ☐Private Facility |
| Who performed the abortion | ☐Doctor<br>☐Others | ☐Nurse / Midwife | ☐TBA |
| Did she had Severe Blood loss after abortion: | ☐Yes | ☐No | ☐Don't know |
| If yes, whom/where did she seek care: | | | |
| If no, why: | | | |
| Interventions done to the deceased: | | | |
| *In Early pregnancy*: | ☐Evacuation<br>☐Transfusion | ☐Laparotomy | ☐Hysterectomy |

| | | | |
|---|---|---|---|
| *In Antenatal:* | ☐Transfusion | ☐Version | |
| *In Intra-partum:* | ☐Induction of labour<br>☐Episiotomy<br>☐CS | ☐Augmentation of labour<br>☐Hysterectomy | ☐Instrumental Delivery<br>☐Transfusion |
| *In Post-partum:* | ☐Evacuation<br>☐Transfusion | ☐Manual removal of placenta | ☐Hysterectomy<br>☐Laparotomy |
| Anaesthesia | ☐General Anaesthesia<br>☐Invasive monitoring | ☐Epidural<br>☐ICU ventilation | ☐Spinal<br>☐Local<br>☐Other |
| By whom Anaesthesia was preformed: | _____ | | |
| Job title of the health worker: | | | |
| Date: | ☐☐DD ☐☐MM ☐☐☐☐YYYY | | |

**Section B:** Narrative by other health worker(s) who attended with the deceased woman:

| | |
|---|---|
| Investigator/Interviewer's name: | _____ |
| Date: | ☐☐DD ☐☐MM ☐☐☐☐YYYY |
| Signature: | |

## Annex 4: MMA team Report Form

### MMA team Report Form (To be filled by MMA team)

| | | | |
|---|---|---|---|
| Governorate: | District: | Village: | |
| Name of the investigator (MMA team member): | | | |
| Address: | | | |
| Place of death: | ☐Home | ☐On the way | ☐Other |
| Date of death: | ☐☐DD ☐☐MM ☐☐☐☐YYYY | | |
| Time of death: | ☐☐☐☐am | ☐☐☐☐pm | |
| Age at death (Maternal): | ☐☐ | | |
| Gravida: | _____ | | |
| Stage of pregnancy/delivery (Within 42 days after delivery or abortion) when the death occurred: | | | |
| Condition on Admission (if death occurred at Facility): | ☐Stable | ☐Serious | ☐Brought dead |
| Case Summary: Current pregnancy: (Describe what happened from pregnancy till death, antenatal care, abortion, problem, symptoms, appearance, doctor consulted, Status of admission, hospitalization, investigation, interventions, delivery, … etc., done within this pregnancy) until she died<br>Write narrative : | | | |

| | | | |
|---|---|---|---|
| Status of the newborn | ☐dead | ☐alive | |
| MMA team opinion were any of these factors present: | | | |

| System | **Example** | ☐Yes | ☐No | ☐Don't know | **Remarks /Specify** |
|---|---|---|---|---|---|
| Personal/Family | Delay in seeking help | ☐Yes | ☐No | ☐Don't know | |
| | Lack of Family/Partner support | ☐Yes | ☐No | ☐Don't know | |
| | Harmful traditional practices | ☐Yes | ☐No | ☐Don't know | |

| | | | | |
|---|---|---|---|---|
| | Family Status (poverty) | ☐Yes | ☐No | ☐Don't know |
| | Refusal of treatment | ☐Yes | ☐No | ☐Don't know |
| | Refusal of admission in a facility | ☐Yes | ☐No | ☐Don't know |
| | Consent not obtained | ☐Yes | ☐No | ☐Don't know |
| | Other: Specify | | | |
| Logistical Problems | State of the Residence e.g.: lack of roads, transportation. | ☐Yes | ☐No | ☐Don't know |
| | Lack of transport from home to health care facility | ☐Yes | ☐No | ☐Don't know |
| | Delayed arrival to a referred facility | ☐Yes | ☐No | ☐Don't know |
| | Lack/Weak Referral System | ☐Yes | ☐No | ☐Don't know |
| | Other: Specify | ☐Yes | ☐No | ☐Don't know |
| Facilities Problem | Lack of facilities, equipment or EmOC drugs | ☐Yes | ☐No | ☐Don't know |
| | Weak administration systems/Prolonged Procedures | ☐Yes | ☐No | ☐Don't know |
| | Lack of blood or its products | ☐Yes | ☐No | ☐Don't know |
| | Lack of medical records/ standards/ protocols/ manuals/ guidelines | ☐Yes | ☐No | ☐Don't know |
| | Other: Specify | ☐Yes | ☐No | ☐Don't know |
| Health personnel problems | Lack of human resources | ☐Yes | ☐No | ☐Don't know |
| | Inadequate Staff in charge | ☐Yes | ☐No | ☐Don't know |
| | Lack of Capable specialists and expertise e.g.: Anesthetist, Surgeons, | ☐Yes | ☐No | ☐Don't know |
| | Low performed Health providers e.g.: Untrained, Low degree or education, | ☐Yes | ☐No | ☐Don't know |
| | Lack of on job training or transferring the knowledge, skills, practice to junior staff | ☐Yes | ☐No | ☐Don't know |

