

HOW TO CONDUCT MATERNAL DEATH REVIEWS (MDR)

Guidelines and tools for
Health Professionals



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GENERAL INFORMATION

I. Introduction

According to the last international estimates published in 2012 (1), 287,000 maternal deaths occur annually worldwide, which represents a 47% decline from levels in 1990. However, 99% of these still occur in developing countries, with 85% occurring in sub-Saharan Africa and South Asia. Among developing regions, sub-Saharan Africa has the highest Maternal Mortality Ratio (MMR), with 500 maternal deaths per 100,000 live births (in comparison to a global MMR of 210).

In addition, for every woman who dies, approximately 20 more experience infection, injuries or disability (2).

Perinatal mortality tends to follow the same geographical pattern as maternal mortality. Every year there are 3.3 million stillbirths and over 4 million newborns die during the first 28 days of life, of which 3 million die in the first 7 days (3-4). In developing countries, about one third of these deaths are related to perinatal complications responsible for birth asphyxia (4).

The main causes of maternal mortality are known, and more than 80% of maternal deaths could be prevented or avoided through actions that are proven to be effective and affordable, even in the poorest countries in the world (5).

The international health community has repeatedly called for action to reduce the large number of preventable deaths and complications from childbearing and governments have formally committed themselves to act in order to achieve this.

Skilled attendance at delivery is advocated as the single most effective intervention for preventing maternal deaths, and the proportion of births attended by skilled health personnel is one of the indicators for the fifth Millennium Development Goal. Access to skilled delivery care is also crucial to prevent stillbirths and to improve newborn survival (3, 6).

It is critical that women with serious complications receive care from a skilled birth attendant in an appropriate environment. This entails ensuring that appropriate drugs, equipment and infrastructure are available.

“Hospital births alone are not enough to save mothers’ lives; high maternal mortality rates have occurred in hospitals where the quality of care is poor” (7, p 5).

“The quality of care provided to the women is a key determinant in maternal outcome and [that] simple changes in practice can save many lives” (5, p 5).



To improve quality of care, the WHO has developed and made available norms, tools, clinical standards and guidelines. These are aimed at ensuring that standardised guidance is available for the treatment and prevention of the major obstetric complications, which are responsible for the vast majority of deaths and disabilities.

However, having guidelines and evidence-based clinical standards in place may not be sufficient, and action is also needed to promote adherence to recommendations. Medical audits may help to maintain or increase adherence to clinical standards and improve quality of care (8). The Maternal Death Review (MDR) is a type of medical audit. It is "a qualitative, in-depth investigation of the causes of and circumstances surrounding maternal deaths occurring at health facilities" (5, p 4).

II. About the guidelines

"Avoiding maternal deaths is possible, even in resource-poor countries, but it requires the right kind of information on which to base programmes. **Knowing the level of maternal mortality is not enough; we need to understand the underlying factors that led to the deaths.** Each maternal death has a story to tell and can provide indications on practical ways of addressing the problem. A commitment to act upon the findings of these reviews is a key prerequisite for success" (5, p 1).

OBJECTIVES

The objectives of these guidelines are:

- To guide and support health professionals in their efforts to assess quality of care in their own service
- To make health staff capable of conducting reviews of maternal death cases that occur in their health facility by following a structured approach.

TARGET AUDIENCE

These guidelines are aimed at people who are working to improve the quality of perinatal care provided mainly at hospital level. This includes clinicians (obstetricians/gynaecologists, anaesthetists, intensive care practitioners, paediatricians and/or neonatologists, general practitioners, midwives, nurses, pharmacists and laboratory technicians), health systems and facility administrators, MNCH programme managers, Non-Governmental Organizations and policy makers.

CONTENTS

The guidelines are divided into two parts.

- The first part provides an overview of medical audit: this includes definitions, the audit cycle and the principles of audit, and types of audits, with particular focus on Maternal Death Reviews (MDRs)

- The second part, itself divided into two phases, explains step by step how to carry out a complete Maternal Death Review (MDR):

Phase I: Preparing an MDR session (6 steps)

- ✓ Step 1: Identifying and selecting MDR participants
- ✓ Step 2: Making standards of good practice available
- ✓ Step 3: Identifying maternal deaths
- ✓ Step 4: Putting together a maternal death file
- ✓ Step 5: Developing a clinical case summary
- ✓ Step 6: Organising an MDR session

Phase II: Conducting an MDR session (6 steps)

- ✓ Step 1: The MDR session: setting the scene and chairing the session
- ✓ Step 2: Re-evaluating results from the previous session
- ✓ Step 3: Presenting a clinical summary
- ✓ Step 4: Reviewing the case (MDR): systematic case analysis, case analysis summary, recommendations and action plan
- ✓ Step 5: Developing an MDR session report
- ✓ Step 6: Planning the next session

III. Medical audits

Everyone involved in the audit process needs an understanding of audit in general. The adoption of a common language is particularly important, as inconsistent terminology can create problems for staff with different professional or academic backgrounds (9). Lack of training and audit skills emerge from the literature as barriers to a successful audit.

DEFINITION AND PURPOSE OF MEDICAL AUDITS

Audits are one of the mechanisms that can help health professionals to maintain or improve quality of care and to provide the best possible services to patients.

Audit is described as a systematic and critical analysis of quality of care in the broadest sense, which assesses the impact of procedures for diagnosis and treatment on patient outcomes (10, 11). Essentially, it consists of comparing the actual procedure with a standard. In 2004, the WHO recommended the introduction of medical audit in all maternity facilities (1). Conducting audits was presented as a useful way of improving the management of obstetric emergencies (2-4, 12-14), although its impact on the survival of mother and child has never been clearly demonstrated (15).

Medical audit is an internal process which relies on a series of hypotheses, as described by P. Bailey et al. (16). According to these authors, conducting effective audit sessions can enable a maternity facility team to reduce maternal case fatality and perinatal deaths, to better meet mothers' needs, and to increase service use. This is achieved through the improvement of practice, more efficient use of resources, and the boosting of staff morale and motivation.

