VIRTUAL MPDSR CAPACITY-BUILDING GUIDE FOR FACILITATORS

MOMENTUM Country and Global Leadership

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MOMENTUM works alongside governments, local and international private and civil society organisations, and other stakeholders to accelerate improvements in maternal, newborn, and child health services. Building on existing evidence and experience implementing global health programmes and interventions, we help foster new ideas, partnerships, and approaches and strengthen the resiliency of health systems.

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ABBREVIATIONS

ANC	antenatal care
ARR	annual rate of reduction
CHC	community health centre
C/S	caesarean section
CVD	cephalic vaginal delivery
ELBW	extremely low birthweight
EmOC	emergency obstetric care
ENAP	Every Newborn Action Plan
HAART	highly active antiretroviral therapy
ICU	Intensive care unit
HMIS	health management information system
ILP	individual learning plan
IPT	intermittent preventive treatment
IT	information technology
LBW	low birthweight
LMICs	low- and middle-income countries
LMP	last menstrual period
MCCD	Medical Certificate of Cause of Death
MCH	maternal and child health
MDSR	Maternal Death Surveillance and Response
MPDSR	Maternal and Perinatal Death Surveillance and Response
NICU	neonatal intensive care unit
NMR	neonatal mortality rate
NVP	nevirapine prophylaxis
PDSA	plan-do-study-act
PDSR	Perinatal Death Surveillance and Response
PL	parking lot
PM	perinatal mortality
PPH	postpartum haemorrhage
PPIP	Perinatal Problem Identification Program
PPT	PowerPoint
PROM	premature rupture of the membranes
QI	quality improvement
SMART	“Specific, Measurable, Attainable, Relevant and Timely”
TBA	traditional birth attendant
TT	tetanus toxoid
USAID	U.S. Agency for International Development
VDRL	venereal disease research laboratory
VLBW	very low birthweight
WHO	World Health Organization

INTRODUCTION

The Virtual Maternal and Perinatal Death Surveillance and Response (MPDSR) capacity-building Guide for Facilitators is developed to build the knowledge and skills of the facilitators to conduct a virtual workshop when in-person training is not possible. The workshop sessions were adapted from the facilitator's guide of the in-person maternal death surveillance and response (MDSR) and perinatal death review capacity-building modules of the World Health Organization's (WHO's) Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation. The U.S. Agency for International Development (USAID) flagship Maternal and Child Survival Program supported the MDSR module, and UNICEF supported the PDSR module. Changes to the session outline to adapt the training to a virtual format include dividing some sessions into home-based assignments and interactive virtual sessions.

Countries implementing MPDSR would benefit from a facilitator's guide that combines MDSR and PDSR components; hence, this Virtual MPDSR Guide was developed. While MPDSR training can be conducted on its own, countries should consider integrating MPDSR training into existing in-service and pre-service curricula. This will improve ownership, accountability, and sustainability of MPDSR activities.

The following are some existing modules to support strengthening MPDSR capacity at subnational and facility levels:

- Maternal and Perinatal Death Surveillance and Response Capacity-Building Materials: MDSR module (in-person)[1]
- Skill Building on Perinatal Death Reviews (in-person)2
- Virtual MDSR Capacity Building Module[3]
- Virtual MPDSR Capacity Building Module[4]
- Maternal and Perinatal Death Surveillance and Response Capacity-Building Materials: MPDSR module (in-person)[5]
- Online MPDSR course[6] (available in Spanish, English, and French)

WORKSHOP GOAL

The goal of this virtual MPDSR workshop is to enhance the capacity of district and facility managers and facility providers to support strong MPDSR processes that contribute to facility and subnational efforts to improve the quality of maternal and perinatal health care and eliminate preventable maternal and perinatal deaths.

Mentorship is an integral part of this virtual workshop. Facilitators will begin mentoring the learners before the start of the workshop by supporting them in completing the home assignments and answering any questions that arise. Mentorship will continue throughout the sessions and for at least three months following the workshop via email or WhatsApp.

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[1] Maternal and Child Survival Program (MCSP)
[2] UNICEF
[3] World Health Organization (WHO) South-East Asia, MOMENTUM Country and Global Leadership
[4] WHO, MOMENTUM Country and Global Leadership, UNICEF, United Nations Population Fund (UNFPA)
[5] WHO, MOMENTUM Country and Global Leadership, UNICEF, UNFPA
[6] Pan American Health Organization, WHO, 2019

WORKSHOP OBJECTIVES

By the end of the workshop, learners will be able to:

- Identify and notify maternal and perinatal deaths
- Create and/or strengthen capacity of district/subnational and facility MPDSR committees to implement MPDSR processes
- Review maternal deaths, assign cause of death using the International Statistical Classification of Diseases-Maternal Mortality (ICD-10 MM), including COVID-19-related maternal deaths, and identify contributing factors
- Review perinatal deaths and assign cause of death using the ICD-Perinatal Mortality (PM)
- Define, implement, and monitor responses based on individual death audits
- Monitor and analyse trends in causes of maternal and perinatal deaths and findings of death reviews over time; and define, implement, and monitor a set of priority responses based on identified trends (at the facility and district/subnational levels)

WORKSHOP STRUCTURE

PRE-WORKSHOP

- Duration: Two hours and 30 minutes at least a week before the workshop
- Platform: Virtual using Zoom
- Purpose:
  - Introduce participants to the workshop format
  - Build rapport within the group ahead of the virtual MPDSR workshop and help create a positive learning environment
  - Familiarise participants with the Zoom platform
  - Acquaint participants with the session plan and home assignment for each day of the workshop

WORKSHOP

- Duration: Four days, three hours each day, with an additional 30 minutes for closing on Day 4 of the workshop.
- Platform: Virtual using Zoom
- Facilitators will serve as mentors before, during, and after the workshop using WhatsApp and email.
- Home assignments, as outlined in the Learner's Workbook, are crucial.

FACILITATOR SELECTION CRITERIA

- Qualified, competent, and experienced in maternal and newborn health service provision/management and MPDSR
- Previous training experience as a facilitator/mentor
- Respected by peers and other members of the health care team
- Demonstrated ability to communicate well, transfer knowledge and skills, and serve as a good role model
- Strongly motivated to be a facilitator and mentor
- Able to provide virtual, onsite or offsite post-training, transfer-of-learning support, and mentorship (each facilitator is responsible for three to five learners)

LEARNER SELECTION CRITERIA

- Health care providers, mainly doctors, nurses, and midwives, involved in the delivery of maternal and newborn health care
- Facility and district health managers involved in supervising health care providers who are implementing MPDSR/quality improvement (QI) activities in facilities and districts
- Total number of learners for the course should be around 15
- One Facilitator for 3-5 Participants

CHECKLIST OF MATERIALS FOR WORKSHOP ORGANISERS

- Virtual MPDSR Capacity-Building Guide for Facilitators
- PowerPoint slide decks from the WHO website (Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation and Perinatal Death Surveillance and Response) combined and adapted for this workshop
- Virtual MPDSR Capacity-Building Workbook for Learners
- Individual learning plan
- MPDSR pre-course and post-course knowledge assessment questionnaire
- Evaluation form

REFERENCE MATERIALS FOR THE VIRTUAL MPDSR CAPACITY-BUILDING WORKSHOP FOR FACILITATORS

- National MPDSR guidelines
- WHO's Maternal Death Surveillance and Response: Technical Guidance (if national guidelines are unavailable)
- WHO: Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation
- The WHO application of ICD-10 to deaths during pregnancy, childbirth and puerperium: ICD-10 MM
- Medical certification, PMmortality coding, and reporting mortality associated with COVID-19: Technical note, 7 June 2020
- The WHO application of ICD-10 to deaths during the perinatal period: ICD-10 PM

- Making Every Baby Count: Audit and review of stillbirths and neonatal deaths
- Link or video "Why Did Mrs. X Die?" https://www.youtube.com/watch?v=gS7fCvCIe1k&feature=youtu.be

AGENDA

Pre-workshop Virtual MPDSR Capacity-Building Workshop Duration: 2 hours, 30 minutes	
Welcome and introduction	
Session 1	• Overview of the workshop • MPDSR status in the region/country • Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation

Virtual MPDSR Capacity-Building Workshop Duration: 4 days (3 hours each day and an additional 30 mins for closing on Day 4)	
Day 1	
Welcome to participants	
Session 2	MPDSR Individual Learning Plan and Pre-course Knowledge Assessment
Session 3	Understanding Pathways to Maternal and Perinatal Death
Comfort break	
Session 3	Understanding Pathways to Maternal and Perinatal Death
Session 4	Six-Step Mortality Audit Cycle
Comfort break	
Session 5	Identifying Maternal and Perinatal Deaths
Wrap up	

Day 2	
Session 6	Creating or Strengthening MPDSR Committees
Session 7	Review and Knowledge Check
Comfort break	
Session 8	Key Components of Maternal and Perinatal Death Case Review Forms
Session 9	Cause Assignment Using the ICD-10 MM
Comfort break	
Session 9	Cause Assignment Using the ICD-10 MM
Wrap up	
Day 3	
Session 10	Cause Assignment Using the ICD-10 PM
Comfort break	
Session 11	Identifying Modifiable Contributing Factors for a Maternal and Perinatal Death and Priority Responses to Implement and Monitor
Comfort break	
Session 11	Identifying Modifiable Contributing Factors for a Maternal and Perinatal Death and Priority Responses to Implement and Monitor
Wrap up	
Day 4	
Session 12	Monitoring and Analysing Trends in Causes of Maternal and Perinatal Deaths and Findings of Death Reviews to Prioritise Aggregated Responses
Comfort break	
Session 12	Monitoring and Analysing Trends in Causes of Maternal and Perinatal Deaths and Findings of Death Reviews to Prioritise Aggregated Responses
Comfort break	
Closing	

GUIDANCE FOR FACILITATORS

ADVANCE PREPARATION

ONE MONTH PRIOR TO THE WORKSHOP

- Select and confirm participants
- Virtual meeting with cofacilitators and assign the sessions
- Review the materials and the presentation
- Check Internet connection

TWO WEEKS PRIOR TO THE WORKSHOP

- Prepare and send the following materials (reference materials and Virtual MPDSR Capacity-Building Workshop materials for learners) to the learners in a zip file (Annex XXVII: Checklist for Virtual MPDSR for Facilitators) along with the invitation letter (see Annex XXVIII: Draft Invitation Letter).
  - Reference materials for learners:
    - National MPDSR guidelines
    - WHO's Maternal Death Surveillance and Response: Technical Guidance
    - WHO Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation
    - The WHO application of ICD-10 to deaths during pregnancy childbirth and puerperium: ICD-10 MM
    - The WHO application of ICD-10 to deaths during the perinatal period: ICD-10 PM
    - Medical certification, ICD mortality coding, and reporting mortality associated with COVID-19: Technical note, 7 June 2020
    - Link or video: Why Did Mrs. X Die? https://www.youtube.com/watch?v=gS7fCvCIe1k&feature=youtu.be
  - Virtual MPDSR Capacity-Building Workshop materials for learners:
    - Virtual MPDSR Capacity-Building Workbook for Learners
    - Individual learning plan
    - MPDSR pre-course knowledge assessment
    - For Day 4 of the workshop
      - Virtual MPDSR post-course knowledge assessment
      - Evaluation form
- Include the following instructions in the invitation letter:
  - Complete the individual learning plan (ILP) and pre-course knowledge assessment and send it to the facilitators within one week of receiving this letter.

  - Notify the facilitators through email or WhatsApp if you have any questions about the documents or need clarification.
  - Prepare for the workshop as indicated in the Virtual MPDSR Capacity-Building Workbook for Learners **(Learners Preparation Prior to Attending the Workshop)**.
  - Note the **pre-workshop** date and time (include the Zoom link for the pre-workshop).
  - Note that the **pre-workshop** will last for two hours and 30 minutes.
  - Note that the workshop will be three hours each day over four days.
  - Send Zoom link for the pre-workshop.
  - Check Internet connection.
  - Mention that the **workshop** will last for four days and each session will be three hours with an additional 30 minutes for the closing on Day 4 of the workshop.
  - Learners will need both a smartphone and a laptop for the **Kahoot!** game on Day 2.
- Update the pre-workshop/workshop PowerPoint presentations as needed.
- Ensure you have a Zoom account that allows for extended Zoom sessions and check Internet connection.

ONE WEEK PRIOR TO THE WORKSHOP

- Form WhatsApp groups of three to five learners per facilitator. This will enable facilitators to create mentor/mentee groups with their assigned learners and provide mentorship before, during, and after the workshop. Facilitators must be available to their assigned learners when needed.
  - Include the assigned facilitator's email address and WhatsApp number in the invitation letter to learners.
- For breakout sessions, create two to three groups of learners, depending upon the number of participants, making sure each group has at least one facilitator.
- Compile the ILP and pre-course responses received from the learners and prepare a pre-course matrix (see Annexes XXII, XXIII, XXIV in this guide). Update workshop PowerPoint slides accordingly.
- Ensure each participant has been sent an assigned number along with the matrix in email and instruct participants to use their given number for the MPDSR post-course knowledge assessment. Numbers can be assigned based on the order in which the completed ILPs are received or alphabetically.
  - Individual learning plan: Learners will complete the ILP before the workshop and will send the form via email to the facilitators within the designated time frame. Facilitators will compile the individual learning plans and update the slide in the Day 1 PowerPoint presentation. During the workshop, facilitators will spend extra time on areas that learners marked as low and moderate knowledge, noting that this will help learners identify where they need to focus.
  - Pre-course knowledge assessment: Learners will complete the pre-course knowledge assessment and send it via email to the facilitators before the workshop. Facilitators will prepare the pre-course knowledge assessment matrix and update the slide in the Day 1 PowerPoint presentation. Sharing the matrix will help both learners and facilitators to focus on the areas that need the most attention.
- Review the documents needed for the training.
- Check Internet and laptop connections and confirm information technology (IT) support.
- Send the Zoom link for the workshop to participants.

TWO DAYS PRIOR TO THE WORKSHOP

- Resend Zoom link and workshop reminder.
- Review workshop materials and session plans and check sessions that need IT support.
- Check Internet connections, email, and WhatsApp messages for any issues raised by participants.
- Hold virtual meeting with cofacilitators.

ONE DAY PRIOR TO THE WORKSHOP

- Check Internet connections, email, and WhatsApp messages for any issues raised by participants regarding the workshop or Zoom link.
- Review workshop materials and session plans and check sessions that need IT support.
- Hold virtual meeting with cofacilitators.

DURING THE VIRTUAL MPDSR WORKSHOP

- Ask learners to change their participant name in the Zoom to the name they would like to be called during the workshop (see: Zoom guide: "Renaming in Zoom").
- During breakout sessions, clarify any questions and help learners to solve the assigned task.
- Encourage each learner to participate actively in the workshop.
- Remind learners at the beginning of the workshop about Zoom etiquette—microphones should be muted unless they are speaking, raise hand function, chat box for questions, etc.
- Check the chat box for parking lot (PL) questions, questions from learners regarding the current session, and time reminders to the facilitators. (Messages can also be sent privately through the chat box to the facilitator).
  - Note: In the chat box, if a question is for everyone, answer to everyone; if the question is personal, send the answer personally.
- Watch the participant list in the Zoom for the "raise hands" sign next to a participant's name.
- At the end of each day of the workshop, remind learners about the assignment for the following day.
- Serve as a mentor for participants who still score low in particular sections of the ILP after the workshop.

DAY 4 OF THE VIRTUAL MPDSR WORKSHOP

- Send the post-course knowledge assessment questionnaire and evaluation at the beginning of Day 4 via email. Instruct learners to download them and make sure they are easy to access during the session.
- Give learners 20 minutes to complete the post-course assessment. Learner scores should be 85% for successful completion of the workshop. Facilitators need to prepare a post-course knowledge assessment matrix after reviewing learners' answers and prepare a slide for sharing.
- For learners who score < 85%, facilitators will spend extra time after the workshop with them to review their understanding of the sessions and help them repeat the post-course knowledge assessment.

LEARNER PREPARATION

Inform learners that they must complete the following tasks before joining the virtual workshop each day.

Assignment to be completed and sent to facilitators prior to the workshop	
Learners to complete	**Learners to send**
Individual learning plan (ILP)	Within one week of receiving the ILP and pre-course assessment
MPDSR pre-course knowledge assessment	

Assignments for the four-day workshop		
Day 1		
Learners to review	**Learners to complete**	**Learners to watch**
National MPDSR Guidelines	Common Myths and Misconception Related to Maternal and Perinatal Death Review (Learner's Workbook, Annex II)	Why Did Mrs. X Die? at home: https://www.youtube.com/watch?v=gS7fCvCIe1k&feature=youtu.be
WHO Maternal Death Surveillance and Response Technical Guidance (if they do not have their national guide)	Exercise: Identifying maternal and perinatal deaths • Instruct learners to read their assigned scenarios in Annex IV and determine if the scenario described is a maternal death. If yes, determine whether the maternal death is due to direct or indirect causes. Ask learners to fill the answers in the Learner's Workbook, Annex IV.	
WHO: Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation	Instruct learners to read the ICD-10 PM case studies and mark 1, 2, 3, 4, 5, 6 as answers on Figure 1: Defining stillbirths and associated pregnancy outcomes (ICD-10) (Annex V)	
Virtual MPDSR Capacity-Building Workbook for Learners		
Learners to review Guiding Principles for Maternal and Perinatal Mortality Review (Learner's Workbook, Annex I).		
Transcript of Why Did Mrs. X Die? (Learner's Workbook, Annex III)		

Day 2		
1. Creating or Strengthening MPDSR Committees		
Learners to review	**Learners to complete**	**Reminders for learners**
Ask learners to read the section of their national MPDSR guidelines that defines the membership and composition of MPDSR committees. If they do not have this, they should look at Annex VI A.		
Instruct learners to see Sample Terms of Reference for Review Committee (Annex VI B) and Sample Meeting Code of Practice, (Annex VI C).		
WHO: Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation. Module 5: Conducting joint maternal and perinatal death reviews		
WHO: Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation. Module 7: Recommending actions and implementing change		
2. Review and Knowledge Check: Kahoot! Game		
Learners to review	**Learners to complete**	**Reminders for learners**
Review Zoom Guide for Learners (Annex XXII: Online Kahoot! Game)		Bring both a laptop and smartphone.
3. Maternal and Perinatal Death Case Review Forms.		
Learners to review	**Learners to complete**	**Reminders for learners**
Maternal Death Review and Clinical Summary Form for Scenario A–Abortion (Annex VII)	Based on the Maternal Death Review A–Abortion, ask learners to complete Scenario 1–PPH, Scenario 2–Uterine Rupture, Scenario 3–PE/E, and Scenario 4–Anaesthesia and write a summary in the designated box for each scenario in the Learner's Workbook, Annex VII.	
Stillbirth and Neonatal Death Case Review Form (Annex X)		

4. Cause Assignment Using the ICD-10 MM		
Learners to review	**Learners to complete**	**Reminders for learners**
ICD-10 MM Reference Aid (Annex VIII A)		
Definition of Cause Groups with Examples (Annex VIIIB)		
MCCD forms with two examples (Annex IX)		
Medical certification, ICD mortality coding, and reporting mortality associated with COVID-19, Technical note, 7 June 2020		
Day 3		
1. Cause Assignment Using the ICD-10 PM		
Learners to review	**Learners to complete**	**Reminders for the learners**
• ICD-10 PM Reference Aids 1 and 2 (Annex XI A, Annex XI B) • Maternal Condition in ICD-10 PM (Annex XI C) • ICD-10 PM Tabulation for Perinatal Cause of Death and Maternal Cause by Timing of Death (Annex XII) • Cause assignment and final ICD-10 PM group (two example case studies in Annex XIII) • Stillbirths and neonatal death review form filled up to section 4 for case study 1: Early neonatal death (Annex XIV)	Read the case studies 2,3and 4 on perinatal mortality audit and complete the Stillbirth and neonatal death review forms up to section 4 for each case study (Annex XIV).	

2. Preparing an Individual Death Review Response Plan		
Learners to review	**Learners to complete**	**Reminders for the learners**
• Maternal Death Review and Clinical Summary Forms, scenarios 1–4 • Use summaries for scenarios 1–4 to analyse the case, identify modifiable contributing factors, and prioritise responses to implement and monitor. • Review relevant response form(s) used in the country to record modifiable factors and priority responses, if available. • Understand modifiable factors that can lead to perinatal deaths. Review filled stillbirth and neonatal death case review form for case study 1 (section 5 and the section below it) (Annex XIV).	• MPDSR Individual Death Review Response Plan (Annex XVI A) • Review and analyse case studies 2, 3, and 4 to identify modifiable contributing factors and complete section 5 and the section below of the Stillbirth and Neonatal Death Case Review Forms (Annex XIV).	

Day 4		
1. Monitoring and Analysing Trends in Causes of Maternal Deaths and Findings of Death Reviews to Prioritise Aggregated Responses		
Learners to review	**Learners to complete**	**Reminders for the learners**
Review HMIS Data Availability Review Form (Annex XXI)	• Exercise A: Calculating percentage of maternal deaths by cause. Calculate the proportion of monthly maternal deaths due to specific causes (Annex XV). [Learners do NOT need to plot a bar graph as part of this exercise.]. • Exercise B: Response review and analysis. Read the description of the exercise, review Table 13, and complete Table 14: Aggregate MPDSR form: Common modifiable factors and aggregated priority responses to accelerate reduction of maternal deaths due to PPH (Learner's Workbook, Annex XVI B). • Exercise C in Annex XVII. Ask learners to read the instructions and complete Exercise C. Explain that the exercise is like Exercise A; however, instead of calculating the proportions for each cause, they will plot the data on a bar graph to visualise trends. • Exercise: Perinatal mortality rate definitions and data sources. Instruct learners to write the numerator, denominator, and data sources for the indicators given for perinatal mortality (Learner's Workbook, Annex XVIII). • Exercise on how to calculate and analyse perinatal mortality indicators (Annex XIX) • Calculate trends of perinatal mortality and tabulate antepartum cause and code the death as per ICD-10 PM (Learner's Workbook, Annex XX).	• Check email for the Virtual MPDSR Workshop post-course knowledge assessment and evaluation in the morning of the workshop. If needed, download and make it easy to access for the session. • Complete post-course knowledge assessment when asked and send to the facilitator within a designated timeframe. • Workshop evaluation: Fill and send. • Complete the online course after the workshop to reinforce their understanding: https://www.paho.org/en/news/3-3-2020-free-course-maternal-and-perinatal-death-surveillance-and-response

SESSION PLAN

Virtual MPDSR Capacity-Building Workshop **Pre-workshop Facilitator Session Plan** 2 hours, 30 minutes		
Pre-workshop		
Time	**Method/activity**	**Resource**
40 min	**Welcome and Introduction**	MPDSR Day1 PowerPoint
100 min	**Session 1: Overview of the Workshop**	
10 min	• Goals and objectives • Workshop format • Walk through workshop agenda	Virtual MPDSR Capacity-Building Workbook for Learners
40 min	• Walk through Zoom guide • Chat box • Raise hands • Whiteboard • Breakout sessions • Kahoot! game (download app)	Annex XXV: Zoom Guide for Facilitators
5 min	**Comfort break**	
10 min	• Norms • Parking lot	
10 min	• Overview of MPDSR status in the region/country	
10 min	• Review WHO Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation	
15 min	• Review of assignments • Individual learning plan and pre-course knowledge assessment • WhatsApp group • Evaluation	
10 min	**Wrap up**	

Virtual MPDSR Capacity-Building Workshop **Session Plan** Duration: 4 days (3 hours each day and 3 hours, Extra 30 minutes on Day 4)		
Day 1		
Time	**Session/activity**	**Home assignments** **(to be completed before the session)**
10 min	**Welcome**	
10 min	**Session 2: MPDSR Individual Learning Plan and Pre-Course Knowledge Assessment** • Share and discuss compiled individual learning plans and pre-course knowledge assessment matrix	Complete and return individual learning plans and MPDSR pre-course knowledge assessment to facilitators via email.
85 min	**Session 3: Understanding Pathways to Maternal and Perinatal Death**	Home assignment
5 min	• Goals and objectives of MPDSR	
5 min	• Reflection on maternal and perinatal deaths	
20 min	• Exercise: Roses and Thorns	
15 min	• Guiding principles of maternal and perinatal death review	Read Guiding Principles of Maternal and Perinatal Death Review (Learner's Workbook, Annex I).
5 min	**Comfort break**	
10 min	Myths and misconceptions related to perinatal death review	Complete Common Myths and Misconception Related to Maternal and Perinatal Death Review (Learner's Workbook, Annex II).
25 min	Why Did Mrs X Die?	Watch video and review transcript: Why Did Mrs. X Die? (Learner's Workbook, Annex III).
25 min	**Session 4: Six-Step Mortality Audit Cycle**	
5 min	• Introduction	
15 min	• Discussion: Six steps of the mortality audit cycle	
5 min	**Comfort break**	
45 min	**Session 5: Identifying Maternal and Perinatal Deaths**	
10 min	• Review session objective • Definition of maternal and perinatal death	

10 min	• Exercise: Identifying Maternal Deaths	Complete the exercise, Identifying Maternal Deaths (Learner's Workbook, Annex IV). Determine whether the death is maternal. If the death is maternal, determine whether the death is direct or indirect.
10 min	• Exercise: Type of Maternal Death (animated exercise)	
15 min	• Exercise: Perinatal Mortality Case Studies (Exercise V)	Read the ICD-10 PM case studies and mark answer 1, 2, 3, 4, 5, 6 on Figure 1 (Annex V).
5 min	**Wrap up** Remind learners to complete the assignments for Day 2	
Day 2		
Time	**Session/activity**	**Home assignments**
55 min	**Session 6: Creating or Strengthening MPDSR Committees**	
5 min	• Review the session objectives • Introduce the session	Review country-specific membership guidelines for subnational and facility-level MPDSR committees, structures of an MPDSR committee, terms of reference, and codes of conduct, if available.
15 min	• Presentation and discussion: Structure and membership of facility and district/subnational MPDSR committees	Review Learner's Workbook, Annexes VI A, B, C: • Illustrative Roles and Responsibilities of an MPDSR Committee (A) • Sample Terms of Reference for Review Committee (B) • Sample Meeting Code of Practice (C)
25 min	• Creating or strengthening MPDSR committees	Review Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation: • Module 5: Conducting joint maternal and perinatal death reviews • Module 7: Recommending actions and implementing change
10 min	• Summary	

