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Maternal Death Audit as a Tool Reducing Maternal Mortality*

HNPNotes

Introduction

The fifth Millennium Development Goal (MDG 5) is *improving maternal health with a target of reducing the maternal mortality ratio* (MMR) *by three-fourths between 1990 and 2015*. According to the 2010 WHO/UNICEF/UNFPA/World Bank report on global, regional, and country maternal mortality ratio (MMR) estimates, while some countries have made substantial progress (such as Bhutan, Bolivia, China, Egypt, Equatorial Guinea, and Eritrea), others, mainly in sub-Saharan Africa (such as Chad and Zimbabwe) have made insufficient progress or none at all.[1]

Accurately gauging progress on MDG 5 is especially challenging because 109 countries and territories lack civil registration systems that can be characterized as complete, that is, systems that reliably attribute cause of death. Accurate estimates of national MMR require three things:

- complete records of all deaths
- good attribution of causes of death, and
- knowledge of the pregnancy status of women of reproductive age who die.

Even in countries with adequate civil registration systems, special studies have revealed that about 50 percent of maternal deaths go unreported due to misclassifications.[2] An accurate and complete civil registration system depends on the precise identification of cause of maternal deaths that occur at health facilities, those identified by postmortem pathological examinations, and those reported in verbal autopsies in instances when women die outside health facilities.

This *HNPNotes* describes the five approaches for reviewing maternal mortality or ill health, and offers guidance notes for setting up and conducting facility-based maternal death audits.

Why Maternal Death Audits Are Essential

In most countries with high maternal mortality, health facility records are usually deficient. The causes of some maternal deaths in obstetric registers are ill-defined, which makes it difficult to compile the causes of maternal deaths. Yet information on the underlying causes of maternal deaths, drawn from clinical records and from social and health systems, provides the evidence for local decision-making on the interventions needed to reduce maternal morbidity and mortality.

A 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. 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. It is imperative to establish or strengthen maternal death audits in these 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.

In Sub-Saharan Africa, countries that have systematically introduced maternal death audits in the last decade include South Africa, Botswana, Malawi, and Ghana. A recent review of Malawi's maternal death audits found that the District Health Management Teams were providing supportive supervision and that standard protocols for maternal and neonatal care were being used. However, there are shortcomings in Malawi's approach, such as fear of blame, poor recordkeeping, and lack of knowledge and skills for the proper conduct of reviews.[3]

Five Approaches for Reviewing Maternal Deaths and Ill Health

Beyond the Numbers, a 2004 WHO publication, describes five main approaches for ascertaining the

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causes and contributing factors for maternal deaths and ill health.[4] The characteristics of these five approaches are enumerated in Box 1. A facility-based maternal death review entails auditing maternal deaths that occur in health facilities, while a community-based maternal death review (or verbal autopsy) involves interviewing family members about maternal deaths that occur outside health facilities.[5–6] A combination of these two approaches would provide a more complete picture of the number and causes of maternal deaths in a given locality.

A third approach is when an enquiry into maternal deaths is made by a national committee and in a confidential manner. A fourth approach entails investigating "near misses" rather than maternal deaths, that is, events in which a woman has nearly died during pregnancy, childbirth, or postpartum.[7–10] The committee or group that investigates near misses first has to establish what constitutes near misses so that the label is uniformly applied across health facilities. One standard definition of near miss, with uniform identification criteria, has recently been developed by WHO: *A woman who nearly died but survived a complication that occurred during pregnancy, childbirth, or within 42 days of termination of pregnancy.*[11] The fifth approach, a clinical audit, involves systematically reviewing or auditing the obstetric care provided to pregnant women against established protocols or criteria aimed at improving the quality of care. In this *HNPNotes*, the focus is on how to conduct facility-based maternal death reviews. This is described in detail in the next section.