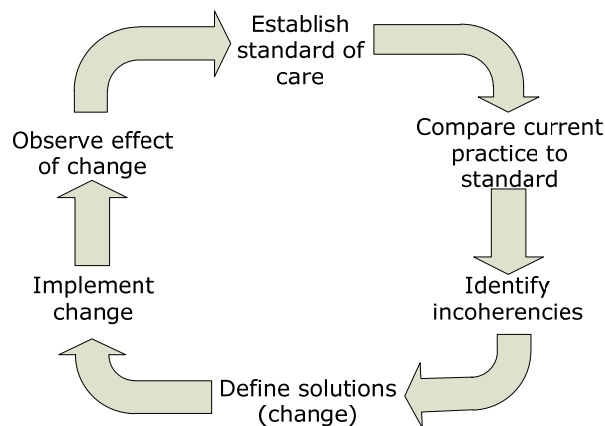
Audit is a useful monitoring tool which can be used to identify areas of substandard care that need to (and can be) improved, and to implement the changes needed in order to meet agreed standards of care in facilities.

THE AUDIT CYCLE AND THE PRINCIPLES OF MEDICAL AUDIT

Classically, an audit is a systematic process which can be visualised as a cycle consisting of several steps. These are: establishing best practice, assessing care against standards or criteria, taking action to improve care, and monitoring to sustain improvement (16). As the process repeats itself, subsequent cycles can be imagined to overlap and spiral upwards, aspiring to ever higher levels of quality. The different stages are illustrated in Figure 1. In order for the 'audit loop to be closed', changes in practice should be implemented and then re-audited to ascertain whether improvements in service delivery have taken place.

Before performing an audit, health professionals need to identify best practices which will serve as standards of reference (Figure 1). Standards are explicit statements of how a patient should be managed. They facilitate the identification of shortcomings by providing a description of the care that ought to have been given, against which the care that was actually given can be compared (16).

Figure 1. The audit cycle



Once gaps in care provision have been identified, it is possible to define solutions for the problems which are likely to have the most significant impact on maternal and neonatal outcomes. The next steps are to implement solutions and to follow up on implementation, in order to verify that the problem has been solved (and observe the effect of change).

It is possible for a new audit cycle to start by addressing the same problem if it has not been solved, or a new problem can be tackled.



Audit is a process based on the following **principles**:

- The search for improvement is based on the results of audits
- There is adherence to the evidence base in the identification of standards of good practice
- The process is not punitive = “no blame”
- Confidentiality is respected = “no name”
- Audits are not daily meetings for reviewing cases recently admitted

For an audit to be feasible, two elements are essential (16):

- The existence of standards of good practice
- The availability of good quality records of clinical management. If records are missing or poorly kept, it may be difficult to conduct an audit, on the basis of the principle: “if it is not recorded, it did not happen”.

TYPES OF MEDICAL AUDIT

Several approaches can be adopted in order to study maternal deaths and cases of severe morbidity, and to assess quality in clinical practice (5). The objective of all of them is to reduce maternal and neonatal mortality and morbidity by improving the quality of care provided.

The following approaches have been developed:

- At community level: “Verbal autopsy”
- At health care facility level: individual Maternal Death Review (MDR), individual case review of severe morbidity (“near miss”), and criterion-based clinical audit (CBCA)
- At regional or national level: confidential enquiries into maternal deaths.

The features of each approach are summarized in Table 1. **MDRs (and Near-miss) are explained in more detail in the following sections.**

Other types of audit are described in more detail in the WHO reference book “Beyond the numbers: Reviewing maternal deaths and complications to make pregnancy safer”, published by the WHO, Geneva, in 2004 (5).

COMMUNICATION STRATEGIES – RIGHTS-BASED AND GENDER-BASED APPROACHES

It is recommended to organise team-building sessions, including coverage of communication strategies, before starting MDR training.

A brief overview of sexual and reproductive health and rights and an interactive session (role play) on gender and health are also recommended. The objective is to raise awareness on how gender affects access to health care services, staff attitude towards women and the quality of care individuals receive, and to encourage staff to view events through a “gender lens” when reviewing cases.

Table 1: Summary of audit approaches

Approach name and health system level	Definition	Advantages	Disadvantages
Verbal autopsy = Community	Investigation into medical causes of death and contributing factors for women who died outside a medical facility	<ul style="list-style-type: none"> - Explores medical and non-medical factors, thus more comprehensive - Involves family and community 	<ul style="list-style-type: none"> - Medical causes are not reported with precision - Factors are subjective - Potential disagreement in the reporting of causes - Risk of underreporting for early pregnancy deaths and misreporting of indirect causes
Maternal Death Review = Health Facility	In-depth investigation into the causes and circumstances surrounding maternal death	<ul style="list-style-type: none"> - Obtains a more complete picture of the death - Not expensive - Provides good opportunities for learning - Stimulates the setting of standards 	<ul style="list-style-type: none"> - Not as systematic as clinical audit - Difficult to trace community factors - Lack of whole population data
Individual Near Miss case review = Health Facility	Identification and assessment of cases in which pregnant women survive obstetric complications	<ul style="list-style-type: none"> - More frequent cases allow quantification - Less threatening to health providers - Patient can be interviewed - Provides direct feedback 	<ul style="list-style-type: none"> - Ignores community - Needs elaborate tools and clear definitions - Case ascertainment may require a long time
Criterion-based clinical audit = Health Facility	A systematic review of care against established criteria, aimed at improving quality of care	<ul style="list-style-type: none"> - Less threatening to health providers - Provides direct feedback - Involves less subjective assessment - Highlights deficiencies in in-patient records and record storage 	<ul style="list-style-type: none"> - Ignores community - Does not provide a complete overview of all maternal deaths - Requires that an appropriate set of criteria be available/developed
Confidential enquiries into maternal deaths = Regional/National	Multi-disciplinary anonymous investigation into all or a sample of maternal deaths, carried out at regional or national level. It identifies the numbers of deaths, causes and avoidable or remediable factors associated with them	<ul style="list-style-type: none"> - Makes general recommendations - Provides a more complete picture of maternal mortality - Useful for advocacy - The absolute number of maternal deaths is often not very high, allowing in-depth investigation 	<ul style="list-style-type: none"> - Provides only quantitative data - The analysis of cases can be complex and time-consuming if there is a high number of deaths - Can lack depth if it focuses only on medical aspects - Requires commitment from all participants and may be resource-intensive

MATERNAL DEATH REVIEWS

Facility-based case reviews of maternal deaths are the simplest of the various audit approaches and are now carried out routinely in many facilities (5).

