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STILLBIRTH AND NEONATAL DEATH SURVEILLANCE AND RESPONSE SYSTEM PROTOCOL

First Edition 2023

Department of Woman & Child Health
Directorate General for Primary Health Care
Ministry of Health
Sultanate of Oman

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EXECUTIVE SUMMARY

Reducing maternal mortality, neonatal mortality and stillbirths have been prioritized in the Sustainable Development Goals (SDGs) and the Global Strategy for Women's, Children's, and Adolescent's Health. A key intervention for improving perinatal and neonatal survival requires understanding of the numbers and causes of death

Oman has an established and functioning maternal death review system. A Perinatal Death Surveillance and death system was established in Oman in the 1990s. Strengthening this system is included in the 10th five-year plan for Ministry of Health including assessment of the system, capacity building of the healthcare providers as well as developing a guiding protocol.

Thus, this guideline was developed to guide the healthcare providers in identification, reporting and reviewing the stillbirths and neonatal deaths. It standardizes the definition of stillbirths and neonatal deaths.

It is based on the World Health Organization guide "Making Every Baby Count Audit and Review of Stillbirths and Neonatal Deaths". The guideline uses the "WHO Application of ICD 10 to deaths during the perinatal Period" in classifying the causes of deaths to facilitate international classification.

The document explains in details the following:

- Identification and reporting stillbirths and neonatal deaths and the form to be used.
- Collecting information for the perinatal death review.
- Process of reviewing perinatal deaths
- Data collection and analysis to present trend and findings of the review
- Monitoring and evaluation of the system

ACRONYMS

DGHS	Directorate General of Health Services
HIS	Health Information System
ICD	International Classification of Diseases
MDG	Millennium Development Goals
MOH-HQ	Ministry of Health Head quarter
MPDSR	Maternal and Perinatal Death Surveillance and Response
PD	Perinatal Death
SCBU	Special Care Unit
WCH	Women And Child Health Department
WHO	The World Health Organization

INTRODUCTION

I. Background Information

The Sultanate of Oman has succeeded in reducing the infant mortality rate and the under-five mortality rate, achieving its intended MDG-4 in 2015. However, in the last five years there has been a slow reduction in these indicators. The under-five mortality rate declined from 11.7 (per 1000 live births) in 2016 to 10.5 (per 1000 live births) in 2021. Similarly, during the same period, the infant mortality rate has declined from 9.3 (per 1000 live births) to 8.1 (per 1000 live births). The major contributor to childhood mortality is neonatal mortality. The perinatal mortality rate has dropped from 13 (per 1000 live births) in 2015 to only 10.3 (per 1000 live births) in 2020.

Although Oman established Perinatal Deaths Surveillance Review and Response Systems since the 1990s, there are still a few challenges in the system in implementation. To overcome these challenges, strengthening the Perinatal Death Surveillance and Response system has been included in the current five-year plan of the Ministry of Health and in its joint plan of work with the World Health Organization (WHO).

Review and assessment of the Perinatal Death Surveillance and Response system took place last year (2021) in collaboration with the WHO. The review highlighted the gaps in the system that included lack of training and guidelines for healthcare providers. Therefore, the Department of Woman and Child Health developed this protocol to act as a guidance for the healthcare providers in identifying, reporting and reviewing perinatal deaths in the Sultanate of Oman.

II. Scientific Rationale

Reducing maternal and neonatal mortality and stillbirths have been prioritized in the Sustainable Development Goals. One of the main interventions to achieve this is through the strengthening the Maternal and Perinatal Death Surveillance and Response (MPDSR) to learn lessons and implement actions to prevent similar events in the future.

Considering the lack of a well-structured protocol for the reporting and reviewing of the perinatal deaths in the Sultanate of Oman, the development of a protocol of "**Perinatal death Surveillance and Response"** to act as a guide for health care providers, is of urgent mandate.

The protocol will follow the six steps of mortality audit cycle recommended by the World Health Organization:

1. Identifying cases
2. Collecting information
3. Analysing information
4. Recommending solution
5. Implementing solutions
6. Evaluating both the process and the outcomes, and refining the process as indicated

AIMS AND OBJECTIVES

I. Aim

To provide guidance for health care providers on the implementation of national system on perinatal death surveillance review and response in Oman.

II. Objectives

a) To standardise the definitions, principles, processes and concepts used in MPDSR in the Sultanate of Oman.
b) To provide guidance on identification and reporting of perinatal deaths.
c) To provide guidance on reviewing perinatal deaths
d) To guidance on analysis and interpretation of data collected on perinatal deaths.
e) To clarify roles and responsibilities of different stakeholders and health professionals.