30 min	**Session 7: Review and Knowledge Check (Formative Assessment)** • Remind learners they will need their smartphone and laptop for the Kahoot! game (Annex XXV: Zoom Guide for Facilitators)	Have a laptop and smartphone available for the Kahoot! game
5 min	**Comfort break**	
15 min	**Session 8: Key Components of Maternal and Perinatal Death Case Review Forms**	• Review maternal and perinatal death case review forms. • Review MDSR form Scenario A: Abortion (Annex VII). Review the maternal death review and case summary forms (PPH, uterine rupture, PE/E, anaesthesia). Enter summaries in the Learner's Workbook, Annex VII. • Complete stillbirth and neonatal death case review form (Annex X).
75 min	**Session 9: Cause Assignment Using the ICD-10 MM**	
5 min	Introduction	
35 min	Discussion: • ICD-10 MM classification system • Presentation: Maternal mortality coding associated with COVID-19	• Review ICD-10 MM Reference Aid (Annex VIII A), Definitions of Cause Groups with Examples (Annex VIII B), and the two example MCCD forms in Annex IX. • Review Medical certification, ICD mortality coding, and reporting mortality associated with COVID-19: Technical note, 7 June 2020 (included in reference material).
5 min	**Comfort break**	
25 min	Assigning cause of death using MCCD form	
5 min	**Wrap up**	
Day 3		
Time	**Session/activity**	**Home assignments**
65 min	**Session 10: Cause Assignment Using the ICD-10 PM**	
5 min	Review the session objectives and introduce the topic	

25 min	• Presentation: Purpose and uses of ICD-10 PM classification • Walk through the case study given in the PowerPoint to assign the cause of death • Review the home assignment Annex XIII: Assigning Cause as per ICD-10 PM case studies 1 and 2)	Review: • ICD-10 PM Reference Aid (Annex XI A, B) • Maternal Condition in ICD-10 PM (Annex XI C) • ICD-10 PM Tabulation for Perinatal Cause of Death and Maternal Condition Separated by Timing of Death (Annex XII) • Assigning Cause of Death as per ICD-10 PM (Annex XIII, case studies 1 and 2)
25 min	Group work: Assigning cause of death using stillbirth and neonatal death case review forms: Case studies on perinatal mortality audit	• Review Case Study1: Early Neonatal Death (Annex XIV) and stillbirth and neonatal death case review form filled up to section 4). • Read case studies 2, 3, and 4 and complete stillbirth and neonatal death case review forms for each up to section 4 (Annex XIV).
5 min	Summary	
5 min	**Comfort break**	
110 min	**Session 11: Identifying Modifiable Contributing Factors for a Maternal and Perinatal Death and Priority Responses to Implement and Monitor**	
5 min	Introduction	
10 min	Discussion of SMART response	
35 min	Preparing individual death response	• Review the maternal death review and clinical summary forms scenarios and case summaries (Annex VII, Scenarios 1–4). • Use the summaries to analyse the case, identify modifiable contributing factors, and prioritise responses to implement and monitor. • Complete the sample MPDSR Individual Death Review Response Plan (Annex XVI A). • Review relevant response form(s) used in the country to record modifiable factors and priority responses, if available.
5 min	**Comfort break**	

35 min	Understand modifiable factors that can lead to perinatal deaths.	• Review completed stillbirth and neonatal death case review form for case study 1 (section 5 and below). • Read and analyse case studies 2, 3, and 4 to identify modifiable contributing factors and complete section 5 and below of the Stillbirth and Neonatal Death Case Review Form (Annex XIV).
15 min	Follow up on individual death review and response plan	
5 min	**Wrap up** Remind learners to complete the assignments for Day 4	
Day 4		
Time	**Session/activity**	**Home assignments**
90 min	**Session 12: Monitoring and Analysing Trends in Causes of Maternal and Perinatal Deaths and Findings of Death Reviews to Prioritise Aggregated Responses**	
5 min	Introduction	
10 min	Calculating and analysing data trends	Exercise A: Calculating Percentage of Maternal Deaths by Cause (Annex XV)
20 min	Reviewing trends to prioritise aggregated responses (facility and district levels)	Exercise B: Response Review and Analysis (Annex XVI B)
20 min	Calculating and analysing data trends after implementing priority responses	Exercise C: Visualising Trends in Causes of Maternal Deaths (Annex XVII)
5 min	**Comfort break**	
10 min	Review exercise: Perinatal Mortality Rate Definitions and Data Sources	Exercise: Perinatal Mortality Rate Definitions and Data Sources (Annex XVIII)
10 min	Review exercise: Calculate, Analyse Perinatal Mortality Indicator	Exercise: Calculate, Analyse Perinatal Mortality Indicator (Annex XIX)
10 min	Review trends of perinatal deaths	Calculate trends of perinatal deaths. Tabulate antepartum cause and code the deaths as per ICD-10 PM (Annex XX).
90 min	**Developing an Action Plan and Wrap up**	

25 min	Post-course Knowledge Assessment	Complete post-course knowledge assessment sent at the beginning of Day 4 of the workshop.
5 min	**Comfort break**	
15 min	Review and discuss availability of maternal health data elements within country HMIS materials	Review HMIS data availability review form (Annex XXI)
5 min	Wrap up	
20 min	Action plan	
10 min	• Course evaluation to be completed and sent • Discuss how the ongoing mentoring/ WhatsApp groups will function • Discuss parking lot question	
10 min	Review post-course knowledge assessments and individual learning plans	
30 min	**Closing** **Photo session**	

SESSION OUTLINE

Virtual MPDSR Capacity-Building Workshop **Pre-workshop Session Outline** 2 hours, 30 minutes			
Time	**Method/activity**	**Resource materials**	**Instruction for virtual facilitation**
40 min	Welcome and Introduction • Welcome learners to the workshop. • Facilitator(s) introduce themselves and ask learners to briefly introduce themselves.		
Session 1: Overview of the Workshop (100 minutes) Objectives: By the end of this session, learners will be able to • Describe the workshop format • Explain how to use the Learner's Workbook • Discuss MPDSR status in region/country • Describe the WHO package, Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation			
10 min	• Review the goals and objectives of the MPDSR workshop. • Describe the MPDSR module and workshop format. • Review the Learner's Workbook. • Walk through the agenda.	MPDSR Pre-workshop PowerPoint (PPT)	
40 min	• Walk through the Zoom guide: ▪ Renaming in Zoom ▪ Chat box ▪ Raise hands ▪ Whiteboard • Breakout/work in groups: ▪ Ice breaker/getting to know each other: In groups, learners share one interesting fact about themselves • Kahoot! game (download app)	MPDSR Pre-workshop PPT	Annex XXV: Zoom Guide for Facilitators • Instruction: 2 minutes • Breakout: 7 minutes • Plenary: 6 minutes

10 min	• Workshop norms and parking lot
	  ▪ Take a few minutes to ask learners to identify workshop norms and write answers in the whiteboard.
	  ▪ Encourage active participation and collaboration; clarify that the learning environment will be an interactive, respectful, and safe environment where everyone's contributions are valued.
	• Parking lot
	  ▪ Throughout the workshop, encourage learners to write questions that require additional time or a separate discussion in the chat box and marking them PL. Explain that you will answer "parking lot" questions during the workshop if time permits or send the response via email.
	• Take questions.
			Annex XXV:
			Zoom Guide for Facilitators: Whiteboard, General Instructions for chat box

5 min	**Comfort break**		
10 min	Provide an overview of MPDSR, including MPDSR in learners' region/country.	MPDSR Pre-workshop PPT	
10 min	Review the WHO Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation.	MPDSR Pre-workshop PPT	
15 min	Review: • Assignments • Individual learning plan and pre-course knowledge assessment • WhatsApp group • Evaluation		
10 min	**Wrap up**		

Virtual MPDSR Capacity-Building Workshop **Session Outline** Duration: 4 days (3 hours each day)			
Day 1			
Time	**Method/activity**	**Resource materials**	**Instruction for virtual facilitation**
10 min	Welcome Review pre-workshop Ask if learners have any questions about the pre-workshop.	Facilitators to discuss questions regarding the pre-workshop. Play a game: Share an interesting fact that one of the participants shared in the pre-workshop and ask learners to identify the name of the participant.	Session 1: Overview of the Workshop covered in the pre-workshop
Session 2: MPDSR Individual Learning Plan and Pre-course Knowledge Assessment (10 minutes) Objective: By the end of this session, learners will be able to: • Identify areas of MPDSR where they feel competent and where they require further instruction • Discuss the pre-course MPDSR knowledge assessment			
Time	**Method/activity**	**Resource materials**	**Instruction for virtual facilitation**
10 min	Discuss the MPDSR individual learning plans and pre-course knowledge assessment. Share the individual learning plan and pre-course knowledge assessment matrices.	Virtual MPDSR Capacity-Building Facilitators Guide, Annexes XXII, XXIII, and XXIV	

Session 3: Understanding Pathways to Maternal and Perinatal Death (85 minutes)

Objectives: By the end of this session, learners will be able to:

- Describe the goals of a continual MPDSR process
- Explain the guiding principles of maternal and perinatal death review
- Identify myths/misconceptions related to maternal and perinatal death review
- Identify modifiable contributing factors that led to Mrs. X's death in Why Did Mrs X Die?

Time	Method/activity	Resource materials	Instruction for virtual facilitation
5 min	Presentation and discussion: • What is MPDSR? • Goals and objectives of MPDSR	MPDSR Day 1, Session 3 PPT Review country-specific policies/ guidelines and tailor the PPT to the country context, including adding information about other frameworks used to identify modifiable contributing factors (if the three delays model is not used). Review country-specific mortality data and update the PPT.	Annex XXV: Zoom Guide for Facilitators: How to Raise Hand
5 min	Reflections on Maternal and Perinatal Death • Ask learners to close their eyes and reflect on a time they provided health care for a woman who died while pregnant or soon after giving birth. Ask them to recall the causes and complications that led to her death. • Ask learners to reflect on a time they provided care to the newborn who died immediately after birth. Ask them to recall the causes and complications that led to the death.	MPDSR Day 1 PPT	

20 min	Exercise: Roses and Thorns This activity will encourage critical thinking about the importance of MPDSR. Based on the story each learner reflected upon: • Ask learners to identify strengths/opportunities (roses) and potential challenges (thorns). • Ask learners to write a strength/opportunity (rose) and a challenge (thorn) on the whiteboard. • Select a few strengths/opportunities (roses) and a few challenges (thorns) and share with the group. • Emphasise that every maternal and perinatal death needs to be reviewed and responses identified to prevent future deaths. *Note: Facilitators should support participants struggling with the topic or previous traumatic experiences.*	MPDSR Day 1, Session 3 PPT	Annex XXV: Zoom Guide for Facilitators: Whiteboard

15 min	Guiding Principles of Maternal and Perinatal Death Reviews
	• Introduce the topic
	• Explain that learners will work in breakout groups
	• Time limit: 8 minutes
	• Instructions for breakout rooms
	  ▪ Ask learners to go to Annex I in the Learner's Workbook (review of home assignment) and discuss the following questions in their group:
	  ◦ Is this set of guiding principles attainable in your country?
	  ◦ What actions need to be taken to ensure the set of principles become a foundation of MPDSR in your country?
	• In plenary, show the PPT slides that list the Guiding Principles of Maternal and Perinatal Death Review.
	• Ask one group to present.
	• Invite discussion by asking other groups to comment in the chat box.
			Annex XXV: Zoom Guide for Facilitators: Breakout rooms
			• Instructions: 2 minutes
			• Breakout: 8 minutes
			• Plenary: 5 minutes

5 min	**Comfort break**		

10 min	Common Myths/ Misconceptions Related to Maternal and Perinatal Death Review • Use the PPT slide deck to present selected common myths/misconceptions. • Ask learners to open Annex II in their Learner's Workbook and highlight any myth or misconception that needs further discussion.	MPDSR Day 1 PPT	
25 min	Why Did Mrs. X Die? • Introduce Why Did Mrs. X Die? as a video/transcript that illustrates the pathways to death. • Review with the learners their understanding of the Three Delays Model. Ask learners to work in groups to identify modifiable contributing factors (e.g., delays and/or barriers in the home, community, and hospital) that led to Mrs. X's death. • Bring the group back to the plenary. • Ask one group to present the modifiable contributing factors they identified. • Invite discussion by asking other groups to comment on whether the presenting group missed any modifiable contributing factors. • Make sure that the group notes all points from the Mrs. X PPT summary slides.	MDSR Day 1, Session 3 PPT and Annex III: Why Did Mrs. X Die? Transcript	Annex XXV: Zoom Guide for Facilitators: Breakout rooms • Instruction: 5 minutes • Discussion: 10 minutes • Plenary: 10 minutes
Session 4: Six-Step Mortality Audit Cycle (25 minutes) Objective: By the end of this session, learners will be able to: • Describe the six steps of the mortality audit cycle			
Time	**Method/activity**	**Resource materials**	**Instruction for virtual facilitation**
5 min	• Review the session objectives. • Ask learners what they know about the MPDSR audit cycle and show the PPT slides on the definition of audit.	MDSR Day 1, Session 4 PPT	
15 min	Introduce the six-step mortality audit cycle. Review each step while asking for examples from the group. Summarise key points from the session, noting that the audit cycle would be the same for both maternal and perinatal deaths.	MPDSR Day 1, Session 4 PPT	
5 mins	**Comfort break**		

Session 5: Identifying Maternal and Perinatal Deaths (45 minutes) Objectives: By the end of this session, learners will be able to • Describe the process of identifying maternal and perinatal deaths in their facility • Define maternal deaths and distinguish between deaths that are maternal deaths and those that are not maternal deaths • Differentiate between direct and indirect causes of maternal death • Define perinatal deaths, including stillbirths and neonatal deaths			
Time	**Method/activity**	**Resource materials**	**Instruction for virtual facilitation**
10 min	Identifying Maternal and Perinatal Death • Review the session objectives. • Introduce the session topic by asking learners to briefly describe how deaths in their facilities are identified. • Ask learners how they would define maternal and perinatal deaths. • Review definitions of maternal death, direct obstetric deaths, indirect obstetric deaths, and late maternal death.	MPDSR Day 2, Session 5 PPT	
10 min	Exercise: Identifying maternal deaths • Instruct learners to turn to Annex IV in the Learner's Workbook. • Review the answers completed at home with the group. • Ask if learners have any questions.	MPDSR Day 2, Session 5 PPT	
10 min	Exercise: Types of maternal death • Show learners animated question on types of maternal death one at a time. • Ask learners to write in the chat box the type of maternal death for each displayed question: indirect (ID), direct (D), coincidental (C), and unknown/ undetermined (U). Follow each question with a discussion.	MPDSR Day 2, Session 5 PPT	
15 min	• Review definition of perinatal death, neonatal deaths, and stillbirths. Exercise: Perinatal mortality case studies • Ask learners to open their workbook on ICD-10 PM case studies (Annex V). • Review the answers done at home by asking the learners to put their response in the chat box for the projected question. • Show the PPT with answers marked in Figure 1 (answer key).	MPDSR Day 2 PPT Annex V: Defining stillbirths and associated pregnancy outcomes (ICD-10)	
5 min	**Wrap up**		

Day 2			
Session 6: Creating or Strengthening MPDSR Committees (55 minutes) Objectives: By the end of this session, learners will be able to: • Create a facility or district/subnational MPDSR committee • Strengthen a facility or district/subnational MPDSR committee to optimise MPDSR processes • Discuss joint maternal and perinatal death review in MPDSR committee • Discuss facilitating linkages between quality improvement (QI) processes and MPDSR			
Time	**Method/activity**	**Resource materials**	**Instruction for virtual facilitation**
5 min	Introduction • Review the session objectives. • Introduce the session by asking participants to raise their hands if they are members of an MPDSR and/or a QI committee. • Ask a volunteer to tell the group which type of committee they belong to and describe the membership of that committee (e.g., facility MPDSR committee, district/subnational MPDSR committee, QI committee, combined MPDSR/QI committee) and share a brief reflection on what is working well and what they think needs strengthening. • Invite questions and reflections from other participants (on MPDSR/QI structures and membership).	MPDSR Day 2, Session 6 PPT • Update the session PPT as needed to reflect information in the national MPDSR guidelines (updates should include adding country-specific terms of reference, codes of conduct, or membership guidelines for subnational and facility-level MPDSR committees, and structures for the MPDSR committee). • Locate the section of the national MPDSR guidelines that defines the membership of MPDSR committees (district/subnationa l and facility levels).	Annex XXV: Zoom Guide for Facilitators: How to Raise Hands

15 min	Presentation and Discussion: Structure and Membership of Facility and District/Subnational MPDSR Committees • Show the PPT slides with the national MPDSR structure (adapted as needed to reflect the country guidelines). • Review learners' understanding of the following: • MPDSR committee membership and functions • Terms of reference for review committee • Meeting code of practice • Review the PPT slides on promoting a "no name, no blame" environment.	MPDSR Day 2, Session 6 PPT Learner's Workbook, Annexes VI A, B, C: • Illustrative roles and responsibilities for an MPDSR • Sample terms of reference for review committee • Sample meeting code of practice	
25 min	Exercise: Creating or strengthening MPDSR committees, including roles and responsibilities and creating a "no name, no blame" environment • Divide learners into small groups. • Ask learners to turn to Annex VI A in the Learner's Workbook and individually review the "Illustrative roles and responsibilities for an MPDSR committee." • Learners will assign members of their group to be the moderator, presenter, secretary, data manager, or member(s). Explain to learners that they will continue to play these roles in the next sessions when they practice reviewing maternal deaths. • Groups will discuss how they will ensure confidentiality and a "no name, no blame" environment in their MPDSR committees. • Return to the larger group. • Ask one group to report out on how they will try to ensure a "no name, no blame" environment.	MPDSR Day 2, Session 6 PPT	Zoom Guide Annex XXV: Breakout rooms • Instructions: 5 minutes • Group work: 15 minutes • Plenary: 5 minutes
10 min	Summary and Synthesis Show the final slide in the PPT (discussion questions). Invite participants to share reflections on what they will do to create or strengthen the MPDSR (or MPDSR/QI) committee in their area. Ask participants to "raise hands" to answer the following question: Would you suggest any changes in your local MPDSR (or MPDSR/QI) committees to ensure strengthening linkages between MPDSR and QI committees?	MPDSR Day 2 PPT	Zoom Guide for Facilitators, Annex XXV: How to Raise Hands

Session 7: Review and Knowledge Check (Formative Assessment) (30 minutes)

Objectives: By the end of this session, learners will be able to:

- Describe the goals of a continual MDSR process
- Describe and identify the six steps of the mortality audit cycle
- Distinguish between deaths that are maternal deaths and those that are not maternal deaths
- Differentiate between direct causes and indirect causes of maternal death

Time	Method/activity	Resource materials	Instruction for virtual facilitation
30 min	Check your knowledge: Learners should log in to the game and enter the answers. Refer to information for the online Kahoot! game (Annex XXV) and walk learners through playing the online Kahoot! game. Explain that questions will be projected on the screen. Each response has a colour and shape associated with it. Learners choose the shape and colour corresponding to the correct response on their screens. Use a laptop for viewing questions for the Kahoot game and use mobile to click coloured answer keys. Inform learners that points are awarded based on how quickly and accurately they answer the questions.	MPDSR Day 2, Session 7 PPT	Annex XXV: Kahoot! game Visit https://kahoot.com/ and log in using the following information: Username: MPDSR Knowledge Password: MPDSRKA
5 min	**Comfort break**		

Session 8: Key Components of Maternal and Perinatal Death Case Review Forms (15 minutes)

Objective: By the end of this session, learners will be able to:

- Identify and describe the key components of maternal and perinatal death case review forms

Time	Method/activity	Resource materials	Instruction for virtual facilitation
15 min	• Review the session objectives. • Discuss the key components of maternal and perinatal death case review forms and summary forms.	MPDSR Day 2, Session 8 PPT Annexes VII, X	

Session 9: Cause Assignment Using the ICD-10 MM (75 minutes) Objective: By the end of this session, learners will be able to: • Correctly assign the causes of maternal deaths using the ICD-10 MM classification system			
Time	**Method/activity**	**Resource materials**	**Instruction for virtual facilitation**
5 min	Introduction • Review the session objectives. • Explain that in this session, the group will learn how to use the ICD-10 MM reference aid to assign causes of maternal deaths and complete the MCCD form.	MPDSR Day 2, Session 9 PPT	
35 min	• Using the PPT, introduce learners to the purpose and uses of the ICD-10 MM classification system. • Introduce learners to the ICD-10 MM reference aid and walk learners through using the document. • Introduce the MCCD form and walk learners through its components. • Walk learners through the two example MCCD forms that they reviewed at home. • Using the PPT, introduce learners to maternal mortality coding with COVID-19.	MPDSR Day 2, Session 9 PPT Annexes VIII A, VIII B, IX	
25 min	Assigning Cause of Death Using the MCCD Form Ask learners to return to their small groups from the previous session. • In their small groups, learners will complete the MCCD form using the completed case summary of Scenario 1: PPH. • Learners will use the ICD-10 MM reference aid to help assign cause of death. They will also complete their country-specific death certificate form with the cause of death information from the MCCD form. • Once groups have completed the exercise, ask each group to explain how they assigned the cause of death for their case. • Ask for input from the other groups, including whether they agree with the cause of death assignment. If there is a misunderstanding or disagreement, review and discuss. • Refer to the PPT slides for completed MCCD forms for each scenario.	MPDSR Day 3 PPT Annex IX	Zoom Guide for Facilitators (Annex XXV): Breakout Rooms • Instruction: 2 minutes • Group work: 15 minutes • Plenary: 8 minutes

5 min	**Wrap up** • Ask learners to provide a key takeaway from the day's session and exercise. • Emphasise the importance of correct assignment of causes of maternal deaths.		
5 min	**Comfort break**		

Day 3			
Session 10: Cause Assignment Using the ICD-10 PM (65 minutes) Objective: By the end of this session, learners will be able to: • Correctly assign the causes of perinatal deaths using the ICD-10 PM classification system			
Time	**Method/activity**	**Resource materials**	**Instruction for virtual facilitation**
5 min	• Review the session objectives. • Explain that in this session, the group will learn how to use the ICD-10 PM reference aid to assign cause of perinatal deaths and complete the stillbirth and neonatal death case review form.	MPDSR Day 3, Session 10 PPT	
25 min	• Explain the purpose and uses of ICD-10 PM classification. • Walk through the case study given in the PPT to assign cause of death. • Review the home assignment Annex XIII: Assigning Cause as per ICD-10 PM (case studies 1 and 2).	MPDSR Day 3, Session 10 PPT ICD-10 PM Reference Aid (Annex XI A, B) Assigning Cause as per ICD-10 PM (Annex XIII)	
25 min	Group work • Ask learners to return to their small groups. • Learners will use the ICD-10 PM reference aid to help assign cause of death. • In their groups, learners will discuss the stillbirth and neonatal death case review form for case study 2 (antepartum stillbirth), completed up to section 4 as a home assignment (Annex XIV). • In the plenary, one of the groups will share their findings. Ask for inputs from the other groups.		Zoom Guide for Facilitators (Annex XXV): Breakout Rooms • Instructions: 2 minutes • Group work: 15 minutes • Plenary: 8 minutes
5 min	Summary • Ask learners to provide a key takeaway from the session and exercise. • Emphasise the importance of correct assignment of causes of perinatal deaths.		

5 min	**Comfort break**		
Session 11: Identifying Modifiable Contributing Factors for a Maternal and Perinatal Death and Priority Responses to Implement and Monitor (110 minutes) Objectives: By the end of this session, learners will be able to: • Identify modifiable factors that contributed to a maternal and perinatal death • Explain the Three Delays Model • Describe components of a SMART (Specific, Measurable, Attainable, Relevant and Timely) response based on identified modifiable factors • Develop response plans (at facility and district levels) for implementing and monitoring based on identified modifiable factors			
Time	**Method/activity**	**Resource materials**	**Instruction for virtual facilitation**
5 min	Introduction Review the session objectives. Explain to learners that in this session they will learn to identify modifiable factors that contributed to a maternal and perinatal death and to prioritise responses for implementation and monitoring responses.	MPDSR Day 3, Session 11 PPT	
10 min	• Using the PPT presentation, discuss the guiding principles for planning responses and components of SMART responses. • Ask learners to type in the chat box what SMART stands for. • Review the Three Delays Model. • Discuss the individual death review response plan development process. • Introduce and review relevant response form(s) used in the country to record modifiable factors and priority responses, if available.	MPDSR Day 3, Session 11 PPT Specific country MPDSR response plan	

35 min	Exercise: Preparing an individual death review response plan • Ask learners to return to the small groups. • In small groups, learners will use the case summary they worked on as a home assignment for Scenario 1: PPH to identify modifiable contributing factors and prioritise responses to implement and monitor. • Work with learners to complete the sample MPDSR individual death review response plan (Annex XVI A). • Ask one group to volunteer to report out, and invite feedback from the other groups. • Lead a discussion on formulation and implementation of an individual death review response plan.	MPDSR Day 3 PPT Annex XVI A	Zoom Guide for Facilitators Annex XXV) Breakout Rooms • Instructions: 5 minutes • Group work: 15 minutes • Plenary: 10 minutes • Review: 5 minutes
5 min	**Comfort break**		
35 min	• Understand modifiable factors that can lead to perinatal deaths using case studies on perinatal mortality audit (Annex XIV) • Ask learners to return to their groups. • In groups, learners will review and analyse case study 2 (section 5 and below) given as a home assignment (Learner's Workbook, Annex XIV). • In the plenary, ask one group to share their answers to the following questions and other groups to add: • What modifiable factors may have contributed to the death? • What missed opportunities for good care or instances of substandard care can you identify? • What changes to the action plan would you recommend to improve quality of care?	Annex XIV	Zoom Guide for Facilitators Annex XXV: Breakout Rooms • Instructions: 5 minutes • Group work: 15 minutes • Plenary: 10 minutes • Review: 5 minutes
15 min	Follow up on Individual Death Review Response Plans • Using the PPT, discuss the importance of regular review and follow-up of individual death review response plans. • Review examples of strategies that MPDSR committees can implement to follow up on responses from death reviews. • Ask learners to discuss which strategies they would adopt and take back to their committees. • Ask one volunteer to report out, and invite feedback from the other groups.	MPDSR Day 3 Session 11 PPT	

5 min	**Wrap up** • Ask learners to discuss key components of an MDSR/PDSR response plan. • Remind learners of the importance of formulation and follow-up of response plans.		