Definitions of maternal mortality

A **maternal death** is defined as “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.” (13)

Maternal deaths are subdivided into two groups (21):

- *direct obstetric deaths*: direct obstetric deaths are those resulting from obstetric complications of the pregnancy state (pregnancy, labour and the puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above.
- *indirect obstetric deaths*: indirect obstetric deaths are those resulting from previous existing disease or disease that developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by physiologic effects of pregnancy.

A **pregnancy-related death** is “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death (1).

A **late maternal death** is “The death of a woman from direct or indirect obstetric causes, more than 42 days, but less than 1 year after termination of pregnancy.” Despite being caused by pregnancy-related events, these deaths do not count as maternal deaths in routine civil registration systems (1).

Given that the Maternal Death Review approach focuses on hospital deaths, these guidelines apply to the review of deaths which fall within the definition of “maternal death”. Deaths defined as “late maternal deaths” and those due to accidental or incidental causes, classified as “pregnancy related”, are not included. It is recommended that the WHO’s *Application of ICD-10 to deaths during pregnancy, childbirth, and the puerperium: ICD-Maternal Mortality* (ICD-MM)¹ be made available to participants (21). This document is based on the 10th revision of the ICD (ICD-10) and its coding rules. It is intended to facilitate the consistent collection, analysis and interpretation of information on maternal deaths². Its principles should be applied during the process of categorizing all data relating to deaths, which may be collected through civil registration, surveys, hospital information systems, verbal autopsies, confidential enquiries and other special studies.

¹ Available at http://apps.who.int/iris/bitstream/10665/70929/1/9789241548458_eng.pdf

² For instance, this document is useful to help identify and classify conditions which are unlikely to be causes of death but may have contributed to a death. It also clearly states which causes should be counted as direct or indirect maternal deaths.

Definition and principles

A facility-based Maternal Death Review (MDR) is a “**qualitative, in-depth investigation of the causes of, and circumstances surrounding, maternal deaths which occur in health care facilities**” (5). It focuses particularly on tracing the path of the women who died through the health care system and within the facility. The aim is to identify any avoidable or remediable factors which could be changed, in order to improve maternal care in the future. This information should, preferably, be supplemented by data from the community, but this may not always be possible.

A health facility-based maternal death audit entails **reviewing all maternal deaths that take place at the facility**. This will influence the number and frequency of MDR sessions.

The objective of the MDR is to collect information on all maternal deaths, in order to gain as complete as possible a picture of the causes and circumstances associated with intra-hospital maternal deaths. A longer term objective is to examine all intra-hospital deaths in the country and monitor causes and circumstances at the national level. It is expected that the results of audits will contribute to assessing and shaping policies aimed at reducing maternal and neonatal mortality.

Eventually, it is recommended that this type of review be formalized and incorporated into the routine reporting of services provided at health facilities.

It is important to involve all professionals who took part in managing the case. This can contribute to beneficial processes such as the **multidisciplinary development and ownership of local protocols, and the improvement of teamwork**.

Although reviewing each case separately is important and may yield useful individual lessons, from time to time it is useful to pause to examine local factors and avoidable causes which may have affected several deaths. This may point to the need for larger-scale service reconfigurations or for the improvement of local protocols. It is therefore helpful to aggregate these and review them on a regular basis.

The review process requires cooperation by those who provided care to the woman who died, and their willingness to report accurately on the management of the case. The success of data collection may depend on how issues of confidentiality and impartiality are handled. Staff involved need to be certain that the review process does not involve apportioning blame for anything that happened. They need to know that all findings will be recorded and reported completely anonymously, in accordance with the “**no name, no blame**” principle.

During the session, the anonymity of those involved in the management of the audited cases is difficult to maintain, given that the audit is conducted by the professionals themselves. However, the **information and issues which emerge during the review should not be disclosed outside the team**.



Advantages and disadvantages

The advantages of MDRs include:

- Improved professional practice: the MDR helps to identify where clinical care was below standard, which actions can be taken in order to avoid repeating the same mistakes, and how to obtain the resources necessary to provide high quality care.
- Improved training: changes can be brought to curricula, or more appropriate teaching methods and supervisory/feedback mechanisms can be introduced.
- Improved resources: by using the findings to persuade managers to act upon identified resource needs related to staffing, equipment and drugs.
- Advocacy: by providing feedback to the community, nongovernmental organizations (NGOs), and public health authorities in relation to any community-related factors. Feedback of this type might, for example, result in the formation of local self-help groups, which can provide either cash or transport for those in urgent need of obstetric care.
- Cost-effectiveness: a facility-based maternal death review is usually less expensive to conduct than other audit methods.

The disadvantages of MDRs include:

- The lack of whole population data: the MDR may not provide a complete picture of maternal death in a given population, particularly in countries or areas where most women die in the community.
- Data on community factors which contributed to the woman's death in the facility may be difficult to obtain (unless specific information is routinely collected).
- The results are not as rigorous as in the case of clinical audit.
- A facility-based maternal death review is not as systematic as clinical audit and can generate a large volume of information that can be difficult to interpret and synthesize.

THE CONCEPT OF “NEAR-MISS CASES”

A ‘near miss’ or case of severe acute morbidity is defined as: “any pregnant or recently delivered woman (within six weeks after termination of pregnancy or delivery), in whom immediate survival is threatened and who survives by chance or because of the hospital care she receives” (5, p 17). Women who die often have the same organ system failures or dysfunctions as are seen in near miss cases. The typical organ system dysfunction can be clinically detected and has been defined as severe acute maternal morbidity (SAMM). The logical assumption is that the underlying disease processes causing SAMM are the same as those that cause maternal death. This implies that it is possible to study the circumstances that lead to women developing SAMM as a proxy for studying maternal deaths, thus allowing for a more rapid assessment of maternal care (17).