| | | | |
|---|---|---|---|
| Other: Specify | ☐Yes ☐No ☐Don't know | | |
| Please describe any factors before arrival at the facility which delayed or affected the woman's condition: | | | |
| Cause of maternal death | Direct obstetric causes (specify) | Indirect obstetric causes (Specify) | Others |
| Recommendations: | | | |
| Investigators/Interviewers' name: | _____ | | |
| Date: | ☐☐DD☐☐MM ☐☐☐☐YYYY | | |
| Signature: | | | |

## Annex 5: Governorate Core Group (GCG) Findings and Report Form

**Governorate Core Group (GCG) Findings and Report Form** (To be filled by GCG team)

| | | | |
|---|---|---|---|
| Name and titles of Governorate Core Group members: | | | |
| 1- | | 2- | |
| 3- | | 4- | |
| 5- | | 6- | |
| Cause of maternal death | Direct obstetric causes (specify) | Indirect obstetric causes (Specify) | Others |
| Final agreed cause of death | _____ | | |
| ICD-10 code cause of death | _____ | | |
| Contributory factors: | Delay I (Health seeking) | Delay II (Transport access) | Delay III (Service Providing) |
| Preventable cause of death: | ☐Yes | ☐No | |
| Was care substandard, in which respects – clinical, health system, or other (Specify): | | | |
| What can be learnt from this death: | | | |
| What recommendations to make things differently/better in future: | | | |
| How are you going to achieve this: | | | |
| Name of MMA core group Chairperson: | _____ | | |
| Date: | ☐☐DD ☐☐MM ☐☐☐☐YYYY | | |
| Signature | | | |

## Annex 6: Other MMA Approaches

**Near Miss Review**

| | |
|---|---|
| **Definition** | The identification and assessment of cases in which a pregnant woman survives an obstetric complication; there is no universally acceptable definition for such cases and it is important that the definition used be appropriate to local circumstances to enable local improvements in maternal care. |
| **Requirements** | Good-quality medical record system, a management culture where life-threatening events can be discussed freely without fear of blame, and a commitment from management and clinical staff to act upon findings |
| **Advantages** | A "near-miss" may occur more frequently than a maternal death, it is possible to interview the woman herself during the review process, and can reduce the likelihood of future maternal deaths through quality improvement |
| **Disadvantages** | Requires clear definitions of severe maternal morbidity, selection criteria are required for settings with a high volume of life-threatening events. |

**Confidential enquiries into maternal death**

| | |
|---|---|
| **Definition** | Confidential enquiries related to maternal deaths are systematic, multidisciplinary and anonymous observational studies of adverse events.<br><br>It aims to identify areas where clinical practice is deficient. |
| **Requirements** | A committee is established, cases for inclusion are identified, assessments are carried out and a report with collated findings and recommendations for action at the policy level is prepared.<br>Simple systems are required to set up an enquiry and well-organized health systems and reporting procedures facilitate the enquiry |
| **Advantages** | Commitment from the bodies involved in high-level planning and policy. They do not necessarily assess all maternal deaths and can draw from representative sample of deaths. Therefore, recommendations can be generalized. Their linkage to policy, as well as perceived prestige and representativeness. It can be conducted at subnational levels (district and governorate). |
| **Disadvantages** | Cannot work well in conditions of poor-quality documentation, lack of time, interest or accountability and poor organization of the health system. Reluctance of overloaded health workers in particular in developing countries. Maternal mortalities in Yemen often occur in community or present to facility at late illness condition resulting in poor information from confidential enquiries. |

## Annex 7: Guiding Ideas

### Guiding Idea 1:

**Hospital based MMA committee:**

In large hospitals and referral ones, MMA at this level can have an internal part where professionals from the same facility constitute a committee to review every maternal death within 48 hours of the event. This committee can be established in large hospitals where deliveries are high. It can be comprised of an obstetrician & gynaecologist, a senior midwife or nurse, anaesthesiologist /anaesthetist, CEO, medical director, pharmacy head and quality officer of the hospital. This committee and its role should comply with that of the MMA team at district level and coordination is a must for the success of such experience. Capacity building in such institutes is fundamental and this should be under the supervision of the NTF and GCG.