Day 4			
Session 12: Monitoring and Analysing Trends in Causes of Maternal and Perinatal Deaths and Findings of Death Reviews to Prioritise Aggregated Responses (90 minutes) Objectives: By the end of this session, learners will be able to: • Practice monitoring and analysing trends in causes of facility maternal and perinatal death and findings of death reviews for leading local causes of death • Practice prioritising aggregated responses at the facility and district/subnational level based on analysis of local trends in causes of maternal death and findings of death reviews • Review availability of maternal and perinatal death data elements in country health management information system (HMIS) materials (facility and subnational) and discuss ways to strengthen availability of maternal health and death data in HMISs • Discuss facilitating linkages between QI processes and MPDSR			
Time	**Method/activity**	**Resource materials**	**Instruction for virtual facilitation**
5 min	Review session objectives. • Tell learners that this session is about analysing trends in causes of maternal deaths and findings of death reviews to understand local leading causes of death and key contributors to these deaths, and prioritising aggregated responses based on trends. • Discuss the importance of data visualisation. • Explain how to calculate and analyse the perinatal mortality indicator.	MPDSR Day 4, Session 12 PPT Modify the HMIS section of the session PPT slides based on data elements available in the HMIS forms.	
10 min	Calculating and Analysing Data Trends (Exercise A: Calculating percentage of maternal deaths by cause) • Review the PPT slides on monitoring and interpreting trends in maternal deaths by cause. • Explain how to calculate the proportion of maternal deaths by individual cause, using the example in the PPT slide. • Ask learners to write their responses to Exercise A in the chat box.	MPDSR Day 4, Session 12 PPT Annex XV	

20 min	Review of Trends to Prioritise Aggregated Responses (Facility and District Levels) (Exercise B: Response review and analysis)
	• Divide learners into groups and ask them to discuss:
	  ▪ What patterns do you see if any in the modifiable factors identified in the last eight audits of death? (Learner's Workbook, Annex XVI B, Table 13)
	  ▪ What are the most important and common modifiable factors that your team should prioritise?
	  ▪ Based on these modifiable factors, how will your committee prioritise aggregate response?
	• Groups should then discuss the first three bullets of Exercise B, Table 13 and complete Annex XVI B, Table 14, of the workbook.
	• Ask groups to consider, in their setting, is it possible to review previous audit findings to identify common modifiable factors and responses?
	• As part of this discussion, ask learners whether they would have been able to create Table 13 based on forms used in their facilities or at the district/regional level.
		MPDSR Day 4, Session 12 PPT
		Annex XVI B
			Zoom Guide for Facilitators
			Annex XXIII: Breakout Rooms
			• Instructions: 5 minutes
			• Group work: 10 minutes
			• Plenary: 5 minutes

20 min	Calculating and Analysing Data Trends after Implementing Priority Responses (Exercise C: Visualising trends in causes of maternal deaths) • Review the PPT slide on the importance of data visualisation and show visualising trends on a bar chart and visualising and interpreting trends in proportion of deaths by cause (Exercise A). • Ask a volunteer to present the graph and invite discussion/comments from other learners. • Show the completed graph in the PPT and discuss the trends.	MPDSR Day 4, Session 12 PPT Annex XVII	
5 min	**Comfort break**		
10 min	Perinatal Mortality Rate Definitions and Data Sources • Review home assignment: Perinatal Mortality Rate Definitions and Data Sources (Annex XVIII). • Go over the types of perinatal death one at a time. • Ask learners to write their answers (numerator and denominator) for each question in the chat box and to determine the perinatal mortality rate for each. • Review using answer keys.	MPDSR Day 4, Session 12 PPT	

10 min	Calculate, Analyse Perinatal Mortality Indicator • Use the PPT to guide a discussion about how to calculate different indicators. • Display indicators for calculation one at a time. Ask learners to write their responses to the exercise in the chat box. • Review answers using the PPT.	MPDSR Day 4, Session 12 PPT Annex XIX	
10 min	Review of Trends of Perinatal Deaths • Share the six months trends of perinatal death in a health centre. • Use the whiteboard to review the home assignment on calculating stillbirth rate, antepartum and intrapartum stillbirth percentage. • Mention to the learners that in the six months trends, the stillbirth rate is 56.5% and antepartum stillbirth is 85.7%, which is more than intrapartum. In the committee, causes of antepartum stillbirths were analysed, Of the six, three were due to infection, two due to hypoxia, and one due to congenital malformation. Review the tabulated findings of antepartum cause of death as per ICD-10 PM and formulate a response plan.	MPDSR Day 4, Session12 PPT Annex XX	Zoom Guide for Facilitators Annex XXV: Whiteboard
Developing an Action Plan and Wrap up (90 minutes)			
Time	**Method/activity**	**Resource materials**	**Instruction for virtual facilitation**
25 min	Post-Course Knowledge Assessment • Send the post-course questionnaire before the start of the Day 4 sessions to learners via email. • During this session, ask learners to complete the post-course questionnaire that was sent to their email and return it via mail. • Instruct participants to enter the number they were assigned after pre-course in the designated box of the post-course knowledge assessment sheet. Note that their score should be 85% for completion of the workshop. • One of the facilitators will review the answers and prepare a matrix to be shared later.		
5 mins	**Comfort break**		

15 min	Review and Discussion of Availability of Maternal and Perinatal Health Data Elements within Country HMIS Materials • Show the PPT slides with examples of data elements available in the country's HMIS monthly summary form, facility register (clinic/hospital), and individual patient record (clinic/hospital). (Use standard forms if they exist or an illustrative example from a facility if there are no standard forms in the country/region.) • Ask learners if they would have been able to complete Exercises A and C using available country-specific HMIS materials (in their work setting). • Ask learners to write two to three changes they could make to their HMIS forms to improve the availability of the data elements used in Exercises A and B (e.g., monthly reporting form, facility register, patient records). Ask for two or three volunteers to share their suggestions.	Modify the HMIS section of the session PPT based on data elements that are available on the HMIS forms (Annex XXI).	
5 min	Wrap up • Highlight the importance of analysing monthly data on maternal deaths, causes of death, and MPDSR findings (using all available data sources) to understand patterns and prioritise aggregated responses most likely to reduce the leading local causes of preventable maternal deaths.		
20 min	• Develop action plan • Share white board through Zoom link. Click "Annotate" and use "Text" to write the names of the countries/names of health facility they represent. • Ask participants to use the white board by clicking "Annotate" and using "Text" to write the action plan of their respective countries or health facility.		
10 min	• Course evaluation to be completed and sent. • Discuss how the ongoing mentoring/WhatsApp groups will function. • Discuss parking lot questions.		
10 min	• Discuss individual learning plan, post-course matrix, and the knowledge assessment questions. • Ask learners if there are any topics they would like to review and discuss (parking lot questions).		
Workshop Closing (30 minutes)			
	• Closing remarks • Photo session		

ANNEX I: GUIDING PRINCIPLES FOR MATERNAL/PERINATAL MORTALITY REVIEWS

- Adhere to a no blame policy. Health care providers are vulnerable to blame during mortality reviews and a blame culture may discourage honest reporting of events.
- No blame is NOT no accountability.
- Death reviews should focus on health systems and not on individuals.
- Data are anonymised and cannot be used for disciplinary purposes.
- Review meetings are a learning opportunity for all participants to improve quality of care and prevent deaths.
- Confidentiality and a culture of learning and improvement are essential for a well-functioning MPDSR system.
- Build on existing quality improvement (QI) committees and existing MPDSR work.
- Maternal and perinatal mortality reviews can be integrated.
- Response often involves a multisectoral approach.
- MPDSR should be incorporated into the curricula of medical, nursing, and midwifery programmes.
- Review teams should adopt a zero-reporting principle, which is an active process of notifying that no maternal deaths occurred. A “zero” is captured in the data collection system rather than nothing at all.
- Detailed patient histories are important since documentation of patient care is the main source of information for audits.

ANNEX II: COMMON MYTHS/MISCONCEPTIONS RELATED TO MATERNAL AND PERINATAL DEATH REVIEW

MYTHS

Myth 1: Pregnancy and childbirth are no longer dangerous.

Answer: Deaths related to pregnancy and childbirth are still an unfinished agenda.

- Almost 6 million deaths related to pregnancy and birth occurred in 2015.
- 303,000 mothers died during pregnancy and childbirth in 2015.
- 2.6 million stillbirths – 50% of whom were alive at the start of labour
- 2.7 million newborn deaths, of which 1 million deaths occur on the day of birth
- The majority of these deaths are preventable through simple evidence-based interventions.

Myth 2: There are no global targets focused on the reduction of stillbirths and neonatal deaths.

Answer: There are global targets for neonatal mortality reduction set in the Every Newborn Action Plan (ENAP). Targets are that there must be:

- 12 or fewer neonatal deaths per 1,000 live births in every country by 2030.
- A global annual rate of reduction (ARR) of 4.3% needed to achieve the global NMR target, but this varies between countries, with 29 countries needing to at least double their ARR.
- Progress is tracked and reported in the ENAP progress tracking report on an annual basis and presented at the World Health Assembly annually.
- In 2018, 75 countries tracked progress on NMR and reported it in the ENAP report.

Similarly, there are targets for stillbirths (included in ENAP):

- 12 or fewer stillbirths per 1,000 total births in all countries.
- All countries to set and meet equity targets within countries by 2030.

MISCONCEPTIONS

Misconception 1: Perinatal death reviews are impossible in my setting as there are too many neonatal deaths and stillbirths.

Answer: There are ways to select a sample of neonatal deaths and stillbirths. Every single death that is reviewed can tell us a story about what could have been done differently to unlock solutions that should have been available for each woman and baby. A meta-analysis of before and after effects associated with the introduction of perinatal audits in low- and middle-income countries (LMICs) demonstrated a 30% (95% CI, 21%–38%) reduction in mortality. However, there are other studies that have not shown any impact. This suggests that the review process will only be as helpful as end users make it out to be.

Misconception 2: Maternal and perinatal death reviews can expose the providers to punitive or disciplinary action (discussed in PowerPoint presentation).

Answer: The perinatal death review process should be anonymised, and the committee should talk about case X and not discuss specific identifiers for any individual case. Committee members should not discuss individual cases outside the review meeting. Gossip may lead to judgement and fear of punishment, and impedes objective, honest, and successful conduct of the review. Healthy hospitals should help staff understand that errors are unintentional and that learning from any adverse event is useful.

Misconception 3: Quality improvement PDSA cycles and maternal/perinatal death reviews are not linked (discussed in PowerPoint presentation).

Answer: Once cases for perinatal death review are identified and reviewed, we will be able to identify modifiable factors and failures in care processes. This leads to development of action plans, which generally take two forms: provider level actions and/or a QI project to address systematic issues.

Hence, perinatal death review findings help facility teams to formulate realistic problem statements for conducting a quality improvement/PDSA cycle. Testing of these solutions will help in effective implementation of change ideas.

ANNEX III: WHY DID MRS. X DIE? TRANSCRIPT

This is the story of a mother called Mrs. X. Mrs. X could have come from anywhere, but she is most likely to have come from a low-income family in a poor country. Mrs. X represents a universal mother.

Mrs. X died in the small hospital when she was eight months pregnant. The doctor had no doubt about the cause of her death: a haemorrhage. Her placenta had been too low in her uterus and it hadn't been identified in time. The doctor recorded her death, closed her file, and added it to a growing stack of similar cases locked away in a cupboard. Over time, the stack grew and grew.

Some years later, worried about the high number of mothers dying in their hospital, the staff reviewed the cases to learn lessons and make improvements. They reopened and reviewed file after file. One of these was that of Mrs. X. When they read it, they found two striking points. First, Mrs. X had arrived at the hospital bleeding heavily, yet she only received half a litre of blood. This was all the hospital had available, and it was not enough. Second, Mrs. X and her baby needed a caesarean section, but resources were limited, and the operation took place three hours too late. Both Mrs. X and her unborn baby died.

The group then visited Mrs. X's village and spoke with her family, neighbours, and community leaders. They found that there were other reasons for her death. Mrs. X had a history of bleeding early in pregnancy but wasn't aware that this was a danger sign needing attention. She also had had only one antenatal visit. If she'd gone regularly, the problem may have been caught. She would have been referred to a specialist, and she and her baby could have survived. Mrs. X was also severely anaemic, so the loss of even a small amount of blood, as little as a cupful, could have tipped the balance between life and death. The team discovered that it had taken six hours to collect enough money to pay for her transport to the hospital.

As a result of these findings, the hospital improved their blood supplies, updated their emergency procedures, and caesarean sections could now be performed as soon as it was necessary. The local health department provided more midwives in more places to enable more women to have access to good maternity services throughout pregnancy and birth. Mrs. X's file was closed again.

A year later, a group of visiting health professionals came to the hospital as part of a national inquiry into maternal deaths. They wanted to understand what lay behind the statistics, beyond the numbers, and to discover the wider social and economic reasons for the deaths of women like Mrs. X and their babies and what could be done about it. The aim of their work was to recommend changes to national or regional policies and strategies, improve women's health, and save mothers' lives. When they reviewed all the data, common patterns emerged. They found most mothers' stories were similar to that of Mrs. X.

Like many women in developing countries, Mrs. X worked day and night to care and provide for her family. She was illiterate. She lived in poverty in a remote village. She was unable to choose when and if to become pregnant. Mrs. X was also weak and unhealthy. In her society, the male members of the family came first in the queue for food, for education, and for health care. Mrs. X often went without. For women like her, death or complications in pregnancy were, and still are, a real threat.

By uncovering the stories of women such as Mrs. X, the national team was able to put pressure on the government to provide more education for girls, more resources and staff for maternity care, and better reproductive health services. They also pushed for raising community awareness about health, nutrition, family planning, and the benefits of skilled maternity care.

Mrs. X started on the pathway of her pregnancy exhausted, with few physical reserves. She hadn't chosen to become pregnant. It was her destiny. The only value she had to her family and community was her ability to produce children. However, Mrs. X had been lucky, in a way. At least she'd had a childhood. In some societies, girls are married off while still children themselves, not physically or mentally prepared for childbirth or motherhood.

If Mrs. X had been treated as an equal to her brothers while she was growing up, she could have been healthier and better educated. If she'd had more control over her adult life, she may have been able to choose when to have children. As Mrs. X continued her walk through pregnancy, her prospects would have been better if she visited a skilled professional health worker, a midwife, or doctor. Even if Mrs. X had known the importance of antenatal care, her midwife was many miles walk away. If only Mrs. X's problems had been recognised and her anaemia treated. If only she'd had specialist care in time.

Because of tradition, poverty, and lack of knowledge, many women in Mrs. X's community gave birth at home. Some told stories of being treated harshly and disrespectfully by hospital staff. Some were expected to pay bribes. Mrs. X had also planned to give birth at home, but then she developed a life-threatening complication. She started to bleed.

If Mrs. X had been referred and had timely transport to a hospital with facilities for providing comprehensive emergency obstetric care, such as equipment, well-trained staff, and enough medicines and blood, her life and that of her baby might have been saved.

Mrs. X could have lived to raise her children.

After the long delay in finding transport, Mrs. X was eventually admitted to the hospital where, due to the lack of resources, she and her baby died.

Along the pathway of her pregnancy, Mrs. X faced barriers that prevented her from receiving the care she needed. Each could have been removed. And yet, many or all of these barriers remain along the roads taken by women today.

Mrs. X could be any woman. Your sister, your wife, your mother, your daughter, you. It is up to all of us, no matter where we live, who we are, or what we do, to help remove these barriers for Mrs. X and the millions of pregnant women like her. As individuals, we can lobby for better health care and equal rights for girls and women. As communities, we can make sure our pregnant women are informed and cared for. We can organise local education, support, and transport for our mothers. As health care workers, we can provide quality care in a respectful environment. And we can continue to open the files and learn the lessons from mothers like Mrs. X.

As local health planners, we can provide high-quality maternity and family planning services that reach out to more women. And as politicians and policymakers, we can strengthen human rights. We can improve education for girls and women. And we can provide the resources for better, more effective health care services across the world, wherever they're needed, now.

ANNEX IV: IDENTIFYING MATERNAL DEATHS WITH ANSWER KEY

Read each of the following scenarios and determine whether the scenario described is a maternal death. If it is a maternal death, determine whether the maternal death is due to direct or indirect causes.

Answers are given below each scenario.

Scenario 1
A 21-year-old woman went into labour and delivered a healthy baby at home normally. One hour later, she was bleeding heavily. She was rushed to the health facility but died two hours after arrival.

Answer: Maternal death, direct – postpartum haemorrhage

Scenario 2
A 30-year-old woman in the seventh month of her pregnancy was on her way to the clinic when the vehicle she was travelling in overturned. She was severely injured and taken to the hospital but died a few hours later.

Answer: Non-maternal death, coincidental – car accident

Scenario 3
A 19-year-old woman was rushed to the outpatient department of a small hospital with a severe headache. Her husband said she was eight months pregnant but received regular antenatal care (ANC) at her local primary health care centre. It was her first pregnancy. She had severe seizures just prior to arriving at the hospital. She was admitted and died immediately.

Answer: Maternal death, direct – pre-eclampsia/eclampsia

Scenario 4
A woman in her fourth month of pregnancy was having fevers at night, with sweats and a cough. She had not attended any ANC visits. She was HIV-positive. She was rushed to the hospital with shortness of breath and difficulty breathing. She was found to have pneumonia and started on treatment, but died a few hours later.

Answer: Maternal death, indirect – pneumonia

Scenario 5
A 21-year-old woman missed her periods and went for a pregnancy test. When she found out she was pregnant, she went to a local clinic and bought some medicine to try to end the pregnancy. She started bleeding heavily and died a few hours after arriving at the hospital.

Answer: Maternal death, direct – abortion

Scenario 6
A 35-year-old woman arrived at the health facility exhausted and pale. Her husband said she had been in labour for the past 12 hours at home. Since all her previous deliveries were at home and without problems, they kept her at home. On examination, the midwife found that the infant's head was still high, but the cervix was fully dilated. They immediately prepared her for an emergency caesarean section; however, the woman died before the caesarean section could be performed.

Answer: Maternal death, direct, other obstetric complication – obstructed labour

Scenario 7
A 29-year-old woman who was 30 weeks pregnant had fever, vomiting, and joint pain. She started having a high fever and was taken to the hospital and put on antimalaria medication for 24 hours. However, her condition deteriorated overnight, and she died.

Answer: Maternal death, indirect – malaria

Scenario 8
A 35-year-old woman was in her third pregnancy and had not had any problems. She went into labour and her husband kept her at home because her two previous babies had been born at home. She was attended by a local traditional birth attendant who performed repeated vaginal examinations to check her progress. After 24 hours, the woman had not delivered, so the husband took her to the hospital. The baby was breech. Assisted breech delivery was required. She did not receive antibiotics after the assisted delivery but was kept in the hospital for observation for eight hours before being discharged and sent home. She returned to the maternity ward complaining of excessive foul-smelling discharge and high fever. She died a day later.

Answer: Maternal death, direct – puerperal sepsis

Scenario 9
An asymptomatic woman who has a positive COVID-19 test dies of hypovolemic shock following massive postpartum hemorrhage and uterine atony

Answer: Maternal death, direct – postpartum hemorrhage

ANNEX V: ICD-10 PM CASE STUDIES WITH ANSWERS

Case Study 1
A 23-year-old primigravida woman, single, with no risk factors during pregnancy, referred from lower-level health facility, history of amenorrhoea for the past three months, went to a traditional health worker wishing to terminate pregnancy. Given some herbal medicines. Presents to the hospital with a history of bleeding with fleshy mass discharge. On admission complains of abdominal pain and mild fever. No foetal heart sound on auscultation. Ultrasonography reveals echogenic content suggesting product of conception, with free fluid in uterus and pelvic cavity. Diagnosis of incomplete septic abortion. What is the outcome of pregnancy?

Answer: Miscarriage

Case Study 2
A 21-year-old woman, gravida 5, para 2+2, haemoglobin 11 gm/dl, venereal disease research laboratory (VDRL) ++, eight months since her last menstrual period, complains of decreased foetal movement for two days. No foetal heart rate on admission, labour induction started, delivered a stillborn baby weighing 1,100 grams with signs of maceration of the skin. What is the outcome of pregnancy?

Answer: Antepartum stillbirth

Case Study 3
A 28-year-old woman, primigravida, short stature, uneventful pregnancy history, labour diagnosed to be prolonged (foetus has failed to engage after two hours of complete dilation). Emergency caesarean section undertaken. Apgar score of 4 at one minute and 7 at five minutes. Baby placed under oxygen therapy, weak suckling reflex and cannot breastfeed properly, started on cup feeding, shows progressive improvement and discharged from hospital after two weeks. Baby dies at home on day 21. What is the outcome of pregnancy?

Answer: Neonatal death

Case Study 4
A 35-year-old pregnant woman with diagnosis of gestational diabetes with a gestational age of 42+ weeks of pregnancy complains of decreasing foetal movements. Foetal heart rate was found to be 190 per minute on auscultation. A decision to perform an emergency caesarean section was made. Baby showed no signs of life at birth and was covered with meconium. What is the outcome of pregnancy?

Answer: Intrapartum stillbirth

Case Study 5
A 35-year-old woman, known to be at full term, with a history of four stillbirths and two live births, delivers a live baby weighing 3.4 kg at the hospital. The baby takes a breath at birth but is floppy and makes no further attempt at breathing. Vigorous stimulation and resuscitation with bag and mask are unsuccessful. What is the outcome of pregnancy?

Answer: Early neonatal death

Case Study 6
A 31-year-old woman, primigravida at 39.7 weeks gestation, comes to the emergency room. History of uneventful pregnancy except recent complaints of decreased foetal movements. Blood group is B Rh-positive, and she is positive for group B streptococcus. Contractions started when she was in the emergency room, but no foetal movements were perceived. An external foetal monitor and ultrasound examination confirmed intrauterine foetal death. There was no evidence of physical abuse, nor was there evidence of abruption, either clinically or pathologically.

Answer: Antepartum stillbirth

ANNEX V: DEFINING STILLBIRTHS AND ASSOCIATED PREGNANCY OUTCOMES (ICD-10)

Source: adapted from Lawn et al., 2011 *(23)*.

Figure 1: Please insert answers as 1, 2, 3, 4, 5, 6 in the figure for the respective questions.

ANNEX VI A: ILLUSTRATIVE ROLES AND RESPONSIBILITIES OF AN MPDSR COMMITTEE

TABLE 1. ILLUSTRATIVE ROLES AND RESPONSIBILITIES[7]

Role	Responsibilities	Skills	Reports to/ consults with
Moderator/ chair	• Convene the MPDSR committee at regular intervals • Facilitate discussion and encourage respectful and open communication • Establish ground rules and remind participants of the code of conduct, including confidentiality and no blame principle • Lead review of previous meeting's recommendations and status updates	Facilitation, listening, impartiality	District manager, Ministry of Health
Presenter	**Before the review meeting:** • Identify maternal deaths • Gather all information relevant to the cases to be reviewed • Conduct the interviews with staff involved with the case **During the review meeting:** • Present summary of clinical cases under review at committee meetings • Complete MPDSR form and medical certificate of the cause of death • Follow committee code of conduct and ensure **no blame environment**	Tact, sensitivity, attention to detail	Secretary
Secretary	• Work with the chair to prepare the meeting agenda • In consultation with the presenter, ensure relevant documents are available for the review meeting • Summarise the case analysis • Send completed form to appropriate person/ focal point • Develop and share report of the review meeting • Follow committee code of conduct and ensure **no blame environment**	Writing, coordination of tasks	Moderator/ chair, presenter

[7] Adapted from: De Brouwere V, Zinnen V, Delvaux T (2013) How to conduct Maternal Death Reviews (MDR). Guidelines and tools for health professionals. London, International Federation of Gynaecologists and Obstetricians, FIGO LOGIC, http://www.figo.org/files/figo-corp/MDR_Guidelines_2013.pdf accessed January 2018

Role	Responsibilities	Skills	Reports to/ consults with
Data manager	• Periodically review data trends • Monitor data input quality • Input data into database • Send data to receiving parties (Ministry of Health, etc.) • Develop dashboard and data visualisation • Follow committee code of conduct and ensure **no blame environment**	Monitoring and evaluation, data management	Moderator/ chair, presenter, secretary
Members	• Participate in review of maternal deaths in the facility • Recommend and participate in implementation and follow-up of individual and aggregated death review responses • Ensure confidentiality of meeting proceedings • Follow committee code of conduct and ensure **no blame environment**		
Quality improvement (QI) team representative	• Participate in review of maternal deaths in the facility • Recommend and participate in implementation and follow-up of individual and aggregated death review responses • Transmit QI interventions developed by the MPDSR committee to the QI team • Coordinate and report on status of QI team's interventions to the MPDSR committee • Ensure confidentiality of meeting proceedings • Follow committee code of conduct and ensure **no blame environment**		

ANNEX VI B: SAMPLE TERMS OF REFERENCE FOR REVIEW COMMITTEE

PURPOSE

Reducing maternal and perinatal deaths is a priority for this health facility, in accordance with local, national, and global goals. Recognising that the primary aim of MPDSR is action that results in improved quality of care, the purpose of the MPDSR review committee is to coordinate an effective review of maternal deaths, stillbirths, and neonatal deaths, and to oversee implementation of the recommendations arising from these reviews.