FACTORS INFLUENCING AUDIT (18)

Facilitating factors

1. The availability of sufficient resources, equipment and staff to ensure a minimum level of quality of care in the facility.
2. The commitment and support of authorities, management and administration in order to assist the team and mobilize resources.
3. The willingness and commitment of the maternity team. All staff should feel motivated to improve the quality of the care they provide. They should be prepared to call their own practice into question, but they should also be involved in decision-making.
4. A supportive and non-threatening environment where constructive criticism is possible.
5. The provision of support and training opportunities for hospital staff, enabling them to acquire the knowledge and skills necessary to conduct audits.

Obstacles

6. Personal beliefs and a priori suspicions, doubts, fear of criticism and lack of confidentiality. These can be exacerbated by a threatening or repressive environment.
7. Poor leadership in conducting the MDR
8. The failure to involve the authorities and management (those who have the power to make decisions which can improve the work environment)
9. The expectation of financial incentives
10. The lack of didactic support (e.g. teaching material and manuals)
11. The lack of financial resources to support the audit
12. The poor quality of records and insufficient documentation
13. Too many participants.

Risks

14. Discouraging health personnel if the proposed changes do not take place (disillusionment)
15. Generating false or inaccurate information if the audit is perceived as threatening (lack of trust and disclosure)
16. Damaging relationships between staff (especially if the basic audit session rules are not respected).



GUIDELINES: MATERNAL DEATH REVIEWS STEP BY STEP

Phase I. Preparing an MDR session in 6 steps

STEP 1: IDENTIFYING AND SELECTING MDR PARTICIPANTS

Selecting the members of the MDR Committee:

Committee members should be selected from a variety of backgrounds: they can include health professionals, administration and management personnel, staff from peripheral health facilities referring patients, and community members. An MDR committee should include between 6 and 10 people (maximum 12).

Members are requested to have:

- A basic understanding of the maternal death review process (one barrier to successful auditing highlighted in the literature is the lack of training in audit skills)
- An understanding of and commitment to the plans and objectives of the audit process
- An understanding of what is expected of the committee
- An interest in and commitment to investigating maternal deaths, and the ability to devote sufficient time.

The committee's main responsibility is organizing the reviews, as well as disseminating the results and monitoring the implementation of recommendations.

Someone with experience and authority should be selected to take overall responsibility for coordination.

The statutes and internal regulations of the committee should be established.

Selecting the three main facilitators for the MDR session:

1. The **Case Presenter**: this is the person responsible for identifying maternal deaths, gathering all information concerning cases, and summarizing and presenting clinical cases during the MDR session.

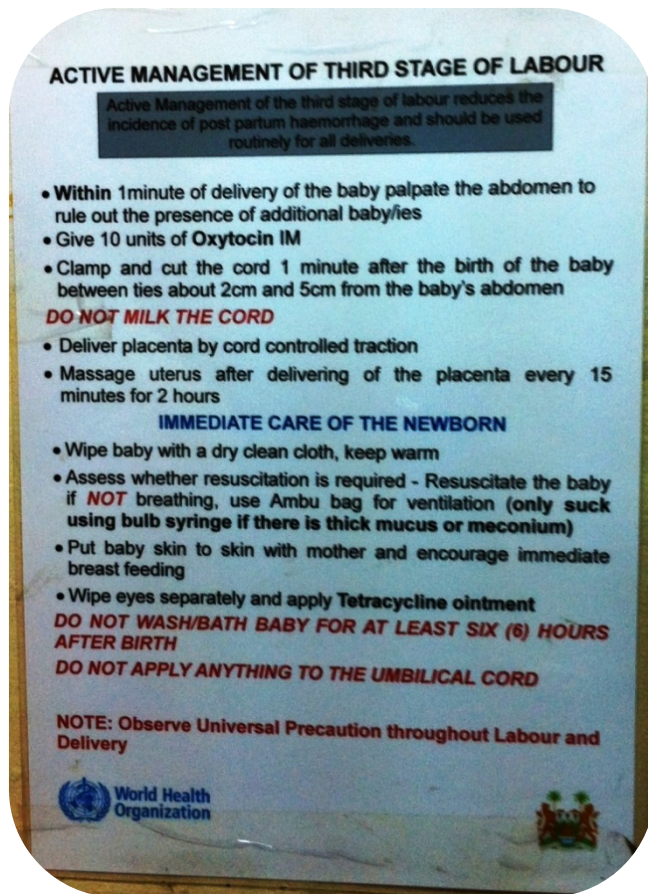
The Presenter needs to demonstrate tact, sensitivity and precision when collecting data through interviewing people involved in the care of a maternal death case. S/he must be able to encourage staff to give a free account of events and to conduct the interview in a non-judgmental way. S/he must ensure that information collected is handled confidentially.

2. The **Moderator**: chairs the session and the debates.

The Moderator must be able to stimulate debate, to put participants at ease, to encourage open discussions and to treat all participants fairly and with equity. The Moderator is also responsible for making decisions such as stopping the case review because of problems for example in the group.

3. The **Secretary**: summarizes the case analysis and produces a report of the session.

As far as the selection of facilitators is concerned, it is advisable to appoint the same people for the first three or four sessions. However, others must also be trained, to ensure that there is more than one person available to take on the various roles over time.



Selecting participants in the MDR session:

The number of participants in each MDR session should not be too high (maximum 15 to 20 participants), otherwise there is a risk that discussions may become unfruitful, or participants may feel uncomfortable. Instead, during the MDR session each participant has an equal right to express their opinion. If possible, the physical space for the session should facilitate this, for example participants could all be sitting around the same table.

The participants who should be involved in the MDR session are:

1. Clinicians: obstetricians/gynaecologists, anaesthetists, midwives, nurses, intensive care practitioners, paediatricians and/or neonatologists, general practitioners, pharmacists and laboratory technicians.
2. Representatives of the hospital administration and management.
3. Representatives of the health facilities which refer patients to the hospital.

STEP 2: MAKING STANDARDS OF GOOD PRACTICE AVAILABLE

Clinical standards define the minimum acceptable level of quality of care. They reflect "the best way to treat patients" according to scientific evidence, the opinion of experts and with consideration of the local context and resources. If there are no explicit standards available, the risk is that it may be difficult to reach a consensus on the appropri-

ateness of the care provided, especially if professionals have different ways of practising due to different training backgrounds.