The roles and responsibilities of this committee include:

- Develop detailed plan of action.
- Reviews all maternal deaths in the hospital within 48 hours of death notification.
- Devise and implement action points based on findings according to their expertise.
- Keeps the filled tools confidential and ensure it will not be used for any other purpose other than audit purposes.
- Conduct anonymous reviewing of cases to avoid blaming and bias.
- Compiles and reports the findings to core group every month.
- Conduct in-depth investigation of selected cases

**Guiding Idea 2:**

**Suggested report sections for CGC and NTF**

1. Introduction
2. Background of governorate covered by MMA.
3. Characteristics of women of reproductive age in the governorate.
4. Characteristics of births in governorate (number, live or stillborn (fresh vs. macerated), birth weight, gestational age).
5. Maternal deaths by governorate, mother's age (with denominator if possible).
6. Maternal deaths by medical cause of death.
7. Problems leading to death by medical cause and non-medical cause and their frequencies
8. Recommendation to prevent future deaths
9. Review of recommendations from previous year and whether they were implemented or not; if not, why not

**Guiding idea 3:**

Who should be informed about the maternal mortality auditing reports?

The following is a list of possible stakeholders to disseminate the results of audit biannually and/or annually:

- Ministry of Health (all departments).
- Other related ministries (e.g.: MoF, MoLA, MoCSI, MoPIC, etc.)
- Local, regional, and/or national health care planners, policy-makers and politicians.
- Professional organizations and their members, including paediatricians, general physicians, obstetricians, midwives and anaesthetists who are involved at each level.
- Private sector (in the governorates and national association of private sector at national level).
- Health promotion and education experts.
- Academic institutions.
- Local health care managers.
- Local Authorities at governorates and districts levels.
- The media.
- Civil Society Organisations (e.g. YFCA, CSSW, Al-Saleh, YMA, Yaman, etc.)
- All those who participated in the survey.

**Guiding idea 4:**

Dissemination of audit results can be at community, facility and national levels through the following means:

- Team meetings
- Thematic seminars at facilities
- Community meetings
- Radio programmes
- Printed reports
- Training programmes
- Posters
- Text messages
- Video clips
- Professional conferences
- Media
- Press releases
- Websites
- Newsletters
- Fact sheets
- Posters

## Annex 8: Cause of Death Classification

**Direct obstetric deaths**

1. **Early Pregnancy death (EPD) (First 20 weeks of pregnancy)**
   - 1.1. Abortions
     - 1.1.1.Spontaneous abortion and haemorrhage
     - 1.1.2.Spontaneous abortion and sepsis
     - 1.1.3.Spontaneous abortion and trauma
     - 1.1.4.Induced abortion and haemorrhage
     - 1.1.5.Induced abortion and sepsis
     - 1.1.6.Induced abortion and trauma
     - 1.1.7.Ectopic pregnancy
     - 1.1.8.Molar pregnancy

2. **Late pregnancy deaths**
   - 2.1. Ante partum Haemorrhage (After 20 weeks of pregnancy)
     - 2.1.1.APH due to placenta praevia.
     - 2.1.2.APH due to abruptio placenta
     - 2.1.3.APH due to indeterminate causes.
   - 2.2. Obstructed labour/ rupture uterus
     - 2.2.1.Antepartum rupture
     - 2.2.2.Postpartum rupture
     - 2.2.3.Scar rupture
     - 2.2.4.Rupture uterus attributed to oxytocin
     - 2.2.5.Rupture uterus attributed to misoprostol
   - 2.3. Post partum Haemorrhage (PPH).
     - 2.3.1.(a)Primary PPH (birth to 24 hours of delivery)
       - 2.3.1.1. PPH following uterine atony due to hydramnios
       - 2.3.1.2. PPH following uterine atony due to twins
       - 2.3.1.3. PPH following uterine atony due to prolonged or obstructed labour
       - 2.3.1.4. PPH following uterine atony due to multiparity
       - 2.3.1.5. PPH following retained membranes or placental bits
       - 2.3.1.6. PPH following retained placenta with normal placentation

2.3.1.7. PPH following retained placenta with abnormal placentation (acreta/increta/percreta)
2.3.1.8. Traumatic PPH following tears in cervix /vagina / perineum
2.3.1.9. PPH following placenta praevia
2.3.1.10. PPH following abruptio placenta
2.3.1.11. DIC
2.3.1.12. PPH following inversion of uterus.
2.3.1.13. PPH following prior foetal death
2.3.1.14. PPH due to undetermined cause

2.3.2.(b) Secondary PPH (abnormal or excessive bleeding which occurs between 24 hours and 6 weeks postpartum)
2.3.2.1. Secondary PPH due to retained placental tissue
2.3.2.2. Secondary PPH due to sepsis
2.3.2.3. Secondary PPH due to undetermined causes.