AUTHORITY

The committee may decide or advise on appropriate corrective and other actions, which may be required to reduce mortality and improve quality of care.

MEMBERSHIP

Describe the core, ad hoc, and other members of the MPDSR review committee. Stress the importance of multidisciplinary membership.

DUTIES AND RESPONSIBILITIES

Coordinate meetings at a specified frequency. Ensure that all relevant health information and data are made available for such meetings:

- Monitor trends in births and deaths and other relevant data.
- Ensure that actions arising from recommendations are implemented and communicated.
- Work collaboratively with other quality improvement mechanisms and other key partners within the facility.
- Promote a no blame environment for mortality review.
- Consider the relevance of MPDSR activities to other levels of the health system and share findings as mandated.
- Ensure attendance of key stakeholders.
- Ensure confidentiality.
- Coordinate the creation and dissemination of summary reports as required.

PROCEDURAL ISSUES

Describe decisions made in regards to:

- Frequency of meetings
- Meeting roles (e.g., chairperson, secretary)
- Quorum
- Adherence to a meeting code of conduct
- Completion and distribution of meeting minutes (maximum three working days)

REVIEW

The terms of reference and committee processes will be reviewed every year, or sooner should the need arise.

ANNEX VI C: SAMPLE MEETING CODE OF PRACTICE

CODE OF PRACTICE

To show respect for the women, babies, and families we are responsible for looking after, we, the staff of _____ [name of facility], agree to respect the rules of good conduct during meetings where cases of deaths that have occurred in our facility are reviewed.

We understand and appreciate that the results of these meetings will not result in punitive measures. The rules of our stillbirth and neonatal mortality audit meetings include:

- Arrive on time to the audit meetings.
- Participate actively in discussions.
- Respect everyone's ideas and ways of expressing them.
- Accept discussion and disagreement without resorting to verbal abuse.
- Respect the confidentiality of the discussions that take place during the meetings.
- Agree not to hide useful information or falsify information that could provide insight into the case(s) under review.
- Try as much as possible (recognising that it is not easy) to accept that your own actions can be questioned.

Signed: _____ Date: _____

Signed: _____ Date: _____

Signed: _____ Date: _____

Signed: _____ Date: _____

Signed: _____ Date: _____

Signed: _____ Date: _____

ANNEX VII: INTRODUCTION TO MATERNAL DEATH REVIEW AND CLINICAL SUMMARY FORMS[8]

SCENARIO A: ABORTION

TABLE 2. CLINICAL SUMMARY FORM: ABORTION

Date of MDR: 10 December 2017 **MDR session N°:** 000/example

Patient code: Patient001

Patient age: 23 years

Marital status: ☐ Married/cohabitant ☐ Divorced ☒ Single

Gravida: 1 **Para:** 0 **Live children:** 0

Number of previous caesarean sections: 0 **Date of last C/S:** N/A

Prior obstetric complications: None

Pre-existing medical problems: None

Number of antenatal care visits in this pregnancy: 0

Risk factor(s)/complications detected during this pregnancy/labour: None

If delivered/aborted before admission: None

Date: **Duration of amenorrhoea:** **Live baby:** ☐ Yes ☐ No

Place of birth/abortion: **Assisted by:**

Complications occurred: ☐ Yes ☐ No

If pregnant on admission:

Duration of amenorrhoea: 3 months

[8] Adapted from: De Brouwere V, Zinnen V, Delvaux T (2013) How to conduct Maternal Death Reviews (MDR). Guidelines and tools for health professionals. London, International Federation of Gynecologists and Obstetricians, FIGO LOGIC, https://www.figo.org/sites/default/files/uploads/projecpublications/LOGIC/VfinalEdited%20MDR%20Guidelines%20final%202014.pdf

Referred from another institution: ☒ Yes ☐ No

Type of institution? Health centre

Reason for coming to hospital: Severe lower abdominal pain, bleeding with passage of fleshy mass from the vagina

History of the referral/process of reaching the institution: The patient was unmarried and had wanted to terminate the pregnancy. A woman in the village gave her some herbs to insert into her vagina. After some days, she began bleeding and passed several small pieces of fleshy tissue from her vagina. She developed abdominal pain and a foul-smelling discharge and was rushed to the health centre, which referred her to the hospital.

What associated factors may have contributed to this death (e.g., woman's status in community)? She was a young woman unable to access safe abortion services.

Date and time of admission: 01 December 2017, 7:00 pm

Main reason for admission: Incomplete abortion (induced abortion)

Initial clinical assessment/ultrasound/laboratory findings at admission: General condition was poor. Ultrasound revealed echogenic content suggestive of product of conception, with free fluid in the uterus and pelvic cavity.

Diagnosis made at admission: Incomplete abortion

Summary of the case evolution if complication(s) occurred after admission: After failure of expulsion of the products of conception, she developed foul discharge and was rushed to the hospital where her condition worsened.

Sequence of events if abortion/delivery occurred: See summary above

Complications: Sepsis

Clinical assessment/ultrasound/laboratory findings: Incomplete septic abortion

Diagnosis: Incomplete septic abortion

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

Main treatment(s) given: IV fluids, antibiotics

Time between diagnosis of complication and appropriate treatment: 3 hours

Complementary tests and laboratory results after treatment:

Summary of case evolution and monitoring put in place (t°, BP, pulse, and bleeding): The woman was admitted and put on IV fluids and antibiotics and given a blood transfusion. Central venous catheterisation was also done. She was taken to the theatre for evacuation of the products of conception, which was found to be foul smelling. She developed persistent hypotension with BP 49/25 mmHg, pulse 120 bpm, temperature 36.6°C, haemoglobin: 6gm/dl, and was not responding to the fluids.

Date of death: 01 December 2017

Time elapsed between complication and death: 5 hours

Cause of death notified in records: Incomplete septic abortion

Pregnancy outcome (live birth, stillbirth, early death, miscarriage): Miscarriage

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

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

A 23-year-old woman was admitted to the hospital at 12 weeks' gestation in a general poor health with low blood pressure and tachycardia. She had blood pressure of 49/25 mmHg, tachycardia (120 beats/min), and body temperature of 36.6°C. She said she was given some herbs by a woman in the village to insert into her vagina to try to end the pregnancy. She was put on isotonic solution while further assessments were completed. Her haemoglobin was 6 grams/dL. Ultrasound revealed echogenic content suggestive of product of conception with free fluid in the uterus and pelvic cavity. She was taken to the theatre where an evacuation of the uterus was performed. Foul-smelling products of conception were removed. She was put on IV fluids and antibiotics. Despite aggressive hydration therapy including blood products, by central venous catheterisation, she had persistent bradycardia and hypotension. The woman died after five hours despite all the efforts.

SCENARIO 1: POSTPARTUM HAEMORRHAGE (PPH)

TABLE 3. CLINICAL SUMMARY FORM: PPH

Date of MDR: 25 July 2016 **MDR session N°:** 001

Patient code: Patient002

Patient age: 35 years

Marital status: ☒ Married/cohabitant ☐ Divorced ☐ Single

Gravida: 1 **Para:** 4 **Live children:** 4

Number of previous caesarean sections: 0 **Date of last C/S:** N/A

Prior obstetric complications: Retained placenta

Pre-existing medical problems: Anaemia

Number of antenatal care visits in this pregnancy: 3

Risk factor(s)/complications detected during this pregnancy/labour: Anaemia

If delivered/aborted before admission:

Date: **Duration of amenorrhea:** **Live baby:** ☐ Yes ☐ No

Place of birth/abortion: **Assisted by:**

Complications occurred: ☐ Yes ☐ No

If pregnant on admission:

Duration of amenorrhea: 38 weeks

Referred from another institution: ☐ Yes ☐ No **Type of institution?**

Reason for coming to hospital: Labour pains

History of the referral/process of reaching the institution: None

What associated factors may have contributed to this death (e.g., woman's status in community)? None

Date and time of admission: 17 July 2016, 12:00 am

Main reason for admission: Normal labour

Initial clinical assessment/ultrasound/laboratory findings at admission: Patient stable but has regular abdominal pains consistent with labour. Foetal heart sound 120 beats/min, BP 110/70 mmHg, Hb 9 grams/dl, urine examination normal. On examination, cervix dilated 8 cm; membranes intact.

Diagnosis made at admission: Normal labour

Summary of the case evolution if complication(s) occurred after admission: The woman was admitted to the labour ward for observation and to the delivery room where she delivered normally. However, after two hours she developed severe vaginal bleeding. She was taken back for evaluation and given IV oxytocin 20 IU.

Sequence of events if abortion/delivery occurred: See above

Complications: Bleeding after delivery

Clinical assessment/ultrasound/laboratory findings: None

Diagnosis: Postpartum haemorrhage

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

Main treatment(s) given: IV fluids, antibiotics, 20 IU of oxytocin

Time between diagnosis of complication and appropriate treatment: 4 hours

Complementary tests and laboratory results after treatment: None

Summary of case evolution and monitoring put in place (t°, BP, pulse and bleeding): After delivery, the woman was admitted to the ward for observation before discharge. After two hours, she complained of drowsiness and the midwife was called. She found that her vital signs were abnormal with blood pressure of 90/60 and a pulse rate of 100 per minute and temperature of 37°C. On examining the woman, the midwife found she had vaginal bleeding and her uterus was soft. The woman was immediately put on 1,000 ml of normal saline solution. The midwife re-examined her and found that her uterus was still soft and added 20 IU of oxytocin. When bleeding did not stop, she was rushed to the labour room for a full examination, which found no cervical tears and she was returned to the ward. The doctor ordered two pints of blood; however, blood was not available. The woman went into hypovolemic shock and died three hours later.

Date of death: 19 July 2016

Time elapsed between complication and death: 3 hours

Cause of death notified in records: Postpartum haemorrhage due to uterine atony

Pregnancy outcome (live birth, stillbirth, early death, miscarriage): A live baby weighing 2,200 grams.

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

CLINICAL SUMMARY FORM: PPH

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

A gravida 5 para 4, 35-year-old came to the hospital in the early hours of the morning. She attended three antenatal care visits during the pregnancy, and everything was normal except for mild anaemia. On examination, she was found to be in labour and was admitted into the labour room. Her vital signs and laboratory tests were collected and registered: blood pressure was 110/70, Hb 9 gm/dl, temperature 37°C. Her pains intensified after one hour and she delivered a live baby at 9:00 am, weighing 2,200 grams. She was transferred to the ward and was planned to be discharged after two hours. However, the patient informed the midwife in the ward that she was feeling drowsy. When she examined the patient, the midwife found that her BP was 90/60 and she was bleeding profusely on the bed. A new IV line was inserted, and infusion of 1,000 ml of normal saline solution was started. The midwife re-examined the woman and found that her uterus was soft and added 20 IU of oxytocin. The bleeding, however, did not stop. She was transferred to the labour room for proper examination. On examination, no cervical tears could be seen. She was returned to the ward and placed on constant monitoring of her vital signs. The doctor was called, and he ordered that two pints of blood be transfused immediately; however, there was no blood available. The woman went into hypovolemic shock and died three hours later.

SCENARIO 2: UTERINE RUPTURE

TABLE 4. CLINICAL SUMMARY FORM: UTERINE RUPTURE

Date of MDR: 14 September 2017 **MDR session N°:** 002

Patient code: Patient003 **Patient age:** 39 years

Marital status: ☒ Married/cohabitant ☐ Divorced ☐ Single

Gravida: 8 **Para:** 0 **Live children:** 7

Number of previous caesarean sections: 0 **Date of last C/S:** N/A

Prior obstetric complications: None

Pre-existing medical problems: None

Number of ANC visits in this pregnancy: 2

Risk factor(s)/complications detected during this pregnancy/labour: None

If delivered/aborted before admission: No

Date: **Duration of amenorrhea:** **Live baby:** ☐Yes ☐No

Place of birth/abortion: **Assisted by:**

Complications occurred: ☐ Yes ☐ No

If pregnant on admission:

Duration of amenorrhea: 38 weeks

Referred from another institution: ☒ Yes ☐ No **Type of institution?** Health centre

Reason for coming to hospital: Abdominal pains and vaginal bleeding

History of the referral/process of reaching the institution: The woman was in labour for 20 hours at the rural health centre. When she did not deliver and started to have vaginal bleeding, the midwife decided to refer her to the main hospital in the town using a pickup truck rented by the family because the community ambulance had no fuel.

What associated factors may have contributed to this death (e.g., woman's status in community)? None

Date and time of admission: 03 September 2017, 12:00 pm

Main reason for admission: Labour pains and vaginal bleeding

Initial clinical assessment/ultrasound/laboratory findings at admission: The woman was in pain and had vaginal bleeding**.** On examination, she was weak and pale and had a tender abdomen and no foetal heart sound could be heard. Her BP was 90/50 mmHg, pulse rate 110 per minute, and respiratory rate of 50 per minute. Haemoglobin was requested and found to be 4 grams/dl. An ultrasound scan revealed the foetus in the abdominal cavity and significant free fluid in the peritoneum.

Diagnosis made at admission:

Summary of the case evolution if complication(s) occurred after admission: The doctor immediately made a diagnosis of uterine rupture.

Sequence of events if abortion/delivery occurred: No delivery occurred

Complications: Abdominal pain, vaginal bleeding

Clinical assessment/ultrasound/laboratory findings: The woman appeared clinically dehydrated, with concentrated urine. On examination, there were no foetal heart sounds and there was generalised abdominal tenderness with distention. Ultrasound revealed significant free fluid in the peritoneum and the foetus in the abdominal cavity

Diagnosis: Ruptured uterus

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

Main treatment(s) given: IV antibiotics, 2 litres of IV normal saline, an ultrasound scan

Time between diagnosis of complication and appropriate treatment: 1 hour **Complementary tests and**

laboratory results after treatment: None

Summary of case evolution and monitoring put in place (t°, BP, pulse, and bleeding): A senior doctor was called but did not arrive. A junior doctor decided to conduct an emergency exploratory laparotomy. A posterior uterine rupture in a transverse direction was found, with blood-stained fluids visible on the intra-abdominal organs. A nonviable foetus was delivered from the abdominal cavity. A subtotal hysterectomy was performed by a junior doctor and the abdomen was washed out and closed. The woman's condition deteriorated in the recovery ward and she died two hours later.

Date of death: 03 September 2017

Time elapsed between complication and death: 5 hours

Cause of death notified in records: Ruptured uterus

Pregnancy outcome (live birth, stillbirth, early death, miscarriage): Stillbirth; 2,900 grams

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

CLINICAL SUMMARY FORM: UTERINE RUPTURE

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

A 39-year old gravida 8 para 7 presented with severe labour pains at the main hospital after a referral from a local health centre. She had attended two antenatal care visits. She reported no previous medical or surgical history. Her blood pressure and haemoglobin were normal. After more than 20 hours, she developed severe abdominal pain and vaginal bleeding. The midwife at the health centre referred her to the hospital when the labour did not progress. The relatives rented a pickup truck to transport her since the health facility ambulance had no fuel. At the hospital, she was found to have a pulse rate of 110 per minute, respiratory rate 50 per minute, and BP 90/50mmHg. No temperature was recorded. She appeared clinically dehydrated, with concentrated urine. On examination, foetal heart sounds were not heard and there was generalised abdominal tenderness. The woman was given IV antibiotics and 2 litres of IV normal saline. An ultrasound scan showed a foetus in the abdominal cavity and significant free fluid in the peritoneum. The senior doctor was called but did not arrive. A decision was made for exploratory laparotomy by a junior doctor. A posterior uterine rupture in a transverse direction was found, with blood-stained fluids visible on the intra-abdominal organs. A nonviable male foetus weighing 2,900 grams was delivered through the abdomen and a subtotal hysterectomy was performed. The abdomen was washed out and closed. The woman's condition deteriorated and she died after two hours.

SCENARIO 3: PRE-ECLAMPSIA AND ECLAMPSIA (PE/E)

TABLE 5. CLINICAL SUMMARY FORM: PE/E

Date of MDR: 10 June 2017 **MDR session N°:** 003

Patient code: Patient004 **Patient age:** 38 Years

Marital status: ☒ Married/cohabitant ☐ Divorced ☐ Single

Gravida: 1 **Para:** 0 **Live children:** 0

Number of previous caesarean sections: 0 **Date of last C/S:** N/A

Prior obstetric complications: Gestational hypertension

Pre-existing medical problems: None

Number of ANC visits in this pregnancy: 3

Risk factor(s)/complications detected during this pregnancy/labour: None

If delivered/aborted before admission: None

Date: **Duration of amenorrhea:** **Live baby:** ☐ Yes ☐ No

Place of birth/abortion: **Assisted by:**

Complications occurred: ☐ Yes ☐ No

If pregnant on admission:

Duration of amenorrhea: 36 weeks

Referred from another institution? ☐ Yes ☒ No **Type of institution?**

Reason for coming to hospital: Severe headache

History of the referral/process of reaching the institution:

What associated factors may have contributed to this death (e.g., woman's status in community)?

Date and time of admission: 05 June 2017, 6:00 pm

Main reason for admission: Pregnancy with severe headache and high blood pressure

Initial clinical assessment/ultrasound/laboratory findings at admission: Blood pressure of 180/110, lower limb oedema, uterine fundus height of 30 cm, closed cervix, no uterine contractions, and foetal heart sound heard.

Diagnosis made at admission: Pre-eclampsia

Summary of the case evolution if complication(s) occurred after admission: Following assessment, the woman was transferred immediately to the delivery room where she had her first eclamptic fit. The nurses waited for the obstetrician before initiating the loading dose of magnesium sulphate. The obstetrician arrived one hour after the woman's first eclamptic fit and started management with magnesium sulphate and antihypertensive.

Sequence of events if abortion/delivery occurred: See above

Complications: Fits/seizures

Clinical assessment/ultrasound/laboratory findings:

Diagnosis: Eclampsia

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

Main treatment(s) given: A urinary catheter and intravenous line were placed; antihypertensive treatment and loading dose of magnesium sulphate. The woman was transferred to the intensive care unit.

Time between diagnosis of complication and appropriate treatment: 1 hour

Complementary tests and laboratory results after treatment: None. The ultrasound revealed a live foetus of 36 weeks.

Summary of case evolution and monitoring put in place (t°, BP, pulse, and bleeding): A caesarean section was performed in the central block at 8 pm. The obstetrician extracted a live male baby (Apgar 6), who was transferred to the paediatric ward. During the postoperative period, vital signs were hardly monitored at all (BP taken three hours after surgery). The woman went into a coma in the intensive care unit and died 16 hours after admission.

Date of death: 06 June 2017

Time elapsed between complication and death: 16 hours

Cause of death notified in records: Eclampsia

Pregnancy outcome (live birth, stillbirth, early death, miscarriage): A live infant weighing 2,300g

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

CLINICAL SUMMARY FORM: PE/E

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

Primigravida, 38 years old, with a history of gestational hypertension admitted at 6 pm with severe headache. She had attended three antenatal care visits at the health facility and her pregnancy was progressing normally. On admission, her blood pressure was 180/110, lower limb oedema, uterine fundus height of 30 cm, closed cervix, no uterine contractions, and positive foetal heart sounds were heard. Following assessment, the woman was transferred immediately to the delivery room where she had her first eclamptic fit. The nurses waited for the obstetrician before initiating the loading dose of magnesium sulphate. Once the obstetrician arrived (one hour after the eclamptic fit began), management started. A urinary catheter and intravenous line were placed, loading dose of magnesium sulphate and antihypertensive treatment was then started in the delivery room. The woman was transferred to the intensive care unit. Laboratory investigations were requested (white blood cells, electrolytes, glucose, urea, and creatinine) and this was recorded in the patient record, but the results were not available. An ultrasound was requested to assess gestational age and foetal viability. The ultrasound revealed a live foetus of 36 weeks and the decision to perform a caesarean section was made. A caesarean section was performed at 8:00 pm. The obstetrician extracted a live infant weighing 2,300g (Apgar 6), who was transferred to the paediatric ward. During the postoperative period, vital signs were hardly monitored at all (BP taken three hours after surgery). The woman went into coma in intensive care unit and died 16 hours after admission.

SCENARIO 4: ANAESTHESIA

TABLE 6. CLINICAL SUMMARY FORM: ANAESTHESIA

Date of MDR: 16 March 2015 **MDR session N°:** 005

Patient code: Patient005 **Patient age:** 29

Marital status: ☒ Married/cohabitant ☐ Divorced ☐ Single

Gravida: 3 **Para:** 2 **Live children:** 1

Number of previous caesarean sections: 0 **Date of last C/S:** N/A

Prior obstetric complications: None

Pre-existing medical problems: Asthma

Number of antenatal care visits in this pregnancy: 3

Risk factor(s)/complications detected during this pregnancy/labour: None

If delivered/aborted before admission: No

Date: **Duration of amenorrhea:** **Live baby:** ☐ Yes ☐ No

Place of birth/abortion: **Assisted by:**

Complications occurred: ☐ Yes ☐ No

If pregnant on admission:

Duration of amenorrhea: 40 weeks

Referred from another institution: ☐ Yes ☒ No **Type of institution** Unknown

Reason for coming to hospital: Labour

History of the referral/process of reaching the institution: None

What associated factors may have contributed to this death (e.g., woman's status in community)? None

Date and time of admission: 04 March 2015, 4:00 am

Main reason for admission: Normal labour

Initial clinical assessment/ultrasound/laboratory findings at admission: On examination, the patient's BP was 120/80 mmHg, pulse rate was 80 beats per minute and the foetal heart sound was 120 per minute. Her haemoglobin and urine exams were normal. On vaginal examinations, the cervix was open 4 cm, the membranes were intact, and no discharge of fluids was seen.

Diagnosis made at admission: Normal labour

Summary of the case evolution if complication(s) occurred after admission: The patient was admitted in the labour room and her progress monitored by partograph. Four hours later, her membranes broke, which was meconium stained. The foetal heart sound was 90 beats per minute and the cervix was 8 cm dilated, but the head was still high. A decision was made to perform an emergency caesarean section due to foetal distress.

Sequence of events if abortion/delivery occurred: See summary

Complications: Foetal distress

Clinical assessment/ultrasound/laboratory findings:

Diagnosis: Foetal distress

How did the woman's status in the community affect the process after admission in this particular case? None

Main treatment(s) given: An emergency caesarean section was performed under general anaesthesia (because spinal anaesthesia failed). Anaesthesia was administered by an anaesthetic assistant with limited experience. A live foetus weighing 2,800 grams was delivered. After closure of the abdomen, the patient did not wake up from anaesthesia and had difficulty breathing on her own. Breathing was assisted by bag and mask, and she was put on IV fluids and taken to the ICU but died a few hours later.

Time between diagnosis of complication and appropriate treatment: 1 hour

Complementary tests and laboratory results after treatment: HB 10 grams/ld., urine normal

Summary of case evolution and monitoring put in place (t°, BP, pulse, and bleeding): Temperature 36°C, BP 90/60 mmHg, pulse 100 bpm, no vaginal bleeding

Date of death: 06 March 2015

Time elapsed between complication and death: 6 hours

Cause of death notified in records: Complications of anaesthesia (failed spinal anaesthesia)

Pregnancy outcome (live birth, stillbirth, early death, miscarriage): Live baby, male, weighing 2,800 grams

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

The woman's first child, who was fully immunised, died of pneumonia at age two years.

CLINICAL SUMMARY FORM: ANAESTHESIA

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

A 29-year-old gravida 3 para 2 woman with a medical history of asthma presented to the labour room at the health facility in labour and was admitted. She previously had two antenatal care visits at the same facility. On examination, her BP was 120/80 mmHg, pulse rate 80 beats per minute, and the foetal heart sound was 120 per minute. Her haemoglobin and urine exams were normal. On vaginal examination, the cervix was open 4 cm, the membranes were intact, and no discharge of fluids was seen. She was admitted into the labour room and the progress of labour monitored using a partograph. Four hours later, the membranes broke. The amniotic fluid was meconium stained. The foetal heart sound was 90 beats per minute and the cervix was 8 cm dilated, but the head was still high. A decision was made to perform an emergency caesarean section due to foetal distress. The woman was taken to the theatre and operated on under general anaesthesia, after a first attempt at spinal anaesthesia failed.

Anaesthesia was administered by an anaesthetic assistant with limited experience. A live baby weighing 2,800 grams was delivered. When the operation was completed, the woman did not wake up and experienced respiratory distress. Her vital signs dropped: her blood pressure was 90/50 mmHg and she was unable to breathe on her own. She was assisted with bag and mask ventilation and was put on IV fluids and taken to the ICU, where she died a few hours later.

ANNEX VIII A: ICD-10 MM REFERENCE AID

FIGURE 2. GROUPS OF THE UNDERLYING CAUSE OF DEATH DURING PREGNANCY, CHILDBIRTH, AND PUERPERIUM

Definitions of Deaths

Death occurring during pregnancy, childbirth, and the puerperium is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death.

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

Late maternal death is the death of a woman from direct or indirect causes more than 42 days but less than one year after termination of pregnancy.

Underlying cause of death is defined as the disease or condition that initiated the morbid chain of events leading to death or the circumstances of the accident or violence that produces a fatal injury. The single identified cause of death should be as specific as possible (ICD-10).

ANNEX VIII B: DEFINITIONS OF CAUSE GROUPS WITH EXAMPLES

Categories of underlying causes of death are aggregated in nine groups of causes of death during pregnancy, childbirth, and the puerperium. These groups are clinically and epidemiologically relevant, mutually exclusive, and totally inclusive and descriptive of all causes of maternal and pregnancy-related deaths.