Clinical standards are explicit statements of how a patient should be managed. Their presence helps professionals to identify gaps and highlight deficiencies, because it is possible to compare the care that was given to patients with the care that ought to have been given (16).

In most hospitals, standards are already available from a variety of sources, both national and local. Examples include national standards or guidelines issued by the Ministry of Health, standards of conduct issued by professional organisations, and international guidelines such as “Managing Complications in Pregnancy and childbirth: a guide for midwives and doctors” (23).

STEP 3: IDENTIFYING MATERNAL DEATHS

1. **All maternal deaths should be identified:** MDRs entail reviewing all deaths that occurred at the facility during a defined period of time.
2. When conducting a facility-based **MDR for the first time**, it may be necessary to incorporate deaths dating from some time back. No definitive advice can be given about how far back to go, but if there are few deaths it will be necessary to go back far enough to identify a minimum of 2 or 3 cases.
3. Maternal deaths are usually identified through health facility registers, so it is advisable to examine:
 - Hospital admission and discharge registers
 - Operating theatre register
 - Delivery ward register
 - Intensive care unit register
 - Mortuary register
4. Special attention must be given to identifying cases which may be missed, such as those that:
 - Occurred in early pregnancy
 - Are due to indirect causes
 - May have been misclassified/not recorded.
5. A countercheck can be performed by compiling a list of all deaths which occurred at the facility of women aged 15–49 years, through the examination of all discharge registers. Once the list is compiled, those deaths that are not the result of either direct obstetric causes or of conditions aggravated by pregnancy can be eliminated, once the relevant medical records have been reviewed.
6. In facilities where maternal deaths are relatively few in number (or where there has been no death over a period of three months), the cases to be reviewed may include near-misses.

STEP 4: PUTTING TOGETHER A MATERNAL DEATH FILE

The circumstances surrounding each death emerge through the collection of data from multiple sources, in order to gain as complete and accurate picture as possible. The Presenter can achieve this by:

1. Collecting written information from the following sources:
 - Ward and operating theatre registers
 - Antenatal cards
 - Inpatient medical records and files
 - Emergency department records
 - Admission and discharge registers.
2. Interviewing staff involved in the patient's care to supplement information gaps, or to seek clarifications and check inconsistencies.
3. Where possible, interviewing other relevant people such as the woman's husband or other relatives.
 - ➔ The aim is to identify and interview the two or three people with the most direct knowledge of the case, and to avoid collecting information that is second-hand. If the relevant people are either frightened or feel guilty, they may be reluctant to speak. However, if approached with tact and perseverance, it is often possible to convince them. In some circumstances, it may be that a group discussion is the most appropriate way of obtaining the desired information.
4. Ensuring that all documentation is anonymised
5. Where feasible, collecting data in the community about the circumstances of the pregnancy and factors influencing the decision to seek help. This kind of investigation is not possible everywhere and for every death. It involves sending a data collector to the woman's home after the death, which requires a much more sophisticated and expensive approach, and a high degree of sensitivity. In many situations, these conditions are difficult to achieve. One suggestion is to collect community data only in selected cases where it seems particularly important to do so. In any case, it is useful to ensure that information on community factors is routinely collected when women are admitted to the facility.
6. Once the maternal death file has been put together, developing a clinical summary (see Step 5: 'Developing a clinical case summary').

STEP 5: DEVELOPING A CLINICAL CASE SUMMARY

1. The clinical summary is a 5-10' report of the most significant events that took place from before the woman's admission to the health facility until her death. It includes data on the patient's obstetric history.
2. All information presented is drawn from the maternal death file assembled by the Presenter prior to the session itself.
3. This summary "briefly" outlines the main steps in the management of the patient from prior to admission (was she referred? under what circumstances?) until death.

4. A tool (*“MDR: Clinical summary form”*) is proposed on page 26 which can facilitate the notifying/capturing of all information necessary in order to obtain a picture as complete and accurate as possible. The Presenter should:
 - a. Fill in all parts of the form
 - b. Ensure that all information is anonymous (including the names of the patient, the health centre, and health workers)
 - c. If some sections cannot be filled in, explain why. For some deaths, it may be impossible to obtain much information. However, these deaths should not be omitted. On the contrary, a special effort should be made to find out why so little information is available.
5. At the start of the session, the Presenter gives the audience an oral narrative summary of all the information gathered and summarised on the form.
6. The narrative summary (which can be written down in the last section of the form) aims at presenting facts *without expressing any judgment on the appropriateness of actions undertaken*. The style of the summary should be comprehensive and precise.
7. An example of a narrative case summary is provided on page 29.



Maternal Death Review: Clinical summary form

Date of MDR:	MDR session N°:
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Patient code:	Patient Age:	
Marital status: married/cohabitant	divorced	single
Gravida:	Para:	Live children:
Number of previous caesarean sections:	Date of last CS:	
Number of ANC visits in this pregnancy:		
Risk factor(s)/complications detected during this pregnancy/labour:		

If delivered/aborted before admission:		
Date:	Duration of amenorrhea:	Alive baby?
Place of birth/abortion?	Assisted by:	
Complications occurred?		

If pregnant on admission:
Duration of amenorrhea:

Referred from another institution?	Type of institution?
Reason for coming to hospital:	
History of the referral/process of reaching the institution:	
How does the woman's status in the community affect the process leading up to admission in this particular case?	
Date and time of admission:	
Main reason for admission:	

Initial clinical assessment/Ultrasound/laboratory findings at admission:

Diagnosis made at admission:

Summary of the case evolution if complication(s) occurred after admission:

Sequence of events if abortion/delivery occurred:

Complications:

Clinical assessment/Ultrasound/laboratory findings:

Diagnosis:

How does the woman's status in the community affect the process after admission in this particular case?

Main treatment(s) given:

Time between diagnosis of complication and appropriate treatment:

Complementary tests and laboratory results after treatment

Summary of case evolution and monitoring put in place (t°, BP, Pulse, Bleeding):

Date of death: Time elapsed between complication and death:

Cause of death notified in records:

Pregnancy outcome (Live birth, SB, Early death, Miscarriage):

Other information available (from family, health centres, community, etc....)