**3. Hypertensive disorders of pregnancy**
3.1. Severe Pre eclampsia
3.2. Eclampsia.
3.3. Chronic hypertension with superimposed PIH
3.4. HELLP syndrome
3.5. CVA

**4. Sepsis related to pregnancy and child birth**
4.1. Chorioamnionitis.
4.2. Puerperal Sepsis following normal delivery
4.3. Puerperal Sepsis following caesarean section
4.4. Peritonitis

**5. Complications of anaesthesia**
5.1. Complications following general anaesthesia
5.2. Complications following spinal anaesthesia
5.3. Complications following epidural anaesthesia
5.4. Complications following local anaesthesia

**6. Surgical complications**
6.1. Surgical complications following caesarean section
6.2. Surgical complications following emergency hysterectomy
6.3. Surgical complications following puerperal sterilization

6.4. Surgical complications following sterilization

**7. Transfusion reactions**

7.1. Transfusion reactions

7.2. Reactions following IV fluid administration

**8. Sudden deaths (others)**

8.1. Pulmonary Embolism

8.2. Amniotic Fluid Embolism

8.3. Sudden death due to undetermined cause

**9. Other conditions**

9.1. Peripartum cardiomyopathy

9.2. Suicide due to puerperal psychosis.

9.3. Any other direct cause- specify

**Indirect obstetric deaths**

---

**1. Heart diseases complicating pregnancy**

1.1. Congenital Heart Disease

1.2. Rheumatic Heart Disease

1.3. Complications following valve replacement

1.4. Chronic hypertension (existing before 20 weeks & pregnancy)

1.5. Myocardial infarction

1.6. Dilated cardiomyopathy

1.7. Undiagnosed heart disease

**2. Anaemia**

2.1. Anaemia complicating pregnancy

**3. Endocrine disorders**

3.1. 1. Diabetes mellitus

3.2. 2. Thyroid disease

3.3. 3. Other endocrine conditions

**4. Infectious diseases**

4.1. Meningitis / encephalitis.
4.2. Maternal tetanus.
4.3. HIV / AIDS
4.4. Malaria
4.5. Typhoid
4.6. Tuberculosis
4.7. Tuberculosis and HIV
4.8. H1N1( swine flu)
4.9. Other infections

**5. Liver disorders**

5.1. Jaundice due to hepatitis viruses
5.2. Jaundice due to noninfectious cause
5.3. Hepatic encephalopathy

**6. Renal conditions**

6.1. Acute renal failure due to non-obstetric cause
6.2. Chronic renal failure due to non-obstetric causes

**7. Other conditions**

Bronchial Asthma

Epilepsy

Intracranial Space occupying lesion

Cancer

Haematological causes

Other causes-specify

**Non-obstetric causes**

1. Non obstetric surgical cause (appendicitis, pancreatitis, bowel obstruction, ovarian torsion etc.)
2. Injury due to burns
3. Injury due to assault
4. Injury due to Road Traffic Accident
5. Injury due to other accidents
6. Electric shock

7. Snake Bite
8. Suicide
9. Any other specify

## Annex 9: Guide to categorizing contributory factors

| Non-medical problems | Medical / service problems |
|---|---|
| Lack of awareness of illness danger signs | No health service available or too far away |
| Delay in seeking care due to lack of family agreement | Sought care but no staff were available |
| Geographic isolation | Medicine not available at the facility and must be provided by the family |
| Lack of transportation or money to pay for it | Doctor would not see woman without payment |
| Other responsibilities | Woman was not treated immediately after arriving at the facility |
| Cultural barriers, such as prohibitions on mother leaving house | Health facility lacked needed supplies or equipment |
| Lack of money to pay for care | Staff did not have knowledge/skills to diagnose and treat mother |
| Belief in use of traditional remedies | Had to wait many hours for qualified staff to see mother |
| Dislike of or bad experiences with health care system | No transport available to reach referral hospital |
| | Poor staff attitude |