Guidelines for Establishing a Health Facility-Based Maternal Death Audit

A health facility-based maternal death audit entails reviewing all maternal deaths that take place at health facilities. Of the five approaches mentioned, this is the most suitable one to start with in most settings. Staff in health facilities should be encouraged to review every maternal death that occurs at their facility and supported with the necessary resources to do this. Information pertaining to the circumstances leading to each death is collected from the health personnel who attended to the deceased (at the health facility where the women died as well as other referring health facilities). This allows local lessons learned to be utilized in adapting safer clinical practice or overcoming other local barriers to care to enable more deaths to be prevented in future. This type of review should be formalized and incorporated into the routine reporting of services provided at health facilities in due course. Once well established it is then possible to aggregate the lessons learned from several local facilities to provide a more complete picture of the services available in a given local jurisdiction.

In some cases, it is also possible to go back into the community and trace the woman's pathway through her pregnancy until her arrival at the hospital. These community-based audits provide valuable information on other actions at the community level, including education and transport that might save women's lives in the future. Once a health facility-based maternal death audit is well established, it can be extended to include deaths occurring outside the health facilities (through community-based maternal death reviews), so that eventually all maternal deaths in a given geographic area are captured. Additionally, near-miss studies are a useful adjunct, one that appears to be less threatening to health personnel since the women have survived.

Establishing maternal death audits requires setting up a committee, taking cognizance of legal implications, developing notification guidelines, and developing audit forms. These are described next.

Setting Up a Maternal Death Audit Committee

To ensure sustainability, it is best to enlist the support of local authorities and providers of childbirth services by explaining the purpose of setting up a facility-level maternal death audit team or committee at hospitals or health centers. When communicating about this, it is important to emphasize that the process is not designed to apportion blame. Ideally, the Ministry of Health should provide national guidelines on the composition and size of the audit committees, but in the absence of national guidelines the District Health Management Team could provide guidance. Depending on local circumstances, the following could be members of the multidisciplinary committee: obstetricians, physicians, neonatologist/pediatrician, pathologists, laboratory technicians, pharmacists, nurse-midwives, anesthetists, public/community health professionals, hospital administrators, local statisticians, representative of local women's advocacy group, and representative of the local health authority. It is important the committee is kept as small and workable as possible and that each member is an active participant. All too often senior personnel are nominated by their peers but fail to attend the meetings.

The teams should be trained on the guidelines and the use of audit forms, since lack of training has been found to hamper the process.[12] The number of maternal deaths recorded at the health facility could determine the frequency (whether weekly, monthly, or quarterly) of the committee meetings. It is imperative

Box 1. Five approaches for reviewing maternal deaths and ill health

Facility-based maternal death review:

- 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 death review (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 deaths

- 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.

that within 24 hours of any maternal death the committee be notified and an audit form completed by those who attended to the deceased.

The hospital audit committee could also review maternal deaths that occur at smaller health facilities (with low caseloads) that refer complications to that hospital. Based on the reporting channels from the health facility level to the central level, similar committees can be established at higher levels of the health delivery system, resulting for example in district, regional/provincial, and national committees. These higher committees generally provide oversight to the lower-level committees.

The roles and responsibilities of the audit committee are as follows:

- Review all maternal deaths at health facilities;
- Ensure that the recommendations issuing from committee meetings are followed through to improve obstetric services;
- Report the findings (without personal identifying information) to the higher-level committee(s)—district, provincial, or national—and to both the local government administrative office and the civil registration system;
- Provide feedback to lower-level committees;
- Share aggregate statistics with the local statistical office. The MMR is computed as *(number of maternal deaths/number of live births in the health facility) times 100,000*. This statistic should be labeled as a health facility-based MMR, since it excludes deaths outside the health facilities; and
- Provide input into any future revisions of the audit forms and guidelines.

Ethical and Legal Frameworks

Ideally, maternal death audits should be part of the routine supervision and monitoring of maternal health outcomes. However, given the potential for lawsuits, health personnel who attend to the cases under review might be reluctant to participate. Ministries of health are expected to provide the committees with legal backing to prevent the use of findings for litigation. In this regard, consent forms (or disclosure statement) should be administered prior to interviewing family members. After the committee meeting, all notes with identifying information collected for the purposes of the audit should be destroyed. Further, the notes with identifying information should not be shared by electronic means, such as email.