Summary of the case, to be presented to the team:

Maternal Death Review: Narrative summary example

Primigravida, 38 years old, admitted at 6 pm with blood pressure of 220/110, lower limb oedema, uterine fundus height of 31 cm, closed cervix, no uterine contractions, and foetal heart not heard. Following assessment, the patient was transferred immediately to the delivery room where she had a first eclampsia fit. When the crisis occurred, the ICU physician was around and the gynaecologist arrived quickly. Management started without delay, a urinary catheter and intravenous line were placed and the patient was intubated; antihypertensive treatment was then started in the delivery room. Nephressol was administered every 10 minutes by injection in combination with an oral tablet of Aldomet. The patient was transferred to intensive care unit. Laboratory investigations were requested (WBC, electrolytes, glucose, urea and creatinine) and this was recorded in the patient record, but no results could be found. An ultrasound was requested to assess gestational age and foetal viability. This was done at 6.40 pm in the X-Ray room (located close to the intensive care unit). The US revealed a live foetus of 37 weeks and the decision to perform a caesarean section was taken. A caesarean section was performed in the central block at 7.30 pm. The gynaecologist extracted a live infant weighing 2300g (Apgar 6), who was transferred to the paediatric ward. During the post-operative period, vital signs were hardly monitored at all (BP taken three hours after surgery). The patient remained in intensive care in coma state and died 26 hours after admission.

STEP 6: ORGANISING AN MDR SESSION

1. The schedule of sessions is decided and reviewed during each session. Participants are invited in good time (one or two weeks before a session) by the MDR committee coordinator, if possible by letter.
2. It is recommended to review no more than 2 cases per 2-hour session, however the first sessions may last longer.
3. The frequency of sessions depends on the number of cases to be reviewed. There should be at least one session per trimester (if no death occurs during this period, near-miss cases are selected). If a large number of deaths occur, MDR sessions are organised monthly or more frequently. The aim is to review every death which occurs, and to hold at least one session per trimester.
4. Venue for the session: the meeting space should be arranged in a way that facilitates discussion (e.g. all members should sit around a big table, rather than be seated in rows one behind the other), and everyone should be able to hear what is being said.

Phase II. Conducting an MDR session in 6 steps

STEP 1: THE MDR SESSION: SETTING THE SCENE AND CHAIRING THE SESSION

The Moderator chairs the session and facilitates discussion and debate.

The Moderator reminds participants of the principle of confidentiality, and that a non-recriminatory atmosphere must be maintained so that discussion can be honest and without fear of blame. Ground rules are elaborated by the MDR committee beforehand, and participants are reminded of them at the beginning of each session (Box 1).

The names of all participants are registered on a list with the date and the audit session number (a template for such a list, “**Maternal Death Review: List of participants**”, is provided on page 26).

The list circulates at the beginning of the session: each participant is invited to write her/his name, qualification and place of work.

Box 1. Example of ground rules (audit charter)

The medical audit consists in a systematic and critical analysis of the quality of care by comparison to defined standards (norms and care protocols). It enables the members of a team to discuss and question or improve certain practices. The audit must never be used to sanction a member of staff. Its purpose is to propose recommendations and actions aimed at avoiding in future the deficiencies or errors observed.

We, staff of the maternity of the hospital ‘Secteur 30’, promise to respect the rules of good practice that follow:

1. To arrive on time for audit sessions.
2. To respect the statements and ideas of everyone.
3. To respect the confidentiality of the team discussions. Information and problems raised during the audit must not be communicated outside the team (friends, relatives, colleagues in other health departments, etc.).
4. To participate actively in the discussions.
5. To accept discussion and debate among participants without verbal violence.
6. To refrain from hiding or falsifying information that could be useful in understanding the case being audited.
7. To try as much as possible (because it is not easy) to accept questioning one’s own actions.

Ouagadougou, 25 February 2004

Staff of the maternity unit of the district hospital ‘Secteur 30’

Source: Richard et al. 2008 (24)

STEP 2: RE-EVALUATING RESULTS FROM THE PREVIOUS SESSION

This step is not applicable to the first MDR session being held in a facility.

This evaluation is the step that closes the loop of the audit cycle, however it is not the end of the process. ***This step is crucial in order to assess whether the recommendations proposed during the last MDR session have resulted in actions and change.***

In addition, periodically, the team may proceed with an evaluation of the review process as a whole, to assess its contribution to improving quality of care. The following aspects should be considered:

- The degree of implementation of planned activities and the need for further action. A tool for this is provided (**MDR: Session report form**, pages 36-37).
- The improvement of case management, which can be estimated through the observed reduction in the previously identified dysfunctions and obstacles to good care.

The action period, i.e. the time between the MDR session and the implementation of actions/change, may also be assessed.

These regular assessments, resulting in timely and appropriate decision-making, can consolidate improvements and reduce barriers to providing high quality care.

STEP 3: PRESENTING A CLINICAL SUMMARY

The Presenter gives participants an oral case summary, as prepared during Phase I, step 5 (page 19).

The summary contains all information gathered, which is presented in narrative form.

After the presentation of the case summary, the main facts are analysed by participants (Step 4, page 27).



Maternal Death Review: List of participants

Date of audit:	Audit session N°:
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N°	Name	Qualification	Place of work

STEP 4: REVIEWING THE CASE (MDR)

Step 4.1: Systematic case analysis

The purpose of the MDR session is to **fully understand the chain of events related to the case**, identify the main problems in the management of the case from the time before admission to death and come up with solutions to correct them. In addition, the MDR will help to clarify the most likely medical cause(s) of death and the circumstances/factors that might have adversely affected care (e.g.: shortage of drugs).

Positive aspects (strengths of the maternity unit) observed in the care provided should also be identified and acknowledged.

During the analysis process, at each step, it is useful to systematically examine:

- The reliability of the information
- The appropriateness of diagnostic or therapeutic procedures (according to clinical standards)
- The quality of the monitoring of the patient's condition (temperature, blood pressure, pulse, bleeding, etc.)

For a better-structured and more systematic discussion which addresses all the points and stages in the case management, it is advisable to use an analysis grid for medical audits.

A template tool is provided below, which can facilitate a systematic and exhaustive analysis of the case (*"MDRs: Grid Analysis of Clinical case management"*, pages 31-33).