TABLE 7. GROUPS OF UNDERLYING CAUSES OF DEATH DURING PREGNANCY, CHILDBIRTH, AND THE PUERPERIUM IN MUTUALLY EXCLUSIVE, TOTALLY INCLUSIVE GROUPS[9]

Type	Group name/number	Examples of potential causes of death
Maternal death: direct	1. Pregnancies with abortive outcome	Abortion, miscarriage, ectopic pregnancy, and other conditions leading to maternal death and a pregnancy with abortive outcome
Maternal death: direct	2. Hypertensive disorders in pregnancy, childbirth and the puerperium	Hypertensive disorders of pregnancy, childbirth, and puerperium including pre-eclampsia, eclampsia and gestational hypertension[10]
Maternal death: direct	3. Obstetric haemorrhage	Obstetric diseases or conditions directly associated with haemorrhage
Maternal death: direct	4. Pregnancy-related infection	Pregnancy-related, infection-based diseases or conditions
Maternal death: direct	5. Other obstetric complications	All other direct obstetric conditions not included in groups 1–4
Maternal death: direct	6. Unanticipated complications of management	Severe adverse effects and other unanticipated complications of medical and surgical care during pregnancy, childbirth, or the puerperium

[9] Adapted from World Health Organization (2012) The WHO Application of ICD-10 to deaths during pregnancy, childbirth and puerperium: ICD-10 MM. World Health Organization.

[10] World Health Organization and UNICEF (2017) Managing complications in pregnancy and childbirth: a guide for midwives and doctors. World Health Organization and UNICEF.

Maternal death: indirect	7. Non-obstetric complications	Non-obstetric conditions: • Cardiac disease (including pre-existing hypertension) • Endocrine conditions • Gastrointestinal tract conditions • Central nervous system conditions • Respiratory conditions • Genitourinary conditions • Autoimmune disorders • Skeletal diseases • Psychiatric disorders • Neoplasms • Infections that are not a direct result of pregnancy
Maternal death: unspecified[11]	8. Unknown/ undetermined	Maternal death during pregnancy, childbirth, and the puerperium where the underlying cause is unknown or was not determined
Death during pregnancy, childbirth, and the puerperium	9. Coincidental causes	Death during pregnancy, childbirth, and the puerperium due to external causes

[11] In some settings, teams mark the cause of death as unspecified to avoid litigation or disciplinary action. It is important to foster a no-blame atmosphere to promote learning and action as a result of a maternal death, a primary goal of MPDSR. The death should be marked as unspecified only when the cause of death truly cannot be ascertained.

ANNEX IX: MEDICAL CERTIFICATE OF CAUSE OF DEATH FORM

MCCD FORM EXAMPLES

EXAMPLE 1:

A woman who had anaemia during pregnancy and after delivery had a postpartum haemorrhage due to uterine atony and died as a result of hypovolaemic shock.

Cause of death *the disease or condition thought to be the underlying cause should appear in the lowest completed line of Part I*		Approximate interval between onset and death
1. Disease or condition leading directly to death	(a) hypovolaemic shock A contributory cause indicated in Part 1. This is assigned a code when multiple cause coding is undertaken	10 minutes
Antecedent causes: Due to or as a consequence of	(b) postpartum haemorrhage	30 minutes
Due to or as a consequence of	(c) uterine atony The underlying cause. This is the last condition noted in Part 1 and is a condition found in Annex B1	45 minutes
Due to or as a consequence of	(d)	
2. Other significant conditions Contributing to death but not related to the disease or condition causing it	Anaemia	pre-existing
The woman was: ☐ pregnant at the time of death ☒ not pregnant at the time of death (but pregnant within 42 days) ☐ pregnant within the past year		

If the deceased was a woman, was she pregnant when she died or within 42 days before she died?
Yes

(Part I shaded for purposes of the example.)

EXAMPLE 2:

A woman living with HIV who has a spontaneous abortion that becomes infected dies due to septic shock and renal failure.

Cause of death *the disease or condition thought to be the underlying cause should appear in the lowest completed line of Part I*		Approximate interval between onset and death
1. Disease or condition leading directly to death	(a) renal failure	2 hours
Antecedent causes: Due to or as a consequence of	(b) septic shock	24 hours
Due to or as a consequence of	(c) septic miscarriage	36 hours
Due to or as a consequence of	(d)	
2 . Other significant conditions Contributing to death but not related to the disease or condition causing it	HIV	pre-existing
The woman was: ☒ pregnant at the time of death ☐ not pregnant at the time of death (but pregnant within 42 days) ☐ pregnant within the past year		

A contributory condition, indicated in Part 1

The underlying cause. This is the last condition noted in Part 1 and is a condition found in Annex B

A contributory condition, indicated in Part IIB

If deceased was a woman, was she pregnant when she died or within 42 days before she died? *Yes*

(Part I shaded for purposes of the example.)

If the death certificate has been completed correctly, the underlying cause of death should be the single condition that the certifier has written on the last completed line of Part 1(d).[12]

TABLE 8. MCCD FOR EXAMPLE A: ABORTION

Cause of death *(The disease or condition thought to be the underlying cause should appear in the last completed line of part I)*		**Approximate interval between onset and death**
Part I Disease or condition leading directly to death	a) Septic shock	5 hours
Antecedent causes: Due to or as a consequence of	b) Septicaemia	24 hours
Due to or as a consequence of	c) Septic incomplete abortion	72 hours
Due to or as a consequence of	d)	
Part II Other significant conditions contributing to death but not related to the disease or condition causing it		
The woman was: ☒ Pregnant at the time of death ☐ Not pregnant at the time of death (but pregnant within 42 days) ☐ Pregnant within the past year		

ICD-10 MM: Group 1

[12] World Health Organization (2012) The WHO Application of ICD-10 to deaths during pregnancy, childbirth and puerperium: ICD-10 MM. World Health Organization.

COMPLETED MCCD FORMS FOR SCENARIOS 1–4

TABLE 9. MCCD FOR SCENARIO 1: PPH

Cause of death *(The disease or condition thought to be the underlying cause should appear in the last completed line of part I)*		**Approximate interval between onset and death**
Part I Disease or condition leading directly to death	a) Hypovolemic shock	3 hours
Antecedent causes: Due to or as a consequence of	b) Postpartum haemorrhage	5 hours
Due to or as a consequence of	c) Uterine atony	6 hours
Due to or as a consequence of	d)	
Part II Other significant conditions contributing to death but not related to the disease or condition causing it		
The woman was: ☐ Pregnant at the time of death ☒ Not pregnant at the time of death (but pregnant within 42 days) ☐ Pregnant within the past year		

ICD-10 MM: Group 3

TABLE 10. MCCD FOR SCENARIO 2: UTERINE RUPTURE

Cause of death *(The disease or condition thought to be the underlying cause should appear in the last completed line of part I)*		**Approximate interval between onset and death**
Part I Disease or condition leading directly to death	a) Hypovolemic shock	1 hour
Antecedent causes: Due to or as a consequence of	b) Obstetric haemorrhage	3 hours
Due to or as a consequence of	c) Uterine rupture	5 hours
Due to or as a consequence of	d)	
Part II Other significant conditions contributing to death but not related to the disease or condition causing it		
The woman was: ☒ Pregnant at the time of death ☐ Not pregnant at the time of death (but pregnant within 42 days) ☐ Pregnant within the past year		

ICD-10 MM: Group 3

TABLE 11. MCCD FOR SCENARIO 3: PE/E

Cause of death *(The disease or condition thought to be the underlying cause should appear in the last completed line of part I)*		**Approximate interval between onset and death**
Part I Disease or condition leading directly to death	a) Cerebrovascular haemorrhage/stroke	16 hours
Antecedent causes: Due to or as a consequence of	b) High blood pressure	36 hours
Due to or as a consequence of	c) Pre-eclampsia/eclampsia	
Due to or as a consequence of	d)	
Part II Other significant conditions contributing to death but not related to the disease or condition causing it		
The woman was: ☒ Pregnant at the time of death ☐ Not pregnant at the time of death (but pregnant within 42 days) ☐ Pregnant within the past year		

ICD-10 MM: Group 2

TABLE 12. MCCD FOR SCENARIO 4: ANAESTHESIA

Cause of death *(The disease or condition thought to be the underlying cause should appear in the last completed line of part I)*		**Approximate interval between onset and death**
Part I Disease or condition leading directly to death	a) Brain damage/hypoxia	1 hour
Antecedent causes: Due to or as a consequence of	b) Complications of anaesthesia	3 hours
Due to or as a consequence of	c)	
Due to or as a consequence of	d)	
Part II Other significant conditions contributing to death but not related to the disease or condition causing it		
The woman was: ☐ Pregnant at the time of death ☒ Not pregnant at the time of death (but pregnant within 42 days) ☐ Pregnant within the past year		

ICD-10 MM: Group 6

ANNEX X: STILLBIRTH AND NEONATAL DEATH CASE REVIEW FORM

Section1: Identification					
1.1	ID# mother				
1.2	ID# baby				
1.3	Facility name				
1.4	Type of care available	**Comprehensive EmOC**	**Basic EmOC**	**First aid**	**Home delivery**
1.5	District name				
1.6	Referred	**Not referred**	**Referred in**		
			Referred out		

Section 2: Pregnancy progress and care									
2.1	Obstetric history								
		All pregnancies	All births	Total live births		Dead	Still-births	Neonatal deaths	Abortions
2.2	Mother's Age								
2.3	Type of pregnancy		Singleton	Twin		Higher multiple			Unknown
2.4	Antenatal care number of visits		4 or more	3	2	1	No visits		Unknown
Adjust as per local context									
2.5	Malaria prophylaxis								
	Not needed		IPT3+	IPT2	IPT1		Not received		Unknown
2.6	Tetanus toxoid vaccination		TT2+		TT1		Not received		Unknown
2.7	HIV status		HIV-negative	HIV-positive			Not done		Unknown
	2.7.1 HIV-positive action			NVP	HAART		Other, specify		
2.8	Syphilis test		Syphilis-negative	Syphilis-positive			Not done		Unknown

Section 3: Labour and birth								
3.1	Mother's LMP	DD	MM	YY	Unknown			
3.2	Date of birth	DD	YY	YY				
	3.2.1 Time of birth	h						
3.3	Gestational age			weeks	Unknown			
	3.3.1 Method of determination		Sure LMP dates		Unsure LMP dates		Other, specify	
			Early ultrasound		Late ultrasound			
3.4	Place of delivery			Facility	Home	Road	Other, specify	Unknown
	3.4.1 Attendant at delivery	Midwife	Nurse	Doctor	Other, specify		No one	Unknown
3.5	Onset of labour			Spontaneous	Induced	C/S before onset		Unknown
3.6	Foetal heart sounds on admission			No	Yes			Unknown
3.7	Partograph used			No	Yes			Unknown
3.8	Mode of delivery			CVD	Assisted vaginal	Caesarean	Other, specify	Unknown
3.9	Time between decision for action and birth		n/a	<30 mins	30–60 mins	>60 mins		Unknown
3.10	Apgar score		1 min =	4 or more	3 or less			Unknown
			5 min =	4 or more	3 or less			
3.11	Resuscitation	Not needed		Bag + mask	Not done	Other, specify stillbirth		Unknown
3.12	Sex of baby		Male	Female				Unknown
3.13	Birth weight		g	≥2500g	1500–2499g	1000–1499g	<1000g	Unknown
					LBW	VLBW	ELBW	

Section 4: Details of the death													
4.1	Date of death	DD	MM	YY	4.2 Type of death (tick one)								
	4.1.1 Time of death	: H			Neonatal death	Intrapartum stillbirth	Antepartum stillbirth	Stillbirth unknown timing					
4.2	Enter the perinatal cause of death as per ICD-10 PM in the corresponding box												
4.3	Main maternal condition				Main maternal condition followed by the corresponding number. Use the reference below to write in the corresponding number. Include more than one if applicable.			Unknown					
4.4	Cause of death (circle one)				**M1**	**M2**	**M3**	**M4**	**M5**	**Other**	**Unknown**		
	a. Congenital												
	b. Antepartum complication												
	c. Intrapartum complication												
	d. Complication of prematurity												
	e. Infection	Tetanus	Sepsis	Pneumonia	Meningitis								
		Syphilis	Diarrhoea	Other, specify if known									
	f. Other, specify												
	g. Unknown/unspecified												

Section 5: Critical delays and modifiable factors			
5.1	Critical delays	Delay 1: Not identified	1. Delay recognising need of care
		Delay 2: Not identified	2. Delay seeking care
		Delay 3: Not identified	3. Delay receiving care
5.2	Modifiable factors		
	Family related	None identified	Specify
	Late/no antenatal care; cultural inhibition to seeking care; no knowledge of danger signs; financial constraints; partner restricts care-seeking; use of traditional/herbal medicine; smoking/drug or alcohol abuse; attempted termination; etc.		
	Administration related	None identified	Specify
	Neonatal facilities; theatre facilities; resuscitation equipment; blood products; lack of training; insufficient staff numbers; anaesthetic delay; no antenatal documentation; etc.		
	Provider related	None identified	Specify
	Partograph/labour care guide not used; action not taken; inappropriate action taken; iatrogenic delivery; delay in referral; inadequate monitoring; delay in calling for assistance; inappropriate discharge; etc.		
	Other	None identified	Specify
Actions to address the critical delays and modifiable factors			
Form completed by		Date	
c/s: caesarean section; CVD: cephalic vaginal delivery; ELBW: extremely low birth weight; EmOC: emergency obstetric care; HAART: highly active antiretroviral therapy; HIV: human immunodeficiency virus; IPT: intermittent preventive treatment; LBW: low birth weight; LMP: last menstrual period; NVP: nevirapine prophylaxis; TT: tetanus toxoid; VLBW: very low birth weight			

Source: World Health Organization. 2016. Making Every Baby Count: Audit and review of stillbirths and neonatal deaths.

ANNEX XI A: ICD-10 PM REFERENCE AID

WHO PREGNANCY OUTCOME DEFINITIONS

Source: adapted from Lawn et al., 2011 *(23)*.

ANNEX XI B: ICD-10 PM REFERENCE AID

ANNEX XI C: MATERNAL CONDITION IN ICD-10 PM

ICD-10 PM maternal condition group	Main maternal condition included in group	ICD-10 PM maternal condition group	Main maternal condition included in group
M1: Complications of placenta, cord, and membranes	1. Placenta previa 2. Other forms of placental separation and haemorrhage 3. Placental dysfunction, infarction, insufficiency 4. Foetal-placental transfusion syndromes 5. Prolapsed cord, other compression of umbilical cord 6. Chorioamnionitis 7. Other complications of membranes	**M4: Maternal medical and surgical conditions**	1. Pre-eclampsia, eclampsia 2. Gestational hypertension 3. Other hypertensive disorders 4. Renal and urinary tract diseases 5. Infectious and parasitic disease 6. Circulatory and respiratory disease 7. Nutritional disorders 8. Injury 9. Surgical procedure 10. Other medical procedures 11. Maternal diabetes, including gestational diabetes 12. Maternal anaesthesia and analgesia 13. Maternal medication 14. Tobacco/alcohol/drug addiction 15. Nutritional chemical substances 16. Environmental chemical substances 17. Unspecified maternal condition
M2: Maternal complications of pregnancy	1. Incompetent cervix 2. Preterm rupture of membranes 3. Oligohydramnios/polyhydramnios 4. Ectopic pregnancy 5. Multiple pregnancy 6. Maternal death 7. Malpresentation before labour 8. Other complications of pregnancy		
M3: Other complications of labour and delivery	1. Breech delivery and extraction 2. Other malpresentation, malposition, and disproportion during labour and delivery 3. Forceps delivery/vacuum extraction 4. Caesarean delivery 5. Precipitate delivery 6. Preterm labour and delivery 7. Other complications of labour and delivery, including termination of pregnancy	**M5: No maternal condition**	1. No maternal condition identified (healthy mother)

Source: ICD-10 PM

ANNEX XII: ICD-10 PM TABULATION FOR PERINATAL CAUSE OF DEATH AND MATERNAL CONDITION SEPARATED BY TIMING OF DEATH

Perinatal cause of death	Maternal condition						
	M1: Complications of placenta, cord, and	M2: Maternal complications of pregnancy	M3: Other complications of labour and delivery	M4: Maternal medical and surgical conditions	M5: No maternal condition identified	Other	**Total (%)**
Antepartum death (A)							
A1: Congenital malformations, deformations, and chromosomal abnormalities							
A2: Infection							
A3: Antepartum hypoxia							
A4: Other specified antepartum disorder							
A5: Disorders related to foetal growth							
A6: Foetal death of unspecified cause							
Total (%)							
Intrapartum death (I)							
I1: Congenital malformations, deformations, and chromosomal abnormalities							
I2: Birth trauma							
I3: Acute intrapartum event							
I4: Infection							
I4: Other specified intrapartum disorder							
I5: Disorders related to foetal growth							
I6: Intrapartum death of unspecified cause							
Total (%)							

Perinatal cause of death	Maternal condition						
	M1: Complications of placenta, cord, and	M2: Maternal complications of pregnancy	M3: Other complications of labour and delivery	M4: Maternal medical and surgical conditions	M5: No maternal condition identified	Other	**Total (%)**
Neonatal death (N)							
N1: Congenital malformations, deformations, and chromosomal abnormalities							
N2: Disorders related to foetal growth							
N3: Birth trauma							
N4: Complications of intrapartum events							
N5: Convulsions and disorders of cerebral status							
N6: Infection							
N7: Respiratory and cardiovascular disorders							
N8: Other neonatal conditions							
N9: Low birthweight and prematurity							
N10: Miscellaneous							
N11: Neonatal death of unspecified cause							
Total (%)							

ANNEX XIII: ASSIGNING CAUSE FOLLOWING ICD-10 PM

EXAMPLE: CASE 1

A 19-year-old para 1, with a certain gestation of 38 weeks based on early clinical examination, presented in a healthy condition during labour with no significant history. A 2,450g baby was delivered after an eight-hour labour. On day 2 of life, the baby died from meconium aspiration syndrome. Clinical review of the case identified the following potentially modifiable factors in the early neonatal death: foetal distress not detected in labour and personnel too junior to manage the patient.

The neonatal cause of death is meconium aspiration syndrome. The maternal condition is no maternal condition identified at the time of perinatal death. The time of the death is neonatal.

The death certificate was completed by the clinicians, and subsequently coded as follows:

<table>
<tr><th>Causes of death</th><th>Clinical details</th><th>ICD-10 PM</th></tr>
<tr><td>a) Main disease or condition in foetus or infant</td><td>Meconium aspiration syndrome</td><td rowspan="4">N7, M5</td></tr>
<tr><td>b) Other diseases of conditions in foetus or infant</td><td>Small for gestational age</td></tr>
<tr><td>c) Main maternal disease or condition affecting foetus or infant</td><td rowspan="2">No maternal condition</td></tr>
<tr><td>d) Other maternal diseases or conditions affecting foetus or infant</td></tr>
</table>

Source: ICD-10 PM

This case highlights the need to have “no maternal condition” identified as the maternal code at the time of perinatal death, as the ability to predict this death antenatally is limited. It also highlights the need for personnel to continue to be trained in intrapartum care and obstetric emergencies.

EXAMPLE: CASE 2

A 30-year-old para 1 presented in labour at 39 weeks of gestation, based on a certain last menstrual period, with the foetus alive at admission. The woman was HIV-positive and on long-term antiretroviral therapy. There was poor progress in labour, with incorrect interpretation of the partograph/labour care guide. An acute intrapartum event occurred with a hypoxic intrapartum stillbirth. The foetus was delivered via caesarean section.

The intrapartum cause of death is intrapartum hypoxia, with the maternal condition of obstructed labour.

The death certificate was completed by the clinicians, and subsequently coded as follows:

Causes of death	Clinical details	ICD-10 PM
a) Main disease or condition in foetus or infant	Intrauterine hypoxia	**13, M3**
b) Other diseases of conditions in foetus or infant		
c) Main maternal disease or condition affecting foetus or infant	Obstructed labour	
d) Other maternal diseases or conditions affecting foetus or infant	HIV	

Source: ICD-10 PM

This case highlights the need to capture maternal conditions other than HIV.

ANNEX XIV: CASE STUDIES ON PERINATAL MORTALITY AUDIT WITH ANSWER KEYS

CASE STUDY 1: EARLY NEONATAL DEATH

Zeinab Mohammed married one year ago and is a 17-year-old primigravida from a nearby district. Her husband Hassan is a rich businessman and she is his third wife. When she was 20 weeks pregnant, she noticed some foul-smelling vaginal discharge, and went to the antenatal clinic at the nearby hospital. It was her first antenatal care visit. At the booking visit, the midwife took her full history and filled in a card, measured her weight and blood pressure, checked her blood group and blood haemoglobin levels, palpated her abdomen, listened to the heart sounds of the foetus, and told her everything was fine with her and the child. The midwife gave Zeinab a tetanus injection, prescribed her iron and folic acid tablets, and gave her three antimalarial tablets to take at the clinic. When Zeinab mentioned her discharge, the midwife did not examine her but told her that that was normal during pregnancy and that she should not worry.

Zeinab went one more time to the antenatal clinic when she was 34 weeks pregnant, received the same treatment, and went home. When she was 38 weeks pregnant, she had labour pains and was taken by her mother in-law to the maternity ward in the hospital. On admission, she had moderate contractions, the fundal height corresponded to term, the baby was laying in longitudinal lie and cephalic presentation, and the head was 4/5 above the pelvis. The foetal heart rate was 130/min. On vaginal examination, she was 4 cm dilated and the membranes were intact. The midwife recorded the findings on the partograph. Zeinab was taken to the labour suite. Four hours later, her membranes ruptured spontaneously. The liquor was slightly meconium stained. The head was now 3/5 above the brim of the pelvis. Cervical dilatation at that time was 6 cm. Foetal heart rate was 120/min. Four hours later, the contractions were strong, four in 10 minutes, the foetal head 2/5 above the brim, and the cervix was 8 cm dilated. The foetal heart rate was 124/min. Zeinab was becoming tired and the contractions were very painful. Finally, after 11 hours of labour she was fully dilated. The midwife told her to push with each contraction. After pushing for more than one hour, she delivered a 3.8 kg male infant.

The baby was pale, did not immediately cry after birth, and was breathing irregularly. The midwife sucked out the nose and mouth and slapped the baby on its back. There was no Ambu bag and mask in the labour room. After some time, the baby improved, but was still grunting a bit while breathing. The Apgar score was 3 after one minute and 7 after five minutes. The midwife wiped the baby dry and wrapped it in a cloth. Then she administered 10 units of oxytocin to the mother and delivered the placenta by controlled cord traction. Blood loss during delivery was 300 ml. The perineum was intact. Later that day, the baby had improved and was able to suck the breast, but he was still grunting a bit when breathing. The next day the baby had a fever of 38.8 oC. The midwife called the doctor and he prescribed antimalarials and ordered tepid sponging and monitoring the baby's temperature every six hours. However, the temperature was only recorded twice that day. The next day, the baby still had a fever and was a bit greyish in colour and slightly jaundiced. He had a convulsion that lasted for two minutes and responded well to 1 mg diazepam rectally. The doctor ordered a complete blood count and prescribed Ampiclox syrup to be given every eight hours. The next day, the baby's condition worsened. He was unable to suck, looked lethargic, and had a vacant look in his eyes and slight twitching. The midwife inserted a nasogastric tube and expressed breast milk was given every three hours. The doctor reviewed the baby during ward rounds and prescribed phenobarbitone 5mg/kg, given in 12 hourly doses. That evening, the baby suddenly stopped breathing and passed away.

Review the following questions and answer after completing the stillbirth and neonatal death form:

1. What was the most likely primary cause of death?
2. What potentially modifiable factors may have contributed to the death?
3. What missed opportunities for good care or instances of substandard care can you identify?
4. What changes to the action plan would you recommend to improve quality of care?