Notification of Maternal Deaths

In order to capture all maternal deaths nationally, notification of all maternal deaths to local authorities or to the central level within 24 hours should be mandatory. However, making maternal death notifiable requires a legal framework to allow cases that are sensitive in nature, such as deaths due to unsafe abortion, to be reported to the local health authorities without fear of retribution.[13] In countries where notification is mandatory, there are prescribed forms for reporting.

Audit Form

In the next section is an example of an audit form that already exists and which can be adapted to local circumstances. It has four sections:

- Section A is to be completed by the most senior health worker who attended to the deceased. This is semistructured and collects information on sociodemographics, events leading to the death, examination and laboratory findings, and possible causes of death and contributory factors. All clinical notes (medical and nursing), laboratory results, partographs, and antenatal and delivery records are pertinent in completing this form.
- Section B is to be filled out by other health personnel who also saw or attended to the deceased.
- Section C is for the interview with the deceased's family members, where such an interview is possible.
- Section D summarizes the findings of the audit committee.

While sections A and B are to be completed within 24 hours of maternal death, the timing for administering section C to family members will depend on local norms. After the mourning period (or possibly immediately after the death), a family member who was with the deceased prior to death or was present at the time of death could be interviewed to obtain more information on antecedents.[14] Community health workers (but not any of the health workers who attended to the deceased) could conduct this interview and should try not to be defensive of the health personnel who attended to the case.

Audit Committee Meeting

The chair, together with committee members, discusses the case with the health workers who attended to the deceased. Health workers from the referring health facilities who saw the deceased could also be invited to the discussion. The committee examines all the factors that led to the death to determine the immediate and underlying cause of death and to identify contributory/avoidable factors. These last factors could be personal, family, community, socioeconomic, cultural, or access-based (e.g., distance, financial, or transport) and could include negligence or the lack of or non-adherence to standardized treatment protocols. The initial cause of the death listed on the death certificate could be revised after this meeting. Additionally, the appropriate International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10) code for the cause of death is assigned.[15] The audit meetings are to be non-judgmental, fair, and unbiased, should not apportion blame, and should be private and confidential.[16]

Utilizing the Recommendations

The essential purpose of establishing an audit system is to improve obstetric service delivery. The recommendations of the meeting must be evidence-

based and should be communicated to health personnel and hospital management for appropriate corrective action. Additionally, the health facility audit committee should report the findings to higher-level audit committees, such as district, regional/provincial, and national committees. These higher-level committees should provide supportive supervision to the lower-level committees and ensure that recommendations of the audit committee meetings are duly implemented to improve the quality of and access to obstetric care.

Conclusion

The importance of establishing health facility-based maternal death audits cannot be overemphasized. Countries with high maternal mortality should endeavor to establish audit committees to ascertain the causes of maternal deaths and ways to reduce maternal morbidity and mortality. When the maternal death audit system is functional, it can then be extended to cover perinatal deaths as well as maternal deaths that occur outside health facilities.

Draft Health-facility Based Maternal Death Audit Form

— this form can be adapted to fit individual circumstances —

THIS FORM MUST BE KEPT PRIVATE AND CONFIDENTIAL AT ALL TIMES AND NO PHOTOCOPIES ARE TO BE MADE. WHEN NOT IN USE IT MUST BE LOCKED IN A SECURE PLACE.

The most senior health worker who attended to the deceased will complete Section A. Additionally, health personnel notes, maternity records, and any pathological findings and autopsy reports could be attached if available. However these records must remain anonymous. Other health workers who also saw or attended to the deceased will fill Section B of the form. Section C is for the interview with the deceased's family members. Section D is for the findings of the audit committee.