The grid reviews all stages of patient's route from before admission until death. The aim is to:

- **Identify the main problems** at the various steps in the grid:
 - ✓ Itinerary before admission: transfer conditions, transfer delay, referral letter, etc.
 - ✓ Admission: quality and delay in the first assessment, quality and delay in the provision of relevant care, etc.
 - ✓ Diagnosis: adequacy/reliability of diagnosis, delay in diagnosis, relevance of all clinical tests requested, etc.
 - ✓ Treatment: adequacy of treatment, delay in delivering care, etc.
 - ✓ Continuity and monitoring of care: quality and conditions of monitoring, etc.
 - ✓ Death: who informed the family? In what way? Did the team provide support to the family?

Rather than merely describing events, participants are invited to explain and make the case for why a procedure or an act should be considered to be adequate or inadequate, by referring as far as possible to the established standards of good practice.

It is important to stress that the team is not necessarily required to find a cause or solution to all problems during a single session. Dysfunctions and their causes should be prioritized, and energy should be devoted to solving the most significant problems and those for which the implementation of a solution is feasible. Moreover, when analysing the causes of a problem, it may happen that the team is unable to come up with a solution. In this case, it is best to schedule another meeting with the persons concerned, or to designate someone to do research on the prob-

lem and present results to the team at the next meeting, in order to make appropriate recommendations.

- **Identify the causes of problems:** for every procedure or act qualified as inadequate, participants are invited to investigate what its causes and/or related factors may be. The cause may be related to:
 - ✓ Personnel: qualification, skills, availability, attitude, etc.
 - ✓ Drugs, supplies and equipment: availability, accessibility, etc.
 - ✓ Protocols: availability, knowledge, understanding, use, etc.
 - ✓ Management/Care organization: coordination, communication, etc.;
 - ✓ Patient and/or his family: financial accessibility, misunderstanding, willingness, etc.

The distinction between a problem or dysfunction and its cause may not always be obvious. The dysfunction is the "fact" or "the care that is not adequate" and the cause is "the reason for the problem to happen". For example: "the delay in starting treatment" is the dysfunction, and "out of stock drugs" is the cause.

Using this grid may appear to be tedious, especially when progressing point by point in the discussion. However, its function is not to describe the various stages all over again, but to focus on the arguments for identified dysfunctions. Moreover, once this point by point approach has become familiar, the Moderator can move away from it gradually, while respecting its spirit and remaining systematic.

The Moderator must be careful when analysing causes related to staff behaviour (delay in the arrival of the doctor on call, lack of competence, etc.). Staff involved will normally be uncomfortable discussing these issues. This is normal, especially in the beginning when confidence is not yet well-established within the group.

- **Identify causes of death**, as a final step, by:
 - ✓ Reviewing the medical cause of death and identifying the various factors/events that may have contributed to the case fatality
 - ✓ Comparing the cause of death which was documented in the patient's record with their own findings
 - ✓ Determining whether or not the death was preventable³.

Step 4.2: Case analysis summary

Based on the discussion, the Moderator summarizes the main points by presenting to the audience:

1. The main problems identified in the case management

³ A death can be considered preventable if an action currently feasible in the local health care system or in the community could have prevented it. For example, these include actions that would have prevented inadequate treatment from being given, or inappropriate or inadequate care provision, late diagnosis or therapeutic intervention, factors on the part of the patient (1st delay), refusal of care, professional errors, lack of diagnosis, distance, etc. If there is no evident health care system dysfunction or delay in the uptake of care by patients, the death is considered unavoidable. An example of an unavoidable death could be, for example, a death from an anesthetic accident (anaphylactic shock), organ failure due to a pre-existing illness (cancer, or kidney failure) or an acute complication, currently untreatable with the resources of the local health system (liver necrosis, or refractory disseminated intravascular coagulation). Finally, the preventability of a death may be classed as "not established" if there are doubts concerning the health of the woman before her pregnancy (e.g. heart failure, hormone-dependent cancer) or if the information on the records is incomplete. In these situations it may be difficult to understand whether the death was preventable (22).

2. The positive aspects of the case management
3. The main causes of identified dysfunctions
4. The medical cause of death and contributing factors.

Step 4.3: Recommendations and action plan

After the summary of the case analysis, time is dedicated to finding solutions to the main problems identified: recommendations are made and an implementation plan is drawn up, to promote concrete change and ensure follow-up.

The Moderator leads the discussion in order to select the problems to be solved in order of priority, to elaborate the recommendations and to prepare an action plan and a follow-up schedule. The aim is to implement solutions and prevent the same problems from reoccurring.

1. Problems must be prioritized on the basis of the significance of their effect on prognosis, and on the feasibility of the actions necessary to solve them. For example, the problem of lack of drugs against convulsions has higher priority than the absence of third-generation cephalosporin. Similarly, the problem of the lack of labour monitoring of a parturient has higher priority than the problem of inaccurate data in administrative records.
2. For selected problems, recommendations are drafted which are:
 - Relevant to the problem
 - Specific, concrete and not simply statements of good intentions
 - Achievable or feasible in relation to the possibilities of mobilizing resources and to the expertise available at the hospital. For example, waiting for an additional gynaecologist to be posted is not a solution which the team itself has control over, whereas organising better patient reception could be.
3. Once the recommendations are drafted, a plan of action is prepared, including documentation of:
 - A deadline by which actions should be carried out
 - The name(s) of the person(s) responsible for implementing each action.
4. The head of the maternity unit and the hospital director must put in place mechanisms to ensure that the implementation of actions chosen by the team is followed up continuously. It is common for a recommendation to be fully applied in the beginning, but for adherence to gradually become more lax, and for the new way of doing things to be eventually abandoned.
5. Sometimes, the proposed recommendation is not the solution. It is an intermediate step towards solving the problem. Again, monitoring mechanisms should be used to ensure that the correct solution is identified during the session, and is then implemented.