CASE STUDY 1: STILLBIRTH AND NEONATAL DEATH CASE REVIEW FORM

Section1: Identification					
1.1	ID# mother	XXX (Case 1)			
1.2	ID# baby	XXX			
1.3	Facility name XXXX				
1.4	Type of care available	**Comprehensive EmOC**	**√ Basic EmOC**	**First aid**	**Home delivery**
1.5	District name				
1.6	Referred	**√ Not referred**	**Referred in**		
			Referred out		

Section 2: Pregnancy progress and care								
2.1	Obstetric history							
		All pregnancies	All births	Total live births	Dead	Still-births	Neonatal deaths	Abortions
2.2	Mother's Age		17Y					
2.3	Type of pregnancy		Singleton√	Twin		Higher multiple		Unknown
2.4	Antenatal care number of visits		4 or more	3	2√	1	No visits	Unknown
Adjust as per local context								
2.5	Malaria prophylaxis							
	Not needed		IPT3+√	IPT2	IPT1	Not received		Unknown
2.6	Tetanus toxoid vaccination		TT2+√		TT1	Not received		Unknown
2.7	HIV status		HIV-negative	HIV-positive		Not done		Unknown√
	2.7.1 HIV-positive action			NVP	HAART	Other, specify		
2.8	Syphilis test		Syphilis-negative	Syphilis-positive		Not done		Unknown√

Section 3: Labour and birth								
3.1	Mother's LMP	DD	MM	YY	Unknown√			
3.2	Date of birth	DD	YY	YY				
	3.2.1 Time of birth	h						
3.3	Gestational age			20 weeks	Unknown			
	3.3.1 Method of determination		Sure LMP dates		Unsure LMP dates√		Other, specify	
			Early ultrasound		Late ultrasound			
3.4	Place of delivery			Facility√	Home	Road	Other, specify	Unknown
	3.4.1 Attendant at delivery	Midwife√	Nurse	Doctor	Other, specify		No one	Unknown
3.5	Onset of labour			Spontaneous √	Induced	C/S before onset		Unknown
3.6	Foetal heart sounds on admission			No	Yes√			Unknown
3.7	Partograph used			No	Yes√			Unknown
3.8	Mode of delivery			CVD√	Assisted vaginal	Caesarean	Other, specify	Unknown
3.9	Time between decision for action and birth		n/a	<30 mins	30–60 mins	>60 mins √		Unknown
3.10	Apgar score		1 min =	4 or more	3 or less√			Unknown
			5 min =	4 or more√	3 or less			
3.11	Resuscitation			Bag + mask	Not done √	Other, specify not available		Unknown
3.12	Sex of baby		Male	Female				Unknown
3.13	Birth weight		g	≥2500g√	1500–2499g	1000–1499g	<1000g	Unknown
					LBW	VLBW	ELBW	

Section 4: Details of the death												
4.1	Date of death	DD	MM	YY	4.2 Type of death (tick one)							
	4.1.1 Time of death	: 72 H			Neonatal death√	Intrapartum stillbirth	Antepartum stillbirth	Stillbirth unknown timing				
4.2	Enter the perinatal cause of death as per ICD-10 PM to the corresponding box				N5							
4.3	Main maternal condition	None identified			Main maternal condition followed by the corresponding number. Use the reference below to write in the corresponding number. Include more than one if applicable.						Unknown	
4.4	Cause of death (circle one)				**M1**	**M2**	**M3**	**M4**	**M5**	**Other**	**Unknown**	
	a. Congenital											
	b. Antepartum complication											
	c. Intrapartum complication											
	d. Complication of prematurity											
	e. Infection	Tetanus	Sepsis	Pneumonia	Meningitis							
		Syphilis	Diarrhoea	Other specify, if known								
	f. Other, specify Convulsion, sepsis						√					
	g. Unknown/unspecified											

Section 5: Critical delays and modifiable factors			
5.1	Critical delays	Delay 1: Not identified	1. Delay recognising need of care
		Delay 2: Not identified	2. Delay seeking care
		Delay 3: Not identified	3. Delay receiving care
5.2	Modifiable factors		
	Family related	None identified	Specify
	Late/no antenatal care; cultural inhibition to seeking care; no knowledge of danger signs; financial constraints; partner restricts care-seeking; use of traditional/herbal medicine; smoking/drug or alcohol abuse; attempted termination; etc.		
	Administration related	None identified	Specify
	Neonatal facilities; theatre facilities; resuscitation equipment; blood products; lack of training; insufficient staff numbers; anaesthetic delay; no antenatal documentation; etc.		Lack of trained human resources Lack of resuscitation equipment Lack of neonatal facilities
	Provider related	None identified	Specify
	Partograph/labour care guide not used; action not taken; inappropriate action taken; iatrogenic delivery; delay in referral; inadequate monitoring; delay in calling for assistance; inappropriate discharge; etc.		Partograph used but not interpreted well Inadequate monitoring of mother and baby Syrup was given as medication instead of IV
	Other	None identified	Specify
Actions to address the critical delays and modifiable factors:			
Trained human resources or capacity-building of the existing staff, equipment to be kept and checked regularly. Neonatal service need to be updated.			
Form completed by Dr. Shailee Karim		Date 2.16.2021	
c/s: caesarean section; CVD: cephalic vaginal delivery; ELBW: extremely low birth weight; EmOC: emergency obstetric care; HAART: highly active antiretroviral therapy; HIV: human immunodeficiency virus; IPT: intermittent preventive treatment; LBW: low birth weight; LMP: last menstrual period; NVP: nevirapine prophylaxis; TT: tetanus toxoid; VLBW: very low birth weight			

Source: World Health Organization. 2016. Making Every Baby Count: Audit and review of stillbirths and neonatal deaths.

After a week, the case was reviewed at the perinatal death review meeting.

1. What was the most likely primary cause of death?

Causes of death	Clinical details	ICD-10 PM
a) Main disease or condition in foetus or infant	Convulsion	**N5, M3**
b) Other diseases of conditions in foetus or infant	Sepsis, jaundice	
c) Main maternal disease or condition affecting foetus or infant	Prolonged labour	
d) Other maternal diseases or conditions affecting foetus or infant		

Source: ICD-10 PM

2. What potentially modifiable factors may have contributed to the death?

PROVIDER-RELATED MODIFIABLE FACTORS:

- Lack of proper ANC care (did not examine or even inspect for the complaint of foul-smelling discharge)
- Meconium staining identified at 6 cm dilation but no action taken
- Prolonged labour
- Doctor called but infant was not admitted to neonatal unit/care or referred
- Ordered to record temperature every six hours but recorded twice a day
- Infant needed an injectable antibiotic but given syrup
- No early referral made to a higher-level facility

ADMINISTRATION-RELATED MODIFIABLE FACTORS:

- No Ambu bag and mask in the labour room
- Lack of trained and experienced human resources

3. What missed opportunities for good care or instances of substandard care can you identify?

- Proper ANC, including counselling
- Mismanagement of labour (partograph/labour care guide maintained but no action taken despite meconium staining at 6 cm dilation and prolonged labour)
- No proper neonatal care
- Lack of necessary equipment: no Ambu bag
- Lack of trained human resources

4. What changes to the action plan would you recommend to improve quality of care?

- Work on the identified modifiable contributory factors and make a response plan
- Improve ANC and intrapartum care; ensure trained human resources; check emergency equipment
- Implement the plan and review periodically

CASE STUDY 2: ANTEPARTUM STILLBIRTH

Aisha Tukur is 21-year-old gravida 5, para 2+2. Her last two pregnancies ended in miscarriage. At 16 weeks' gestation, Aisha started ANC at the nearest community health centre (CHC), which was one hour away by minibus. At the booking visit, the midwife took her full history and filled in a card, measured her weight and blood pressure, palpated her abdomen, listened to the heart sounds of the foetus, and told her everything was fine with her and the child. She gave her a tetanus injection, prescribed iron and folic acid tablets, and gave her three antimalarial tablets to take at the clinic. Aisha was then sent to the laboratory for testing of Hb, urine for glucose and albumin and VDRL testing. Her Hb was 11gram/dl. The results of the VDRL test would only be available at the next ANC visit. After four weeks, Aisha went back to the clinic. The village health worker who received her checked her weight and blood pressure and recorded the findings on her antenatal card. He also checked the register for the results of the VDRL test, which was ++, and recoded the findings on the card.

Next Aisha was referred to the nurse/midwife, who examined her and told her everything was fine. She was counselled on danger signs of pregnancy and birth and emergency preparedness. She got her second dose of Fansidar (sulphadoxine and pyrimethamine) and was given iron/folic acid tablets for four weeks. At 34 weeks, she noticed a decrease in foetal movements. She went to the CHC but was told by the village health worker to come back in three days because on that day there was no antenatal clinic, only an immunisation clinic. Disappointed and worried about the condition of the child, she returned home.

Three days later, her husband was not around so she had no money for transport and had to wait until the next week to go to the antenatal clinic. When she finally went back to the antenatal clinic, she had not felt foetal movements for three days. The midwife examined her and could not hear the foetal heart. She was given a referral letter to the general hospital, which was three hours away by bus. She cried, went home, and told her husband. The next day, they went to the hospital together. Aisha was examined by the midwife, who also could not hear the foetal heart, even with the Sonicaid (foetal Doppler/ultrasound). She was referred to the doctor, who confirmed the intrauterine death. After admission, labour was induced with an IV drip with 2 U oxytocin, which was gradually increased every half hour. After two infusions, she delivered a macerated stillbirth, with a weight of 2.2 kg. The placenta looked abnormal and was bulky. Blood loss was 250 ml. Some tests were carried out in the hospital and she received two injections before discharge.

Review the following questions and answer after completing the stillbirth and neonatal death form:

1. What was the most likely primary cause of death?
2. What potentially modifiable factors may have contributed to the death?
3. What missed opportunities for good care or instances of substandard care can you identify?
4. What changes to the action plan would you recommend to improve quality of care?

CASE STUDY 2: STILLBIRTH AND NEONATAL DEATH CASE REVIEW FORM

Section1: Identification					
1.1	ID# mother	XXXX (Case 2)			
1.2	ID# baby	XXXX			
1.3	Facility name XXXXXX				
1.4	Type of care available	**Comprehensive EmOC √**	**Basic EmOC**	**First aid**	**Home delivery**
1.5	District name				
1.6	Referred	**Not referred**	**Referred in √**		
			Referred out		

Section 2: Pregnancy progress and care								
2.1	Obstetric history			2				2
		All pregnancies	All births	Total live births	Dead	Still-births	Neonatal deaths	Abortions
2.2	Mother's Age		21Y					
2.3	Type of pregnancy		Singleton√	Twin		Higher multiple		Unknown
2.4	Antenatal care number of visits		4 or more	3√	2	1	No visits	Unknown
Adjust as per local context								
2.5	Malaria prophylaxis							
	Not needed		IPT3+	IPT2√	IPT1		Not received	Unknown
2.6	Tetanus toxoid vaccination		TT2+		TT1√		Not done	Unknown
2.7	HIV status		HIV-negative	HIV-positive			Not tested	Unknown√
	2.7.1 HIV-positive action			NVP	HAART		Other, specify	
2.8	Syphilis test		Syphilis-negative	Syphilis-positive√			Not done	Unknown

Section 3: Labour and birth								
3.1	Mother's LMP	DD	MM	YY	Unknown√			
3.2	Date of birth	DD	YY	YY				
	3.2.1 Time of birth	h						
3.3	Gestational age			34 weeks	Unknown			
	3.3.1 Method of determination		Sure LMP dates		Unsure LMP dates		Other, specify √ palpation	
			Early ultrasound		Late ultrasound			
3.4	Place of delivery			Facility√	Home	Road	Other, specify	Unknown
	3.4.1 Attendant at delivery	Midwife	Nurse	Doctor√	Other, specify		No one	Unknown
3.5	Onset of labour			Spontaneous	Induced √	C/S before onset		Unknown
3.6	Foetal heart sounds on admission			No	Yes√			Unknown
3.7	Partograph used			No√	Yes			Unknown
3.8	Mode of delivery			CVD√	Assisted vaginal	Caesarean	Other, specify	Unknown
3.9	Time between decision for action and birth	n/a		<30 mins	30–60 mins	>60 mins √		Unknown
3.10	Apgar score	1 min =		4 or more	3 or less			Unknown
		5 min =		4 or more	3 or less			
3.11	Resuscitation	**Not needed √**		Bag + mask	Not done √	Other, specify stillbirth		Unknown
3.12	Sex of baby	Male		Female	√			Unknown
3.13	Birth weight	g		≥2500g	1500–2499g	1000–1499g	<1000g	Unknown
					LBW	VLBW	ELBW	

Section 4: Details of the death								
4.1	Date of death	DD	MM	YY	4.2 Type of death (tick one)			
	4.1.1 Time of death	: H			Neonatal death	Intrapartum stillbirth	Antepartum stillbirth √	Stillbirth unknown timing
4.2	Enter the perinatal cause of death as per ICD-10 PM to the corresponding box						**A2**	
4.3	Main maternal condition				Main maternal condition followed by the corresponding number. Use the reference below to write in the corresponding number. Include more than one if applicable.			Unknown

4.4	Cause of death (circle one)					M1	M2	M3	M4	M5	Other	Unknown
	a. Congenital											
	b. Antepartum complication								√			
	c. Intrapartum complication											
	d. Complication of prematurity											
	e. Infection	Tetanus	Sepsis	Pneumonia	Meningitis							
		Syphilis√	Diarrhoea	Other, specify if known								
	f. Other, specify intrauterine hypoxia											
	g. Unknown/unspecified											

Section 5: Critical delays and modifiable factors			
5.1	Critical delays	Delay 1: Not identified	1. Delay recognising need of care√
		Delay 2: Not identified	2. Delay seeking care√
		Delay 3: Not identified	3. Delay receiving care√
5.2	Modifiable factors		
	Family related	None identified	Specify
	Late/no antenatal care; cultural inhibition to seeking care; no knowledge of danger signs; financial constraints; partner restricts care-seeking; use of traditional/herbal medicine; smoking/drug or alcohol abuse; attempted termination; etc.		Delay in going to the center after being referred as heart sound was not heard
	Administration related	None identified	Specify
	Neonatal facilities; theatre facilities; resuscitation equipment; blood products; lack of training; insufficient staff numbers; anaesthetic delay; no antenatal documentation; etc.		Late Lab reporting (VDRL) Lack of trained human resource
	Provider related	None identified	Specify
	Partograph/labour care guide not used; action not taken; inappropriate action taken; iatrogenic delivery; delay in referral; inadequate monitoring; delay in calling for assistance; inappropriate discharge; etc.		Not given treatment or referred for VDRL positive Not given ANC care or even counselling in emergency situation and sent back home as there was immunization clinic going on Delay in identification treatment or referral for VDRL-positive
	Other	None identified	Specify
Actions to address the critical delays and modifiable factors:			
Provision for early reporting and providing investigation report, making available of ANC service every day, develop trained human resource or capacity-building. Orientation to the staff of OPD for counselling about conditions like VDRL-positive to the patient			
Form completed by Dr Shyama Karna		Date 2.16.2021	
c/s: caesarean section; CVD: cephalic vaginal delivery; ELBW: extremely low birth weight; EmOC: emergency obstetric care; HAART: highly active antiretroviral therapy; HIV: human immunodeficiency virus; IPT: intermittent preventive treatment; LBW: low birth weight; LMP: last menstrual period; NVP: nevirapine prophylaxis; TT: tetanus toxoid; VLBW: very low birth weight			

Source: World Health Organization. 2016. Making Every Baby Count: Audit and review of stillbirths and neonatal deaths

The case was reviewed at the next perinatal death review meeting, where the following questions were addressed.

1. What was the most likely primary cause of death?

Causes of death	Clinical details	ICD-10 PM
a) Main disease or condition in foetus or infant	Antepartum Infection	**A2, M4**
b) Other diseases of conditions in foetus or infant		
c) Main maternal disease or condition affecting foetus or infant	Placenta looked abnormal and was bulky	
d) Other maternal diseases or conditions affecting foetus or infant	VDRL++	

Source: ICD-10 PM

2. What potentially modifiable factors may have contributed to the death?

FAMILY-RELATED MODIFIABLE FACTORS:

- Husband was not around so the woman had no money for transport and had to wait until the next week

ADMINISTRATION-RELATED MODIFIABLE FACTORS:

- Technical issues around lab investigation (delay in reporting)
- Lack of regular ANC: No emergency ANC despite decreased foetal movement at 34 weeks, and on the day the women returned for care only an immunisation clinic was scheduled
- Lack of trained human resources
- Referral: late

PROVIDER-RELATED MODIFIABLE FACTORS:

- Treatment for VDRL++: Diagnosed, reported four weeks later but still no treatment
- No ANC check-up given despite decreased foetal movement at 34 weeks, which should have been treated as an emergency

3. What missed opportunities for good care or instances of substandard care can you identify?

- Lab: Late reporting
- No treatment or referral for VDRL++ test
- No regular ANC
- No counselling was provided, even to refer the woman to another site, as this was emergency.
- When the woman returned to the clinic because of decreased foetal movement, she was asked to follow up in three days, which was not appropriate care for a pregnant woman who was dependent on her husband for money.

4. What changes to the action plan would you recommend to improve quality of care?
    - Lab: Early reporting of test results (in this case, the VDRL report was provided 4 weeks after)
    - Trained human resources: The village health workers/midwives who provide care to pregnant women need to be trained to advise/refer or treat conditions such as VDRL+; or, if the health care provider is trained, they should receive feedback to prevent future occurrences
    - Regular ANC check-ups with trained human resources to identify problems
    - Early referral to higher-level centres for management instead of asking clients to return later

CASE STUDY 3: INTRAPARTUM STILLBIRTH

Funmi Okintade is a 17-year-old schoolgirl who accidentally became pregnant from her boyfriend, Mussah, a classmate. They had been having occasional sex for three months but never used contraceptives. When the pregnancy became obvious, Funmi was expelled from school. Her father was angry and told her she had brought shame on the family. To hide the situation, Funmi was sent to her grandmother in her mother's native village.

Funmi helped her grandmother in the garden and with household chores but did not go to the antenatal clinic because she felt embarrassed. Her feet gradually became swollen and later even her fingers. When she was 32 weeks pregnant, her grandmother took her to the nearby maternal and child health (MCH) clinic, where she was seen by the midwife at the antenatal clinic. The female health extension worker was not very nice to her and condemned her pregnancy as a result of her immoral behaviour. Apart from an elevated blood pressure of 130/90, nothing abnormal was found. No laboratory tests were conducted since the MCH had neither a laboratory nor dipsticks to test her urine. Funmi was advised to rest at home and come back after a week.

However, Funmi decided not to go back to the antenatal clinic because she did not like the judgemental attitude of the health extension worker and her moralistic talk.

When she was 36 weeks pregnant, she had sudden abdominal pain, which persisted. Later the same day, she started bleeding and felt weak. Her grandmother called the local traditional birth attendant (TBA), who examined her and told her something was wrong with the pregnancy and that she had to go to the hospital. Her grandmother took her in a minibus to the hospital in town, which was one hour away. On admission, Funmi was examined by the midwife in the maternity ward. Her pulse rate was 100/min, BP was 160/110, and temperature was 37°C. She looked slightly pale and had oedema of the hands and feet. Her face also looked slightly puffy. The fundus was at term, the uterus felt hard, and the foetus was difficult to palpate but was in cephalic presentation. The foetal heart rate was 120/min. There was slight vaginal bleeding. The cervix was soft and closed. She was admitted and reviewed by the doctor, who prescribed an injection of 5 grams magnesium sulphate in each buttock and an IV injection of 5 mg hydralazine, which was repeated after four hours. Later that day, the BP had gone down to 130/90. Her condition remained stable. In her patient notes, no information on the foetal heart rate had been recorded since admission. The afternoon of the next day, she went into labour, and at 11 pm she delivered a fresh female stillbirth weighing 2.5 kg. The placenta was delivered by controlled cord traction 15 minutes after delivery of the foetus, together with a large blood clot. Total blood loss was estimated at 500 ml. Magnesium sulphate was continued until 24 hours after delivery. The oedema gradually subsided and the BP returned to normal. Three days after delivery, Funmi was discharged in good condition.

Review the following questions and answer after completing the stillbirth and neonatal death form:

1. What was the most likely primary cause of death?
2. What potentially modifiable factors may have contributed to the death?
3. What missed opportunities for good care or instances of substandard care can you identify?
4. What changes to the action plan would you recommend to improve quality of care?

CASE 3: STILLBIRTH AND NEONATAL DEATH CASE REVIEW FORM

Section1: Identification					
1.1	ID# mother	XXX (Case 3)			
1.2	ID# baby	XXX			
1.3	Facility name XXX				
1.4	Type of care available	**Comprehensive EmOC√**	**Basic EmOC**	**First aid**	**Home delivery**
1.5	District name				
1.6	Referred	**Not referred**	**Referred in√**		
			Referred out		

Section 2: Pregnancy progress and care									
2.1	Obstetric history								
		All pregnancies	All births	Total live births		Dead	Still-births	Neonatal deaths	Abortions
2.2	Mother's Age		17Y						
2.3	Type of pregnancy		Singleton√	Twin		Higher multiple			Unknown
2.4	Antenatal care number of visits		4 or more	3	2	1√	No visits		Unknown
Adjust as per local context									
2.5	Malaria prophylaxis								
	Not needed		IPT3+	IPT2	IPT1		Not received		Unknown√
2.6	Tetanus toxoid vaccination		TT2+		TT1		Not received		Unknown√
2.7	HIV status		HIV-negative	HIV-positive			Not done		Unknown√
	2.7.1 HIV-positive action			NVP	HAART		Other, specify		
2.8	Syphilis test		Syphilis-negative	Syphilis-positive			Not done		Unknown√

Section 3: Labour and birth								
3.1	Mother's LMP	DD	MM	YY	Unknown√			
3.2	Date of birth	DD	YY	YY				
	3.2.1 Time of birth	h						
3.3	Gestational age			20 weeks	Unknown			
	3.3.1 Method of determination		Sure LMP dates		Unsure LMP dates√		Other, specify	
			Early ultrasound		Late ultrasound			
3.4	Place of delivery			Facility√	Home	Road	Other, specify	Unknown
	3.4.1 Attendant at delivery	Midwife√	Nurse	Doctor	Other, specify		No one	Unknown
3.5	Onset of labour			Spontaneous √	Induced	C/S before onset		Unknown
3.6	Foetal heart sounds on admission			No	Yes√			Unknown
3.7	Partograph used			No	Yes			Unknown
3.8	Mode of delivery			CVD√	Assisted vaginal	Caesarean	Other, specify	Unknown
3.9	Time between decision for action and birth		n/a	<30 mins	30–60 mins	>60 mins		Unknown
3.10	Apgar score		1 min =	4 or more	3 or less			Unknown
			5 min =	4 or more	3 or less			
3.11	Resuscitation	**Not needed√**		Bag + mask	Not done	Other, specify not available		Unknown
3.12	Sex of baby		Male	Female				Unknown
3.13	Birth weight		g	≥2500g√	1500–2499g	1000–1499g	<1000g	Unknown
					LBW	VLBW	ELBW	

Section 4: Details of the death									
4.1	Date of death	DD	MM	YY	4.2 Type of death (tick one)				
	4.1.1 Time of death	:	H		Neonatal death	Intrapartum stillbirth√	Antepartum stillbirth	Stillbirth unknown timing	
4.2	Enter the perinatal cause of death as per ICD-10 PM to the corresponding box					I 3			
4.3	Main maternal condition	None identified			Main maternal condition followed by the corresponding number. Use the reference below to write in the corresponding number. Include more than one if applicable.				Unknown
4.4	Cause of death(circle one)				**M1**	**M2**	**M3**	**M4**	**M5**	**Other**	**Unknown**
	a. Congenital										
	b. Antepartum complication										
	c. Intrapartum complication				√						
	d. Complication of prematurity										
	e. Infection	Tetanus	Sepsis	Pneumonia	Meningitis						
		Syphilis	Diarrhoea	Other (specify, if known)							
	f. Other, specify Hypoxia, abruption of the placenta, severe PE										
	g. Unknown/unspecified										

Section 5: Critical delays and modifiable factors			
5.1	Critical delays	Delay 1: Not identified	1. Delay recognising need of care√
		Delay 2: Not identified	2. Delay seeking care√
		Delay 3: Not identified	3. Delay receiving care√
5.2	Modifiable factors		
	Family related	None identified	Specify
	Late/no antenatal care; cultural inhibition to seeking care; no knowledge of danger signs; financial constraints; partner restricts care-seeking; use of traditional/herbal medicine; smoking/drug or alcohol abuse; attempted termination; etc.		Lack of support from family, school
	Administration related	None identified	Specify
	Neonatal facilities; theatre facilities; resuscitation equipment; blood products; lack of training; insufficient staff numbers; anaesthetic delay; no antenatal documentation; etc.		Lack of provision of care for adolescent pregnancy Lack of triaging at antenatal care Lack of trained human resources No lab facility or even dipstick
	Provider related	None identified	Specify
	Partograph/labour care guide not used; action not taken; inappropriate action taken; iatrogenic delivery; delay in referral; inadequate monitoring; delay in calling for assistance; inappropriate discharge; etc.		Lack of respectful maternity care Lack of counselling despite increased blood pressure No recording of foetal heat No information recorded
	Other	None identified	Specify
Actions to address the critical delays and modifiable factors:			
Advocate for adolescent clinic, provide respectful maternity care with counselling at each visit			
Basic lab facility, trained human resources or capacity-building, make recording of procedures compulsory			
Form completed by Shenaz Dole		Date 2.16.2021	
c/s: caesarean section; CVD: cephalic vaginal delivery; ELBW: extremely low birth weight; EmOC: emergency obstetric care; HAART: highly active antiretroviral therapy; HIV: human immunodeficiency virus; IPT: intermittent preventive treatment; LBW: low birth weight; LMP: last menstrual period; NVP: nevirapine prophylaxis; TT: tetanus toxoid; VLBW: very low birth weight			

Source: World Health Organization. 2016. Making Every Baby Count: Audit and review of stillbirths and neonatal deaths.

The case was reviewed at the next perinatal death review meeting and the following questions were addressed.

1. What was the most likely primary cause of death?

Causes of death	Clinical details	ICD-10 PM
a) Main disease or condition in foetus or infant	Intrauterine hypoxia	**I3, M1**
b) Other diseases of conditions in foetus or infant		
c) Main maternal disease or condition affecting foetus or infant	Abruptio placenta	
d) Other maternal diseases or conditions affecting foetus or infant	Pre-eclampsia	

Source: ICD-10 PM

2. What potentially modifiable factors may have contributed to the death?

FAMILY-RELATED MODIFIABLE FACTORS:

- She is an adolescent and pregnant with lack of family support.
- Expelled from school
- It took one hour to travel by bus to the health centre.