Section A

Type of facility: ☐ Private clinic ☐ Health center ☐ District hospital ☐ Provincial/regional/state hospital ☐ Teaching hospital

Operating authority: ☐ Government ☐ Faith-based ☐ NGO ☐ Private for-profit ☐ Other_____

Age: _____
Date of death: _____
Time of death: _____
Place of death:
☐ Home ☐ Health facility ☐ On the way to the health facility

Referred: ☐ Yes ☐ No If Yes, how far (distance) _____
Referred from where_____

Residence: ☐ Rural ☐ Urban

Marital status: ☐ Married ☐ Never married ☐ Separated/divorced ☐ Widowed

Highest level of school attended: ☐ None ☐ Primary ☐ Secondary ☐ Higher ☐ Don't know

Occupation of deceased: _____
Occupation of husband/partner:_____
Religion: _____ (provide appropriate choices to allowed standardized reporting)
Ethnicity: _____ (provide appropriate choices to allowed standardized reporting)
N of previous live births: _____
N of previous stillbirths: _____
N of previous miscarriages/abortions: _____

Main attendant at delivery: ☐ Obstetrician ☐ Medical officer ☐ Nurse/midwife ☐ Traditional birth attendant ☐ other _____

Years of training/experience of the main attendant: _____
Gestation in weeks on presentation to health facility (if applicable): _____
Gestation in weeks at time of delivery or death if undelivered: _____
Days after delivery if postpartum death: _____

Details of this pregnancy

Outcome of pregnancy: ☐ Live birth ☐ Stillbirth ☐ Miscarriage
☐ Induced abortion ☐ Ectopic pregnancy ☐ Died before delivery

Antenatal care: ☐ Yes ☐ No N of visits_____

Place of antenatal care: ☐ Private clinic ☐ Health center ☐ District hospital
☐ Provincial/regional/state hospital ☐ Teaching hospital

Past medical history:_____
Past obstetric history:_____
Please provide a summary of her antennal period, including any problems that might have arisen:
_____

Admission to hospital

Date of arrival (admission) in your facility: _____
Time of arrival (admission) in your facility:_____
Days after delivery on admission if delivered: _____

Clinical details

Describe what happened from the time of admission to this facility until she died:
_____

Please describe any factors before arrival at this facility which delayed or affected the woman's condition (such as treatment from traditional health attendant, lack of transport, inability to pay fees, etc.):
_____

Pregnancy/antenatal care history:
_____

Labor/delivery/postnatal history as well as condition/complications on arrival:
_____

Clinical examination findings, laboratory tests, etc. Attach all laboratory results and postmortem reports (without personal identifying information):
_____

Treatment given (including surgical and anesthetic):
_____

What, in your opinion, was her probable cause of death?

Was this confirmed by autopsy or other pathological diagnosis?
_____

Did you consider any alternative diagnoses?
_____

Please list any contributory factors:

Job title of senior health worker:_____

Date: _____

Section B

Narrative by other health worker(s) who attended to deceased:

_____

Job title of other health worker:_____

Date: _____

Section C

Narrative from family member

Relationship to deceased: _____

Could you tell me about everything that happened during the last illness before (NAME OF DECEASED) death, starting from the beginning of her pregnancy, through her illness and about what happened during the final hours of the woman's death?

Prompt: Was there anything else?

INSTRUCTIONS TO INTERVIEWER –
ALLOW THE RESPONDENT TO TELL YOU ABOUT THE ILLNESS IN HIS OR HER OWN WORDS. DO NOT PROMPT EXCEPT FOR ASKING WHETHER THERE WAS ANYTHING ELSE AFTER THE RESPONDENT FINISHES. KEEP PROMPTING UNTIL THE RESPONDENT SAYS THERE WAS NOTHING ELSE.

Please describe what happened from the start of her pregnancy until she died.

_____

Can you give me more details about the circumstances of her actual death?

_____

What treatment did she get at the health facility or other places where she received treatment?

_____

If no treatment was sought, why?

_____

What do you think was the cause of her death?

_____

What do you think could have changed the outcome and prevented the death of (NAME OF DECEASED)?

_____

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?

_____

Thank you

Section D

Findings of audit committee

Name and titles of audit committee members:

_____

Final agreed cause of death:

_____

ICD-10 code cause of death:_____

Contributory factors:

_____

Was care substandard? In which respects – clinical, health system, or other?

_____

What can be learnt from this death?

_____

What recommendations do you make for doing things differently in future?

_____

How are you going to achieve this?

_____

Chair of Audit committee:_____

Date: _____

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