Maternal Death Review: Grid analysis of clinical case management

Date of MDR:

MDR session N°:

In the chain of events described below, make note of the points at which dysfunctions occurred and explain why they are dysfunctions (by comparison with standards of good practice):

ITINERARY BEFORE ADMISSION

- If referred patient:
 - Conditions of transfer were appropriate: consider mode of transport (ambulance), qualified escort, first treatment (e.g.: intravenous line in place) and time required to reach hospital. Was there a referral letter? Intelligible? Useful? Clinical standards of best practice applied?
- If not referred but a complication arose before admission:
 - Decision to seek for hospital care was taken in time
 - It was possible for the patient to make the journey to hospital in adequate conditions: consider mode of transport and time to reach hospital
- In any case, consider the influence of the woman's socioeconomic status on the care received

ADMISSION

- Reception:
 - The admission was carried out appropriately: first aid provided was correct and provided at the right time in relation to the patient's condition and status (e.g. if necessary: rapid call for qualified assistance, supportive first care)

DIAGNOSIS

- If already experiencing a complication at the time of admission:
 - Staff reaction and first assessment were appropriate in relation to standards
 - Diagnosis at admission was appropriate on the basis of available information
 - Time to diagnosis was acceptable in relation to standards
 - Management at admission was correct in relation to diagnosis and standards of care
- If the complication occurred during the stay in hospital:
 - Time to diagnosis was acceptable in relation to standards
 - Management was correct in relation to patient condition and standards of care
 - Management was correct in relation to patient condition and the timing between diagnosis and treatment

- In both cases:
 - Investigations necessary for diagnosis were requested and carried out (all, none or some of them) in relation to standards
 - The time which passed before investigations were made was acceptable in relation to patient condition
 - If applicable, results from investigations were acted upon
 - Unnecessary investigations were not made

TREATMENT

- Appropriate treatment for the complication was given based on diagnosis and in relation to standards of care
- If applicable, time between diagnosis and surgery was acceptable in relation to standards
- Medical treatment was given without delay once the diagnosis was made
- Clear instructions were provided and documented on how and when the treatment should be given

PATIENT MONITORING

- Clear instructions on monitoring vital signs and other clinical features were given and documented
- If applicable, instructions given were appropriate in relation to standards of care (what to be monitored, frequency and duration)
- Monitoring of vital signs and other clinical features was documented according to instructions given or in relation to standards of care

INFORMATION IN PATIENT RECORD

- All information necessary to assess adherence to standards of care was documented in the patient's record

CAUSES OF DYSFUNCTION

For every dysfunction reported in the management of the case and/or in the procedures carried out, try to identify or clarify the causes. Consider:

1. **Staff**
(Qualification, skills, availability, attitudes, communication)
2. **Drugs**
(Availability, accessibility)
3. **Equipment**
(Availability, accessibility, functionality)
4. **Standards of good practice**
(existence, availability, transmission, use)
5. **Management, care organisation**
(coordination, communication)
6. **Patient and her family**
(Care accessibility, understanding, commitment, beliefs)

DEATH

- On the basis of this analysis, the medical cause of death is the same as was documented in the patient's record
- What are the factors/circumstances that might have adversely affected care?
- Could the death have been prevented? How?

STEP 5: DEVELOPING AN MDR SESSION REPORT

It is important to produce a written record which clearly outlines the main findings of the MDR. This will:

- Enable dissemination and facilitate the feeding-back of findings to the relevant people
- Ensure that documentation of the review is available for the next evaluation as well as for future external and internal use.

The Secretary takes notes during the discussion with the aim of producing a complete report of the session. The report contains:

1. Basic information on the MDR session (date, number, duration, place of venue)
2. The summary of the case analysis as presented by the Moderator, including:
 - The positive aspects of the case management
 - The failures in the case management
 - The main causes of identified dysfunctions
3. The recommendations and action plan.

Drafting the report is a crucial step, because it will enable an evaluation of whether recommendations have led to actions and change during the next MDR session (see Phase II, Conducting an MDR session: step 2, page 24).

A period of supervision may facilitate this step and ensure that recommendations are effectively translated into practice. As successful MDR sessions depend on attitude as well as technique, supervision by local MDR trainers/local opinion leaders is useful to ensure that all those involved act according to ground rules and that recommendations are implemented (at least during the first two MDR sessions following the launch of MDR in a hospital). Additional supervision might be needed in health facilities/hospitals which experience problems implementing recommendations.

The Secretary prepares a report for every case reviewed per session.

A tool, ***“MDR: Session Report Form”***, is proposed on pages 35-36, which can be used as a template for easily compiling a report.

In addition

The objective of the MDR is to analyse all maternal deaths, in order to gain as complete a picture as possible of causes and circumstances of intra-hospital maternal deaths.

In order to contribute to the assessment of policies to reduce maternal and neonatal mortality implemented at the national level, it is advisable to gather information on all intra-hospital deaths in the country and monitor causes and circumstances.

To provide data for this kind of national database it is recommended to fill out a form containing standard information for all cases reviewed. A template ***“MDR: Standard information form per reviewed case”*** is provided on page 37.

Maternal Death Review: Session report form

Date of MDR:

MDR session N°:

Duration of the session

Starting time: _____ Closing time: _____

Duration: _____

Case synthesis

Positive aspects of case management

Dysfunctions in case management

Main causes of identified problems

Main problems prioritized

What can be learned from this case?

**Maternal Death Review: Standard information form per reviewed case
(To be entered into database)**

Hospital name:

Type of health facility: Private clinic Health centre District hospital
 Provincial/regional/state hospital Teaching hospital

Authority running facility: Government Faith-based NGO
 Private for-profit Other:

Case Information

Patient age: Date and time of arrival:

Date and time of Death:

Death: Before delivery During delivery
 Postpartum period: N° of days after: Abortion-related

Referred: Yes No If Yes, how far (distance):

Referred from:

Residence: Rural Urban Occupation:

Marital status: Occupation of husband/partner:

Gravida: Para: Live children: Abortions

Antenatal care number of visit(s):

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

Gestation in weeks/months on presentation to health facility (if applicable):

Gestation in weeks/months at time of delivery or death if undelivered:

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

Cause of Death: _____

Contributing factors: _____

The death: Could have been prevented Could not have been prevented
 Could probably have been prevented Information not available

How it could have been prevented, and could this have happened before or after admission?

What can be learnt from this death?

STEP 6: PLANNING THE NEXT SESSION

It is important to plan the next review session. It may also be useful to plan a special session to monitor the implementation of recommendations.



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