ADMINISTRATION-RELATED MODIFIABLE FACTORS:

- Lack of adolescent-friendly clinic
- Lack of respectful maternity care at the health facility
- Lack of triage during ANC visit: Adolescent pregnancies should be given priority for confidentiality and ANC
- No lab facility, no dipstick for urine testing

PROVIDER-RELATED MODIFIABLE FACTORS:

- Lack of respectful maternity care
- Due to the abusive attitude at the facility, the pregnant adolescent did not visit the facility and was seen by a TBA at home even though she needed immediate hospital admission
- Lack of counselling during ANC
- No proper antepartum care: No foetal heart rate was taken and antepartum haemorrhage was not identified

3. What missed opportunities for good care or instances of substandard care can you identify?
    - Lack of respectful maternity care
    - Lack of proper ANC: No triage, no proper counselling for increased blood pressure
    - Abusive attitude at the health centre
    - Lack of lab facility or even dipsticks for urine testing
    - Lack of proper antepartum and intrapartum care: Foetal heart rate was not taken, the contraction and vaginal bleeding were not identified as possibly due to antepartum haemorrhage (abruptio placenta)

4. What changes to the action plan would you recommend to improve quality of care?
    - Share feedback from the perinatal death review with the concerned health worker and ensure it is implemented by all
    - Include advocacy for pregnant adolescents and care at home and the health centre
    - Provide respectful maternity care with triage at registration to ensure prompt care for pregnant adolescents
    - Ensure facilities have dipsticks to test urine for albumin even if there is no lab facility
    - Provide proper ANC with counselling
    - Ensure trained human resources

CASE STUDY 4: BIRTH ASPHYXIA/MODERATELY PRETERM BABY

Nura Abubakar, who is married to Ishmael Mohammed, is 21 years and gravida 2, para 1. At 20 weeks' gestation she started attending the antenatal clinic at the nearby MCH clinic. No abnormalities were found. At 28 and 32 weeks, she attended the ANC clinic again. At gestation 33 weeks, her membranes ruptured and she started draining liquid, but there were no contractions. She realised that the foetus was still quite small to be born. When her husband came home from work at 4 pm, she informed him and the next day he arranged transport and took her to the general hospital.

At the hospital, she was admitted to the maternity area with a diagnosis of threatened premature labour and put on complete bed rest, with vital signs, contractions, and foetal heart rate monitored every four hours. The draining of liquid diminished, but after four days she had slight contractions. She was prescribed a salbutamol intravenous infusion of 10 mg/1 litre normal saline, but she still went into labour the next day. During admission, her vital signs and the foetal heart rate were only recorded every 12 hours. On the day she went into labour, a temperature of 38°C was recorded in the morning. At 3 pm, Nura gave birth to a premature male infant of 1.8 kg with an Apgar score of 6 after one minute and 9 after five minutes. The cord was clamped after three minutes. The baby was wiped dry and wrapped in a cloth, received 1 mg vitamin K1 intramuscularly, and was put on the mother's chest. After Nura received 10 units of oxytocin, the placenta was delivered by controlled cord traction.

The baby was treated with kangaroo mother care and initially did well apart from occasional apnoea attacks, which responded well to tactile stimulation. However, by the second day, the baby developed more severe breathing difficulties, had an increased respiration rate of 60/min, had chest-indrawing, and looked slightly cyanotic. The newborn was unable to suck and was put on nasogastric tube feedings of expressed breast milk every three hours and received ampicillin 100 mg BD (twice a day) and gentamicin 5 mg OD (once daily). Unfortunately, the maternity had run out of oxygen cylinders, so oxygen could not be given. The baby stopped breathing that night.

Review the following questions and answer after completing the stillbirth and neonatal death form:

1. What was the most likely primary cause of death?
2. What potentially modifiable factors may have contributed to the death?
3. What missed opportunities for good care or instances of substandard care can you identify?
4. What changes to the action plan would you recommend to improve quality of care?

CASE 4: STILLBIRTH AND NEONATAL DEATH CASE REVIEW FORM

Section1: Identification					
1.1	ID# mother	XXX (Case 4)			
1.2	ID# baby	XXX			
1.3	Facility name XXX				
1.4	Type of care available	**Comprehensive EmOC**	**Basic EmOC**√	**First aid**	**Home delivery**
1.5	District name				
1.6	Referred	**Not referred**√	**Referred in**		
			Referred out		

Section 2: Pregnancy progress and care								
2.1	Obstetric history			1				
		All pregnancies	All births	Total live births	Dead	Still-births	Neonatal deaths	Abortions
2.2	Mother's Age		21Y					
2.3	Type of pregnancy		Singleton√	Twin		Higher multiple		Unknown
2.4	Antenatal care number of visits		4 or more	3√	2	1	No visits	Unknown
Adjust as per local context								
2.5	Malaria prophylaxis							
	Not needed		IPT3+	IPT2	IPT1	Not received		Unknown√
2.6	Tetanus toxoid vaccination		TT2+		TT1	Not received		Unknown√
2.7	HIV status		HIV-negative	HIV-positive		Not done		Unknown√
	2.7.1 HIV-positive action			NVP	HAART	Other, specify		
2.8	Syphilis test		Syphilis-negative	Syphilis-positive		Not done		Unknown√

Section 3: Labour and birth								
3.1	Mother's LMP	DD	MM	YY	Unknown√			
3.2	Date of birth	DD	YY	YY				
	3.2.1 Time of birth	h						
3.3	Gestational age			33 weeks	Unknown			
	3.3.1 Method of determination		Sure LMP dates		Unsure LMP dates√		Other, specify	
			Early ultrasound		Late ultrasound			
3.4	Place of delivery			Facility√	Home	Road	Other, specify	Unknown
	3.4.1 Attendant at delivery	Midwife	Nurse	Doctor	Other, specify		No one	Unknown√
3.5	Onset of labour			Spontaneous √	Induced	C/S before onset		Unknown
3.6	Foetal heart sounds on admission			No	Yes			Unknown√
3.7	Partograph used			No	Yes			Unknown
3.8	Mode of delivery			CVD√	Assisted vaginal	Caesarean	Other, specify	Unknown
3.9	Time between decision for action and birth		n/a	<30 mins	30–60 mins	>60 mins		Unknown
3.10	Apgar score		1 min =	4 or more√	3 or less			Unknown
			5 min =	4 or more√	3 or less			
3.11	Resuscitation	**Not needed**		Bag + mask	Not done	Other, specify not available		Unknown
3.12	Sex of baby		Male	Female				Unknown
3.13	Birth weight		g	≥2500g	1500–2499g√	1000–1499g	<1000g	Unknown
					LBW	VLBW	ELBW	

Section 4: Details of the death												
4.1	Date of death	DD	MM	YY	4.2 Type of death (tick one)							
	4.1.1 Time of death	3 PM : H			Neonatal death√	Intrapartum stillbirth	Antepartum stillbirth	Stillbirth unknown timing				
4.2	Enter the perinatal cause of death as per ICD-10 PM to the corresponding box				N 7							
4.3	Main maternal condition	None identified			Main maternal condition followed by the corresponding number. Use the reference below to write in the corresponding number. Include more than one if applicable.							Unknown
4.4	Cause of death (circle one)				**M1**	**M2**	**M3**	**M4**	**M5**	**Other**	**Unknown**	
	a. Congenital											
	b. Antepartum complication											
	c. Intrapartum complication											
	d. Complication of prematurity				√							
	e. Infection	Tetanus	Sepsis	Pneumonia	Meningitis							
		Syphilis	Diarrhoea	Other, specify if known								
	f. Other, specify Respiratory distress											
	g. Unknown/unspecified											

Section 5: Critical delays and modifiable factors			
5.1	Critical delays	Delay 1: Not identified	1. Delay recognising need of care✓
		Delay 2: Not identified	2. Delay seeking care
		Delay 3: Not identified	3. Delay receiving care✓
5.2	Modifiable factors		
	Family related	None identified	Specify
	Late/no antenatal care; cultural inhibition to seeking care; no knowledge of danger signs; financial constraints; partner restricts care-seeking; use of traditional/herbal medicine; smoking/drug or alcohol abuse; attempted termination; etc.		Lack of knowledge of the importance of going to the hospital after rupture of membrane; delay in going to hospital
	Administration related	None identified	Specify
	Neonatal facilities; theatre facilities; resuscitation equipment; blood products; lack of training; insufficient staff numbers; anaesthetic delay; no antenatal documentation; etc.		Lack of oxygen Lack of good neonatal care
	Provider related	None identified	Specify
	Partograph/labour care guide not used; action not taken; inappropriate action taken; iatrogenic delivery; delay in referral; inadequate monitoring; delay in calling for assistance; inappropriate discharge; etc.		Missed taking history of leaking and proper treatment No antibiotic and injection dexamethasone Lack of oxygen: did not check the supplies Intubation needed not done
	Other	None identified	Specify
Actions to address the critical delays and modifiable factors:			
Counselling needs to be improved and must be provided at every visit, trained human resources or capacity-building of the existing staff.			
Oxygen and emergency supplies should be checked and kept in continuous supply; neonatal care should be upgraded			
Form completed by Shenaz Dole		Date 2.16.2021	
c/s: caesarean section; CVD: cephalic vaginal delivery; ELBW: extremely low birth weight; EmOC: emergency obstetric care; HAART: highly active antiretroviral therapy; HIV: human immunodeficiency virus; IPT: intermittent preventive treatment; LBW: low birth weight; LMP: last menstrual period; NVP: nevirapine prophylaxis; TT: tetanus toxoid; VLBW: very low birth weight			

Source: World Health Organization. 2016. Making Every Baby Count: Audit and review of stillbirths and neonatal deaths.

The case was reviewed at the next perinatal death review meeting and the following questions were addressed.

1. What was the most likely primary cause of death?

Causes of death	Clinical details	ICD-10 PM
a) Main disease or condition in foetus or infant	Respiratory distress	**N7, M1**
b) Other diseases of conditions in foetus or infant	Prematurity	
c) Main maternal disease or condition affecting foetus or infant	Chorioamnionitis (intrapartum fever)	
d) Other maternal diseases or conditions affecting foetus or infant	Premature rupture of membrane	

Source: ICD-10 PM

2. What potentially modifiable factors may have contributed to the death?

FAMILY-RELATED MODIFIABLE FACTORS:

- No knowledge of danger signs as the woman had leaking but stayed at home and her husband took her to the hospital the next day

ADMINISTRATION-RELATED MODIFIABLE FACTORS:

- Lack of oxygen for the baby
- Facility lacked a proper neonatal intensive care unit (NICU)

PROVIDER-RELATED MODIFIABLE FACTORS:

- Lack of counselling at ANC though she had three ANC visits, at 20, 28, and 32 weeks of gestation. The last was one week prior to the complaint of per vaginal leaking.
- Admitted for preterm labour, premature rupture of membrane not identified.
- Antepartum antibiotic was given to the mother though the leaking had been ongoing for more than 24 hours, and an antenatal steroid (dexamethasone or beclomethasone) was not given.
- Counselling not conducted on prematurity and need for NICU.
- Workup for ruling out chorioamnionitis was not done.

3. What missed opportunities for good care or instances of substandard care can you identify?

- Lack of counselling by the health worker about danger signs to report immediately to the health centre
- Missed identifying premature rupture of membrane even four days after she was admitted
- Screening for chorioamnionitis missed
- Antepartum antibiotic and steroid for lung maturity not given
- Counselling for premature delivery and need for NICU support not given
- Technical difficulty: Lack of oxygen

4. What changes to the action plan would you recommend to improve quality of care?
    - Provide proper ANC care with counselling on each visit
    - Ensure that a proper history is taken and examined
    - Establish a protocol for giving steroid for lung maturity
    - Ensure staff have appropriate training
    - Maintain a continuous supply of emergency instruments and medicine

ANNEX XV: EXERCISE A: CALCULATING PERCENTAGE OF MATERNAL DEATHS BY CAUSE

Complete rows H through L in the table below to calculate the proportion (%) of deaths by cause for each month.

	January	February	March	April	May	June
A. Total number of deliveries (including stillbirths)	713	644	589	630	558	540
B. Total number of maternal deaths	18	19	20	17	17	14
C. Deaths due to PPH	8	8	8	7	7	6
D. Deaths to PE/E	5	5	4	5	4	3
E. Deaths due to pregnancy-related infection	2	3	4	2	2	1
F. Deaths due to malaria complications	1	2	1	2	2	2
G. Deaths due to other causes	2	1	3	1	2	2
H. Proportion of deaths due to PPH *(row C divided by row B)*	44%	42%	40%	41%	41%	43%
I. Proportion of deaths due to PE/E *(row D divided by row B)*	28%	26%	20%	29%	24%	21%
J. Proportion of deaths due to infection *(Row E divided by Row B)*	11%	16%	20%	12%	12%	7%
K. Proportion of deaths due to malaria *(row F divided by row B)*	6%	11%	5%	12%	12%	14%
L. Proportion of deaths due to other causes *(row G divided by row B)*	11%	5%	15%	6%	12%	14%

What are the first and second leading causes of maternal deaths in your facility over the past six months?

- First leading cause of death: PPH
- Second leading cause of death: PE/E

ANNEX XVI A: [SAMPLE] MPDSR INDIVIDUAL DEATH REVIEW RESPONSE PLAN

MPDSR FORM: MODIFIABLE FACTORS (FAMILY RELATED, ADMINISTRATION RELATED, PROVIDER RELATED)

District:	Health facility:	Meeting date (MM/DD/YY): ___/___/___
Maternal death event date (MM/DD/YR):	Address of the deceased	
Place of death:	Date form completed (MM/DD/YY)	
Case summary *(can be pasted in, if completed during a previous meeting)*		

Modifiable contributing factors *(organised within the Three Delays Model)*	
First delay: Recognition and decision to seek care (home/family/community)	
Second delay: Transport to care, delays reaching an appropriate facility	
Third delay: Quality of care received in the health facility	

MPDSR PRIORITY RESPONSES TO IMPLEMENT AND MONITOR

Common modifiable contributing factors	Action (what to do)	Person responsible for completing action (specify facility and/or district)	Target completion date	Follow-up progress notes (completed/ongoing/failed)

ANNEX XVI B: EXERCISE B: RESPONSE REVIEW AND ANALYSIS

In the previous exercise, you determined that PPH is the current leading cause of maternal death in your facility. Given this finding, you decide to review the last eight response plans of deaths of women due to PPH in your facility. You want to understand if there are common modifiable factors where you can focus your efforts. Table 13 lists modifiable factors and responses identified in the death review response actions for deaths due to PPH for the last eight death reviews.

TABLE 13. SUMMARY OF MODIFIABLE FACTORS AND RECOMMENDED ACTIONS FROM AUDITS OF THE EIGHT MOST RECENT MATERNAL DEATHS DUE TO PPH

Number	Modifiable contributing factors (from past individual review of maternal deaths due to PPH)	Summary of prioritised responses
1	• No uterotonic for prevention and management of PPH in the labour ward • Provider did not know how to manage PPH	• Ensure availability of oxytocin in the labour ward 24/7 • Develop a log to track availability of oxytocin • Ensure that providers know how to manage uterine atony and other causes of PPH
2	• Immediate postpartum prophylactic uterotonic not administered (active management of the third stage of labour) • Woman not monitored for bleeding after delivery	• Ensure that all providers are competent and understand the importance of providing active management of the third stage of labour • Introduce a systematic written protocol, with assigned staff, to monitor all women for bleeding and other danger signs after birth
3	• Delayed identification of PPH in the postnatal ward • Lack of blood and/or blood products	• Ensure that providers conduct regular postnatal checks in the postnatal ward • Ensure that providers document regular postnatal checks in the client file • Ensure existence and implementation of log/system to monitor and document availability of blood and blood products • Ensure blood and blood products are always available and stored properly at the facility blood bank • Introduce a written communication protocol for maternity and blood bank staff to ensure immediate release of blood to the maternity ward in an emergency
4	• Delay in getting to the health facility due to lack of timely, affordable transportation	• Work with district and community leaders to establish a system for emergency transport of pregnant women with complications from the community to the hospital • Orient community health workers and health facility staff to the transportation system • Purchase ambulance to transport pregnant women from the community to the health facility

Number	Modifiable contributing factors (from past individual review of maternal deaths due to PPH)	Summary of prioritised responses
5	• Provider did not know how to manage PPH • Lack of blood and/or blood products	• Strengthen providers' skills to manage atonic uterus and other causes of PPH • Ensure the existence of a log/system to monitor and document availability of blood and blood products • Introduce team-based PPH simulation drills to strengthen coordination and performance of all relevant staff in an emergency (midwives, nurses, auxiliary assistants, doctors, laboratory technicians, pharmacists, housekeepers, etc.)
6	• Severe anaemia not diagnosed in pregnancy (no ANC screening of haemoglobin) • Iron and folate supplements not given • No packed cells available	• Post a written protocol for ANC screening and treatment of anaemia • Monitor availability and distribution of iron supplementation during ANC visits • Monitor anaemia screening and results as part of ANC visits • Ensure packed cells are always available and stored properly at the facility blood bank
7	• Delay in getting to the health facility due to lack of timely, affordable transportation • No triage protocol for rapid assessment and treatment of pregnant, labouring, and postnatal women • Skilled provider not available to triage women in the maternity	• Work with district and community leaders to establish a system for transportation of pregnant women from the community to the hospital • Review and revise maternity triage protocols; post the written protocol in the maternity area • Ensure a skilled provider is always available to triage women • Review delays in the usual patient pathway from arrival at the hospital gate to the maternity triage area and develop a written plan to address gaps and monitor
8	• Delayed identification of PPH in the postnatal ward • No uterotonic available in the postnatal ward	• Ensure that providers conduct regular postnatal checks in the postnatal ward • Ensure that providers document regular postnatal checks in the client file • Ensure availability of oxytocin in the postnatal ward 24/7 • Develop a log to track availability of oxytocin

SMALL GROUP DISCUSSION: REVIEW TABLE 13 AS A GROUP:

- What patterns do you see, if any, in the modifiable factors identified in the last eight audits of deaths of women due to PPH?
- What are the most important and common modifiable factors contributing to PPH that your team should prioritise?
- Based on these common modifiable factors and the recommended responses, discuss how your committee will prioritise aggregate responses to accelerate the reduction of deaths of women due to PPH in your facility.
- If time allows, begin to fill out the **Aggregate MPDSR Form** (Table 14) based on your prioritised responses. Be as specific as possible and be prepared to discuss in plenary.
- Table 14 may be a useful tool for MPDSR committees working to address common and persistent modifiable factors that have led to multiple deaths in previous months.

TABLE 14. AGGREGATE MPDSR FORM: COMMON MODIFIABLE FACTORS AND AGGREGATED RESPONSE PRIORITY TO ACCELERATE REDUCTION OF MATERNAL DEATHS DUE TO PPH (FAMILY RELATED, ADMINISTRATION RELATED, PROVIDER RELATED)

Common modifiable contributing factors	Action (what to do)	Person responsible for completing action (specify facility and/or district)	Target completion date	Follow-up progress notes (completed/ongoing/failed)

ANNEX XVII: EXERCISE C: VISUALISING TRENDS IN CAUSES OF MATERNAL DEATHS

Six months later you have implemented the priority responses you identified in Exercise B to address the key factors contributing to PPH deaths at your facility. To track your progress, you decide to review the causes of maternal deaths once again in your facility over the past six months. Table 15 presents the results of your data review. To visualise the changes over the past six months, **create a bar graph** that displays the monthly proportion of specific causes of maternal deaths from July to December 2017.

TABLE15. MONTHLY NUMBER OF MATERNAL DEATHS AND PROPORTION (%) OF DEATHS BY CAUSE (JULY–DECEMBER 2017)

	July	August	Sept	Oct	Nov	Dec
A. Total number of deliveries (including stillbirths)	713	558	690	589	570	651
B. Total number of maternal deaths	17	13	13	9	11	10
C. Deaths due to PPH	4	3	2	2	2	2
D. Deaths to PE/E	5	4	4	3	3	3
E. Deaths due to pregnancy-related infection	4	3	3	1	2	2
F. Deaths due to malaria complications	2	1	1	1	2	2
G. Deaths due to other causes	2	2	3	2	2	2
H. Proportion of deaths due to PPH *(row C divided by row B)*	24%	23%	15%	22%	18%	20%
I. Proportion of deaths due to PE/E *(row D divided by row B)*	29%	31%	31%	33%	27%	30%
J. Proportion of deaths due to infection *(Row E divided by Row B)*	24%	23%	23%	11%	18%	20%
K. Proportion of deaths due to malaria *(row F divided by row B)*	12%	8%	8%	11%	18%	20%
L. Proportion of deaths due to other causes *(row G divided by row B)*	12%	15%	23%	22%	18%	20%

EXERCISE C: BAR GRAPH DISPLAYING THE MONTHLY PROPORTION OF SPECIFIC CAUSES OF MATERNAL DEATHS FROM JULY TO DECEMBER 2017

1. Click inside the chart area.
2. Click "Edit Data."
3. You will get a chart with categories in the column and series in the row.
4. In place of categories, type months as January to December.
5. In place of series, type PPH, PE/E, infection, malaria, and other causes.
6. Enter the relevant percentages.

ANNEX XVIII: PERINATAL MORTALITY RATE DEFINITIONS AND DATA SOURCES

1. STILLBIRTH RATE

ANSWER KEY

For international comparison:

- **Numerator:** Number of babies born per year with no signs of life weighing ≥1,000 g and after 28 completed weeks of gestation
- **Denominator:** 1,000 total (live and stillborn) births

Data sources:

- Civil registration and vital statistics (CRVS) system
- Household surveys
- Health management information system (HMIS) and audit systems (often facility-based deaths only)
- Estimation models

2. NEONATAL MORTALITY RATE

ANSWER KEY

- **Numerator:** Number of live born infants per year who die before 28 completed days of life
- **Denominator:** 1,000 live births

Data sources:

- CRVS
- Household surveys
- HMIS and audit systems (often facility-based deaths only)
- Estimation models

3. PERINATAL MORTALITY RATE

ANSWER KEY (DEFINITIONS VARY)

- **Numerator:** Number of deaths among newborns weighing ≥1,000 g and after 28 completed weeks of gestation, plus neonatal deaths through the first seven completed days after birth
- **Denominator:** 1,000 total (live and stillborn) births

Data sources:

- CRVS
- Household surveys
- HMIS and audit systems (often facility-based deaths only)
- Estimation models

ANNEX XIX: CALCULATE AND ANALYSE PERINATAL MORTALITY INDICATOR

1. Stillbirth rate
2. Percentage of antepartum stillbirths
3. Early neonatal mortality rate
4. Perinatal mortality rate
5. Neonatal mortality rate
6. Maternal mortality ratio
7. Caesarean section rate (for all births)
8. Assisted delivery rate (for all births)
9. Low birthweight (live births)
10. Preterm rate (live births)

TABLE 16. DUMMY DATA FOR GROUP WORK: CALCULATING RATES

Serial No.	Indicator	Number
A	Number of deliveries	970
B	Number of births	1,000
C	Number of live births	980
D	Number of stillbirths	20
E	Number of intrapartum stillbirths	12
F	Number of antepartum stillbirths	8
G	Early neonatal deaths (1–7 days)	14
H	Neonatal deaths (1–28 days)	18
I	Maternal deaths	2
J	Number of caesarean section deliveries	150
K	Number of assisted deliveries	100
L	Number of babies born weighing <2,500 g	200
M	Number of babies born <37 weeks gestational age	140

ANSWER KEY: GROUP WORK: CALCULATING RATES

Stillbirth rate	(D/B) * 1,000	20/1,000births
Percentage of stillbirths that are antepartum	(F/D) * 100%	40%
Early neonatal mortality rate	(G/C) * 1,000	14.3/1,000 live births
Perinatal mortality rate	((D+G)/B) * 1,000	34/1,000 births
Neonatal mortality rate	(H/C) * 1,000	18.4/1,000 live births
Maternal mortality ratio	(I/C) * 100,000	204.1/100,000 live births
Caesarean section rate (all deliveries)	(J/A) * 100%	15.5%
Assisted delivery rate (all deliveries)	(K/A) * 100%	10.3%
Low birthweight rate (live births)	(L/C) * 100%	20.4%
Preterm rate (live births)	(M/C) * 100%	14.3%

ANNEX XX: CALCULATING TRENDS IN PERINATAL DEATHS

Complete calculations for the following indicators for the six months to see trends at the health centre.

TABLE 17. SIX MONTHS TRENDS AT A HEALTH CENTRE

	Jan	Feb	Mar	Apr	May	Jun	Total
A. Number of deliveries	14	22	16	20	26	14	112
B. Number of births	16	24	18	22	26	18	124
C. Number of live births	16	18	18	24	26	14	117
D. Number of stillbirths	2	2	1	0	0	2	7
E. Number of intrapartum stillbirths	1		0		0	0	1
F. Number of antepartum stillbirths	1	2	1	0	0	2	6
F. Number of early neonatal deaths (1–7 days)	2	4	0	0	0	4	10
Stillbirth rate D/B × 1,000							56.5/1,000 births
Percentage of stillbirths that are antepartum F/C × 100	50%	100%	100%			100%	85.7%
Percentage of stillbirths that are intrapartum E/C × 100	50%						14.3%

In six months, the stillbirth rate is 56.5/1,000 births, and 87.5% are antepartum stillbirths. Your committee will want to review these deaths. Three antepartum deaths were due to infection as a result of chorioamnionitis in the mother, one was due to a congenital anomaly, and two were due to hypoxia as the mother had eclampsia.

TABLE18. TABLE TO ASSIGN THE CAUSE OF PERINATAL DEATHS

Perinatal cause of death	Maternal condition						
	M1: Complications of placenta, cord, and	M2: Maternal complications of pregnancy	M3: Other complications of labour and delivery	M4: Maternal medical and surgical conditions	M5: No maternal condition identified	Other	**Total (%)**
Antepartum death (A)							
A1: Congenital malformations, deformations, and chromosomal abnormalities					1		16.7%
A2: Infection	3						50%
A3: Antepartum hypoxia				2			33.3%
A4: Other specified antepartum disorder							
A5: Disorders related to foetal growth							
A6: Foetal death of unspecified cause							
Total (%)	50%			33.3%	16.7%		

- A1M5
- A2M1
- A3M4

Based on this analysis, your committee decides to formulate a response plan.

ANNEX XXI: HMIS DATA AVAILABILITY FORM

TABLE 19. HMIS DATA AVAILABILITY REVIEW FORM

Your role/title					
Where do you work?	☐ Health centre ☐ District hospital ☐ District health office ☐ Other (please specify)				
Check the HMIS forms you use on a regular basis and complete the answers below (leave blank for forms you do not use).	☐ Patient record (partograph or other individual chart/ record)	☐ Hospital register	☐ Health centre register	☐ HMIS monthly summary reporting form	☐ Other forms or data sources (specify)
For each type of form you use, check if there is a designated space (standard data element) to record **individual (or cumulative)** maternal deaths (leave blank for forms you do not use).	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
For each type of form, check if there is a designated space to record the **cause** of maternal deaths (leave blank for forms you do not use).	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

If **YES,** indicate how the **cause** of maternal deaths is documented/captured in each form (leave blank for forms you do not use).	☐ Open-ended space (to write in cause)	☐ Open-ended space (to write in cause)	☐ Open-ended space (to write in cause)	☐ Open-ended space (to write in cause)	☐ Open-ended space (to write in cause)
	☐ Designated data elements (e.g., box to check for individual causes of death)	☐ Designated data elements (e.g., box to check for individual causes of death)	☐ Designated data elements (e.g., box to check for individual causes of death)	☐ Designated data elements (e.g., box to check for individual causes of death)	☐ Designated data elements (e.g., box to check for individual causes of death)
	☐ Not applicable	☐ Not applicable	☐ Not applicable	☐ Not applicable	☐ Not applicable
IF there is a designated data element for individual causes of maternal deaths, please check **which causes of maternal death are listed**.	☐ PPH ☐ APH ☐ PE/E ☐ Sepsis ☐ Obstructed labour	☐ PPH ☐ APH ☐ PE/E ☐ Sepsis ☐ Obstructed labour	☐ PPH ☐ APH ☐ PE/E ☐ Sepsis ☐ Obstructed labour	☐ PPH ☐ APH ☐ PE/E ☐ Sepsis ☐ Obstructed labour	☐ PPH ☐ APH ☐ PE/E ☐ Sepsis ☐ Obstructed labour

ANNEX XXII: INDIVIDUAL LEARNING PLAN

Learner's No.

Learner: _____

Facilitator: _____

Date: _____

Instructions: In the form on the following page, for each topic listed, assess your level of competency according to the scale given below.

Level of Competency Scale	
Low	Topic is new or unfamiliar to the learner.
Moderate	The learner is knowledgeable about the topic but will benefit from additional education.
High	Learner is highly knowledgeable on the topic and may be able to provide additional insight during the workshop.

Day/ session #	Learning objectives	Level of competence
1.	Describe the goals of maternal and perinatal death surveillance and response (MPDSR).	Low – Moderate – High
2.	Explain the guiding principles for maternal/perinatal mortality reviews.	Low – Moderate – High
3.	List the steps of the six-step mortality audit cycle.	Low – Moderate – High
4.	Identify maternal and perinatal deaths.	Low – Moderate – High
5.	Differentiate between direct and indirect obstetric deaths.	Low – Moderate – High
6.	Explain how to create and/or strengthen MPDSR committees.	Low – Moderate – High
7.	Describe the key roles and responsibilities of an MPDSR committee.	Low – Moderate – High
8.	Complete a maternal death review form.	Low – Moderate – High
9.	List the key components of perinatal death review form.	Low – Moderate – High
10.	Assign the cause of maternal death using ICD-10 MM.	Low – Moderate – High
11.	Assign the cause of perinatal death using ICD-10 PM.	Low – Moderate – High
12.	Develop an MPDSR response plan.	Low – Moderate – High
13.	Explain perinatal mortality rate definitions.	Low – Moderate – High
14.	Calculate and analyse perinatal mortality indicators.	Low – Moderate –High
15.	Monitor and analyse trends in maternal and perinatal deaths and death review findings over time using combined data sources to inform priority responses (health monitoring information system, death review findings, and data from the CRVS when available).	Low – Moderate – High

ANNEX XXIII A: MPDSR KNOWLEDGE ASSESSMENT QUESTIONNAIRE

Instructions: Please read carefully each question and circle the correct answer.

Learner's Name/No.

Please put your name or the number provided in the training in the box above.

1. Which is the best definition of a maternal death?
   a. The death of a woman while pregnant or within 42 days of termination of pregnancy from any cause related to pregnancy or its management, but not from accidental or incidental causes
   b. The death of a woman while pregnant or within 42 days of pregnancy, including any accidental or incidental causes
   c. The death of a woman while pregnant or within 42 days of pregnancy because of limited critical care services

2. How many steps are in the mortality audit cycle?
   a. 3 steps
   b. 6 steps
   c. 9 steps

3. What are the steps of the mortality audit cycle?
   a. Identify, locate, recommend solutions, implement recommendations, evaluate and refine
   b. Identify, collect information/notify, analyse information, recommend solutions, implement recommendations, evaluate and refine
   c. Identify, review, recommend solutions, and implement recommendations

4. Standardisation of identification of direct and indirect causes of maternal deaths are found in:
   a. ICD-10 PM
   b. ICD-10 MM
   c. ICD-20

5. What is the first step of the MDSR process?
   a. Review of the MDSR form
   b. identification of maternal deaths
   c. Analyse maternal or perinatal death

6. What single term should be written on the death certificate?
   a. Cause of mortality
   b. Underlying cause of death
   c. Morbidity agent

7. Which of the following is a direct cause of maternal death in pregnancy?
   a. Pre-eclampsia/eclampsia
   b. Cardiac disorder
   c. Thyroid disorder

8. Which term is defined as the death of a women from direct or indirect causes more than 42 days but less than 1 year after termination of pregnancy?
   a. Late maternal death
   b. Delayed maternal mortality
   c. Postpartum death

9. What is the underlying cause of death of a woman with HIV who dies of septic shock and renal failure after a spontaneous incomplete abortion?
   a. Renal failure
   b. Septic abortion
   c. Septic shock

10. A 20-year-old woman (30 weeks pregnant), was involved in a traffic accident and died soon after reaching the hospital. What ICD-10 MM group does this fall into?
    a. Direct maternal death
    b. Indirect maternal death
    c. Coincidental cause of death

11. A 30-year-old woman (38 weeks pregnant), underwent a caesarean section for foetal distress. She had just had a full meal and died on the theatre table because of aspiration following anaesthesia. What ICD-10 MM group does this fall into?
    a. Other obstetric complications
    b. Coincidental causes
    c. Unanticipated complication of management

12. A 16-year-old girl who was being treated for a high fever died suddenly after reaching the facility. She had taken an herbal medication 2 days earlier, following unprotected intercourse 2 weeks after her last menstrual period. How should the provider document this death?
    a. Coincidental cause of death
    b. Indirect maternal death
    c. Not a pregnancy-related death

13. What is the primary responsibility of the facility MPDSR committee?
    a. To review and develop response actions following maternal and perinatal deaths
    b. To penalise the provider involved in the maternal death
    c. To complete and send reports on maternal deaths to the district managers

14. How often should the facility MPDSR committee meet?
    a. When two or more similar maternal deaths are recorded
    b. Once or twice a year, depending on facility size
    c. After a maternal death or periodically, even if there is no death

15. Which types of maternal death are included in the ICD-10 MM classification system?
    a. Direct, coincidental, unspecified
    b. Direct, indirect, coincidental
    c. Direct, unspecified, indirect

16. Which of the following options includes examples of the three types of delay in the Three Delays Model?
    a. Waiting too long to seek care because of the financial implications, the length of time it takes to reach care because of poor roads, and timeliness of care because of understaffed facilities
    b. Receiving services at a busy facility, the time it takes to properly diagnose the root cause of an illness, and the time it takes medication or treatment to take effect
    c. The time it takes to find an affordable health care provider, the length of time it takes a provider to reach the patient, and the recovery time needed after a surgical procedure

17. Neonatal mortality rate (NMR) is measured as a rate per
    a. 1,000 live births
    b. 100 live births
    c. 1000 total births

18. Perinatal deaths include
    a. Deaths among early neonates (1-7 days after delivery) and stillbirths at or before 28 weeks of gestation
    b. Deaths among late neonates (8-28 days after delivery)and still births at or after 28 weeks of gestation
    c. Deaths among early neonates(1-7 days after delivery) and stillbirths at or after 28 weeks of gestation

19. Three distinct features of ICD-10 PM:
    a. Captures the time of a neonatal death in relation to its occurrence, a multilayered approach to the classification of cause of death and links the contributing maternal condition, if any, with perinatal death
    b. Captures the time of a perinatal death in relation to its occurrence, a multilayered approach to the classification of cause of death and links the contributing maternal condition, if any, with perinatal death
    c. Captures the time of a perinatal death in relation to its occurrence, a multilayered approach to the classification of cause of death and links the contributing foetal condition, if any, with perinatal death

20. 21-year-old, gravida 5, para 2+2, admitted at 34 weeks from her last menstrual period, with complaints of decreased foetal movement for two days. No foetal heart rate was noted on admission, labour was induced and delivered a stillborn baby weighing 1100 grams with signs of maceration on the skin. What is the outcome of pregnancy or type of perinatal death:
    a. Antepartum stillbirth
    b. Intra partum stillbirth
    c. Early neonatal death

ANNEX XXIII B: MPDSR KNOWLEDGE ASSESSMENT PRE-/POST-COURSE ANSWER KEY

Correct answers are in **bold**.

1. Which of the following is the best definition of a maternal death?
   a. The death of a woman while pregnant or within 42 days of termination of pregnancy from any cause related to pregnancy or its management, but not from accidental or incidental causes.
   b. The death of a woman while pregnant or within 42 days of pregnancy, including any accidental or incidental causes.
   c. The death of a woman while pregnant or within 42 days of pregnancy due to limited critical care services.

2. How many steps are in the mortality audit cycle?
   a. 3 steps
   b. 6 steps
   c. 9 steps

3. What are the steps of the mortality audit cycle?
   a. Identify, locate, recommend solutions, implement recommendations, evaluate and refine.
   b. Identify, collect information/notify, analyse information, recommend solutions, implement recommendations, evaluate and refine.
   c. Identify, review, recommend solutions, implement recommendations.

4. Standardisation of identification of direct and indirect causes of maternal deaths are found in:
   a. ICD-10 PM
   b. ICD-10 MM
   c. ICD-20

5. What is the first step of the maternal death surveillance and response (MDSR) process?
   a. Review of the MDSR form
   b. Identification of maternal deaths
   c. Analyse maternal or perinatal death

6. What single term should be written on the death certificate?
   a. Cause of mortality
   b. Underlying cause of death
   c. Morbidity agent

7. Which of the following is a direct cause of maternal death in pregnancy?
   a. Pre-eclampsia/eclampsia
   b. Cardiac disorder
   c. Thyroid disorder

8. Which of the following terms is defined as the death of a woman from direct or indirect causes more than 42 days but less than one year after termination of pregnancy?
   a. Late maternal death
   b. Delayed maternal mortality
   c. Postpartum death

9. What is the underlying cause of death of a woman with HIV who dies of septic shock and renal failure after a spontaneous incomplete abortion?
   a. Renal failure
   b. Septic abortion
   c. Septic shock

10. A 20-year-old woman (30 weeks pregnant), was involved in a traffic accident and died soon after reaching the hospital. What ICD-10 MM group does this fall into?
    a. Direct maternal death
    b. Indirect maternal death
    c. Coincidental cause of death

11. A 30-year-old woman (38 weeks pregnant) underwent a caesarean section for foetal distress. She had just had a full meal and died on the theatre table because of aspiration following anaesthesia. What ICD-10 MM group does this fall into?
    a. Other obstetric complications
    b. Coincidental causes
    c. Unanticipated complication of management

12. A 16-year-old girl who was being treated for a high fever died suddenly after reaching the facility. She had taken an herbal medication two days earlier, following unprotected intercourse two weeks after her last menstrual period. How should the provider document this death?
    a. Coincidental cause of death
    b. Indirect maternal death
    c. Not a pregnancy-related death

13. What is the primary responsibility of a facility maternal and perinatal death surveillance and response (MPDSR) committee?
    a. To review and develop response actions following maternal and perinatal deaths
    b. To penalise the provider involved in the maternal death
    c. To complete and send reports on maternal deaths to the district managers

14. How often should a facility MPDSR committee meet?
    a. When two or more similar maternal deaths are recorded
    b. Once or twice a year, depending on facility size
    c. After a maternal death or periodically, even if there is no death

15. Which types of maternal death are included in the ICD-10 MM classification system?
    a. Direct, coincidental, unspecified
    b. Direct, indirect, coincidental
    c. Direct, unspecified, indirect

16. Which of the following options includes examples of the three types of delay in the Three Delays Model?
    a. Waiting too long to seek care because of the financial implications; the length of time it takes to reach care because of poor roads; and timeliness of care because of understaffed facilities
    b. Receiving services at a busy facility; the time it takes to properly diagnose the root cause of an illness; and the time it takes the medication or treatment to take effect
    c. The time it takes to find an affordable health care provider; the length of time it takes a provider to reach the patient; and the recovery time needed after a surgical procedure

17. Neonatal mortality rate (NMR) is measured as the rate per
    a. 1,000 live births
    b. 100 live births
    c. 1,000 total births

18. Perinatal deaths include:
    a. Deaths among early neonates (1–7 days after delivery) and stillbirths at or before 28 weeks of gestation
    b. Deaths among late neonates (8–28 days after delivery) and stillbirths at or after 28 weeks of gestation
    c. Deaths among early neonates (1–7 days after delivery) and stillbirths at or after 28 weeks of gestation

19. Which of the following are three distinct features of ICD-10 PM:
    a. Captures the time of a neonatal death in relation to its occurrence; a multilayered approach to the classification of cause of death; and links the contributing maternal condition, if any, with perinatal death
    b. Captures the time of a perinatal death in relation to its occurrence; a multilayered approach to the classification of cause of death; and links the contributing maternal condition, if any, with perinatal death
    c. Captures the time of a perinatal death in relation to its occurrence; a multilayered approach to the classification of cause of death; and links the contributing foetal condition, if any, with perinatal death

20. A 21-year-old, gravida 5, para 2+2, is admitted at 34 weeks from her last menstrual period, with complaints of decreased foetal movement for two days. No foetal heart rate was noted on admission, labour was induced, and a stillborn baby weighing 1,100 grams with signs of maceration on the skin was delivered. What is the type of perinatal death?
    a. Antepartum stillbirth
    b. Intrapartum stillbirth
    c. Early neonatal death

ANNEX XXIV: MPDSR KNOWLEDGE ASSESSMENT PRE-/POST-COURSE MATRIX

Participants are assigned a number as their completed knowledge assessments are received. Correct the assessments and determine percentage score for each. Complete the matrix using a different colour for each question. For each wrong answer, fill in the box that corresponds to the question number under the participant number. Next, calculate and enter the percentage score for each participant in the bottom row (Total %).

Question number	Participant number																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total %
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
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ANNEX XXV: ZOOM GUIDE FOR FACILITATORS

1. General instructions
2. Renaming in Zoom
3. Whiteboard
4. Breakout rooms
5. How to raise hand
6. Online Kahoot! game

GENERAL INSTRUCTIONS

Facilitators will be made co-hosts of the workshop on Zoom. This will allow them to mute learners if noise becomes disruptive. Select the “Mute” button in the menu bar to mute yourself. To share your screen, select the “Share Screen” button.

To mute a participant, hover next to their name and select “Mute.”

RENAMING IN ZOOM

To change your name after entering a Zoom meeting, click on the “Participants” button at the top of the Zoom window.

Hover your mouse over your name in the “Participants” list on the right side of the Zoom window. You will see “Unmute” and “More” alongside your name. Click on “More” then click “Rename” and enter the name you want to be called during the workshop.

WHITEBOARD

1. To use the whiteboard, select “Share Screen.”

2. Select the Whiteboard

3. Move your mouse to the top of the screen until the bar below appears. Select the “More” option.

4. From the menu, click on the two menu options highlighted below.

5. Click on “Text” to type on the whiteboard. (For the “Roses and Thorns” exercise, instruct learners to use the Text tool to write under the “Roses and Thorns” heading that facilitators will have written on the whiteboard.)

Note: Recommended time distribution depends on the individual session.

BREAKOUT ROOMS

1. To initiate breakout rooms, click on “Breakout Rooms” in the grey bar at the bottom of the window.

2. The window below will pop up. Adjust the number of rooms to two or three, depending on the number of participants, and make sure that “Automatically” is selected.

3. Next, click “Create Rooms.”

4. The window shown below will appear. Select “Options” in the menu at the bottom of the window.

5. In the next pop-up window, check that the discussion time is listed correctly. (For example, if the discussion time is 30 minutes, change the time where indicated.)

6. Close the options menu and then select “Open all Rooms.”
7. While the group work is in progress, facilitators can enter the discussion rooms by selecting “Join.”

8. Once in the discussion room, the facilitator can leave by selecting “Leave Breakout Room” in the bottom menu.

Note: Recommended timeline for breakout sessions will depend on the session.

HOW TO RAISE HAND

Click on the “Participants” button and click “Raise Hand”; similarly, to lower hand, click on “Lower Hand.”

ONLINE KAHOOT! GAME

INSTRUCTIONS FOR FACILITATORS

1. The facilitators will go to http://kahoot.com and will share the link with participants through the chat box.

Facilitators should login using the following information:

Username: MPDSRKnowledge

Password: MPDSRKA

2. Click on "MPDSR Knowledge Assessment" in the top right corner

3. Select “Play” to generate a game. A pop-up window will appear whether the facilitator wishes to play as Host or as Challenge. Select “Host.”

4. The window shown below will appear. Click “Classic” to create a key for participants to join. The game PIN will appear at the top of the screen.

5. Enter the game PIN in the chat box

INSTRUCTIONS FOR PARTICIPANTS

Participants should download the Kahoot! app in advance of the training. To play the game, you will need a smartphone to enter your answers and a laptop to see the questions.

The host (workshop facilitator) will provide the game PIN.

1. Type www.kahoot.it in your smartphone browser to download the application.
2. Click “Play”.

3. Enter the Game PIN and click “Enter”.

4. Next, type your name and click “OK, go!” to enter the game.

5. Questions will appear on your laptop.
6. Each response is associated with a colour and shape.

7. Use your smartphone to answer questions by clicking the box with the colour/shape that corresponds to your response.

Points are awarded based on how quickly and accurately players answer.

ANNEX XXVI: CREATING A WHATSAPP GROUP FOR THE VIRTUAL MPDSR CAPACITY-BUILDING WORKSHOP

WhatsApp is a free messaging app in smartphones and personal computers that can be used for discussions or to share messages, photos, PDFs, videos, and audio files over the Internet.

OBJECTIVE

Creating a WhatsApp group for the workshop presents an alternative to in-person meetings among facilitators or between a mentor and mentee group before and during the workshop. It allows facilitators to conduct meetings among themselves in preparation for or following the workshop. Similarly, facilitators can use WhatsApp for virtual mentoring by forming a mentor/mentee group (three to five mentees per mentor). It also builds cohesiveness by allowing the group to discuss issues or problem-solve at any time.

HOW WHATSAPP WORKS

To use WhatsApp, a user needs a smartphone or tablet with a SIM card, an Internet connection, and a phone number. Participants can download the app from Google's PlayStore or from WhatsApp.com. The app uses the person's phone number as the username and the account is locked to the device. Users should store the phone number used to connect to WhatsApp on the device.

CREATING A WHATSAPP GROUP

A WhatsApp group needs someone to act as administrator to manage the group membership. For this workshop, a facilitator or mentor of the group will be the administrator. The administrator is the only person who can add or remove members, although other group members can remove themselves if they no longer want to be part of the team.

HOW TO SET UP A GROUP

1. Open WhatsApp and tap the "Chats" tab

2. In the top right-hand corner of your screen, tap the Menu icon, then tap "New Groups."

3. A list of your contacts will open. Tap on the names of the people you want to invite to join the group, then tap the green arrow on the bottom right-hand side of the screen.

4. A new screen will invite you to type in your group's name (e.g., MPDSR CB Workshop Nov). If you want to add a group icon, click on the empty photo box and select a photo from your phone or an image from the internet. The image will show up next to your group in your Chats list. Tap the green checkmark in the bottom right-hand corner and your group is set up.

ADDING NEW MEMBERS

Only the group administrator can add members. In WhatsApp, tap the group name or go to the menu and tap “Group info.” On the next screen, tap “Add participants” and choose a person from your contact list.

ANNEX XXVII: CHECKLIST FOR VIRTUAL MPDSR CAPACITY-BUILDING WORKSHOP

Facilitators' zipped file should contain the following:

- Reference materials:
  - National MPDSR guidelines
  - WHO's Maternal Death Surveillance and Response Technical Guidance (if national guidelines are not available)
  - WHO: Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation
  - The WHO application of ICD-10 to deaths during pregnancy, childbirth and puerperium: ICD-10 MM
  - The WHO application of ICD-10 to deaths during the perinatal period: ICD-10 PM
  - Medical certification, ICD-10 mortality coding, and reporting mortality associated with COVID-19: Technical note, 7 June 2020
  - Making Every Baby Count: Audit and review of stillbirths and neonatal deaths
  - Link or video, "Why Did Mrs. X Die?" https://www.youtube.com/watch?v=gS7fCvCIe1k&feature=youtu.be
- Virtual MPDSR Capacity-Building Guide for Facilitators
- Virtual MPDSR PPTs
- Day 4 documents
- Post-course questionnaire
- Evaluation

Learners' zipped file should contain the following:

- Reference materials:
  - National MPDSR guidelines (if national guidelines are not available)
  - WHO's Maternal Death Surveillance and Response Technical Guidance
  - WHO: Maternal and Perinatal Death Surveillance and Response: Materials to Support Implementation
  - The WHO application of ICD-10 to deaths during pregnancy, childbirth and puerperium: ICD-10 MM
  - The WHO application of ICD-10 to deaths during the perinatal period: ICD-10 PM
  - Medical certification, ICD-10 mortality coding, and reporting mortality associated with COVID-19: Technical note, 7 June 2020
  - Link or video "Why Did Mrs. X Die?" https://www.youtube.com/watch?v=gS7fCvCIe1k&feature=youtu.be
- Virtual MPDSR Capacity-Building Workshop Workbook for Learners
- Individual learning plan, MPDSR pre-course knowledge assessment

ANNEX XXVIII: DRAFT INVITATION LETTER

Dear _____,

Greetings. Welcome to the Virtual MPDSR Capacity-Building Workshop scheduled for the month of _____ 20__. The pre-workshop, with a 2 hour and 30 minute duration, will be held one week prior to the workshop using the Zoom platform. Please check the Zoom link in your email. Kindly download WhatsApp on your phone (if you are not currently using it) and provide us with your WhatsApp number as we will be creating a WhatsApp group for the workshop.

Date of pre-workshop: _____ 20__

Duration: One day from: _____ AM/PM to _____ AM/PM

Platform: Zoom (check link in mail)

Date of workshop: _____ 20__

Duration: Four days (three hours each day with an additional 30 minutes for the closing on Day 4)

Platform: Zoom (check link in mail)

Please follow these instructions:

1. Download the attached zipped file containing the following:
   - Virtual MPDSR capacity-building reference materials for learners
   - Virtual MPDSR Capacity-Building Workbook for Learners
   - Individual learning plan, MPDSR pre-course knowledge assessment
2. Complete the individual learning plan and pre-course knowledge assessment and send it to the facilitators within one week of receiving it.
3. Please notify the facilitators through email or WhatsApp if you have any problem with the documents or need clarification.
4. Prepare for the workshop per the guidance in the Virtual MPDSR Capacity-Building Workbook for Learners (See “Instructions for Learners: Advance Preparation”)
5. Check your Internet connection.
6. Note that you will need both a smartphone and a laptop on Day 2 for the Kahoot! game. It is better to have both throughout the workshop so you always have a backup.

ANNEX XXIX: MPDSR CAPACITY-BUILDING WORKSHOP EVALUATION FORM

INSTRUCTIONS: Please rate the MPDSR workshop using the following scale by highlighting:

1-Disagree 2-No Opinion 3-Agree

SN	Course Component	Course Rating
1	The workshop objectives were clearly presented	1 - - - - - - - 2 - - - - - - - 3
2	The workshop was presented in a helpful sequence	1 - - - - - - - 2 - - - - - - - 3
3	The workshop was well-balanced between presentations and practice exercises	1 - - - - - - - 2 - - - - - - - 3
4	The length and timing of sessions was appropriate for the workshop	1 - - - - - - - 2 - - - - - - - 3
5	The workshop enhanced my understanding of the goals of MPDSR	1 - - - - - - - 2 - - - - - - - 3
6	The workshop enhanced my understanding of the Six-Step Mortality Audit Cycle	1 - - - - - - - 2 - - - - - - - 3
7	I feel confident about my skills in identifying maternal deaths	1 - - - - - - - 2 - - - - - - - 3
8	The workshop improved my ability to differentiate between direct and indirect obstetric deaths	1 - - - - - - - 2 - - - - - - - 3
9	The workshop improved my ability to complete maternal death review forms accurately	1 - - - - - - - 2 - - - - - - - 3
10	The workshop improved my ability to complete Perinatal death review forms accurately	1 - - - - - - - 2 - - - - - - - 3
11	The workshop improved my ability to prepare a case summary	1 - - - - - - - 2 - - - - - - - 3
12	After the workshop, I feel confident assigning the cause of maternal death using the ICD-10 MM	1 - - - - - - - 2 - - - - - - - 3
13	After the workshop, I feel confident assigning the cause of perinatal death using the ICD-10 PM	1 - - - - - - - 2 - - - - - - - 3

14	The workshop enhanced my understanding of creating/strengthening an MDSR/MPDSR team	1 - - - - - - - 2 - - - - - - - 3
15	I feel confident about my ability to develop MDSR/MPDSR responses	1 - - - - - - - 2 - - - - - - - 3
16	I feel confident about my ability develop a process for tracking an MDSR response	1 - - - - - - - 2 - - - - - - - 3
17	After the workshop, I am comfortable identifying trends and commonalities within a collection of maternal/perinatal death data	1 - - - - - - - 2 - - - - - - - 3

PLEASE PROVIDE ANY ADDITIONAL FEEDBACK ON THE STRUCTURE AND CONTENT OF THE WORKSHOP.

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