METHODS AND PROCEDURES

I. Definition of Terms:

A. **Live Birth:** The complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which after such separation, breathes or shows any evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached.

B. **Still Birth**: A fetal death with no signs of life and weighing 500 gm and above irrespective of the fetal gestation.

C. **Antepartum Stillbirth**: A death of a fetus occurring before the onset of labour irrespective of the fetal gestation**.**

D. **Intrapartum Stillbirth:** A death of the fetus occurring after the onset of labour and before delivery of the baby**.**

E. **Still Birth of Unknown Time**: A stillbirth with unknown timing of death with reference to onset of labour/ lack of evidence to classify as before or after the onset of labour

F. **Neonatal Death:** A death of a live born baby within 28 days of birth

G. **Early Neonatal Death:** A death of a baby within 7 days of birth

H. **Late Neonatal Death:** A death of a baby after 7 days and before 28 days of birth.

I. **ICD-PM:** is an application of ICD-10 that groups the ICD codes used to classify perinatal causes of death and those used to classify the maternal condition at the time of death, to facilitate straightforward and consistent capture that makes it easy to identify where programme interventions should be targeted to impact the health of both mother and baby.

J. **A modifiable factor:** is a factor that may have prevented the death if a different course of action had been taken.

K. **Preterm labour:** as a maternal condition applies to those mothers who present prior to 37 completed weeks of gestation with spontaneous onset of contractions and cervical change in the absence of any apparent underlying pathology (e.g., chorioamnionitis or urinary tract infection).

L. **Booked mother:** A mother who was registered in ANC clinic, and a unique ANC registration number was issued to her along with maternal health record.

M. **Maternal Health Record (Green Card)**: It is a personal health record that is issued to pregnant woman the time of booking with a unique antenatal number.

II. Identification and reporting perinatal deaths

Stillbirths that occurred in the delivery suite, antenatal wards should be recorded and reported. If a known pregnant woman had stillbirth outside the healthcare facility (in the community) and she presented to a healthcare facility, such stillbirth should be recorded and reported.

Confirmed neonatal deaths that occurred in the healthcare facility or in the community should be reported also.

A. When to report perinatal deaths?

Perinatal deaths either occurred in the healthcare facility should be reported within 24 hours of occurrence of death using the "Stillbirth and Neonatal Death Notifications Form". The deaths that occurred in the community Should be reported within 48 hours.

Zero reporting should also be reported.

B. Responsibility of reporting perinatal deaths

- **Stillbirth:** The physician (Obst/Gyn, medical officer) who has attended/supervised or was responsible for the delivery should report the stillbirth and complete the Stillbirth and Neonatal Death Notification Form. At a facility with no female doctor, the form should be completed by a nurse/midwife who attends the delivery, and she should get it counter-signed by the Medical Officer In-charge of the healthcare facility.

  The staff nurse in-charge of delivery suite should every day:

  - Ensure reporting of the stillbirth by the attending doctor.
  - Ensure complete filling of the Stillbirth and Neonatal Death Notification.
  - In case of under reporting, she should raise the issue to the director/ head of department of obstetrics and gynaecology.

- **Neonatal death:** The attending/supervised doctor (neonatologist, paediatrician, medical doctor) should notify the neonatal death and complete the Stillbirth and Neonatal Death Notification Form as well as completing the Internal Deaths Notification Form.

  The staff nurse in-charge of SCBU/paediatric A&E/paediatric ward to:

  - Ensure reporting the case by the attending doctor.
  - Ensure complete filling of the notification form.
  - In case of under reporting, she should raise the issue to the director/ head of department of Paediatrics.

C. Stillbirth and Neonatal Death Notifications Form

- **Description of the Stillbirth and Neonatal Death Notification Form (Annex 1: Stillbirth and Neonatal Death Notification Form)**

The form has three copies.

1. **White copy (original)** should be sent to the Governmental head of Woman and Child Health section in the respective governorate, who is responsible for the following:
    - Receive the reported cases from the respected Governorate.
    - Review and ensure completion of the reported notification forms.
    - Keep recording of data in the database (excel sheet) and verify any missing data with HIS at governorate level.
2. **Green copy: (duplicate 1)** should be retained at the institution for record purpose.
3. **Pink copy: (duplicate 2)** should be sent to the Health Information and Statistics (HIS) Department at Hospital.

- **Instruction for completing the Stillbirth and Neonatal Death Notifications Form**

1. **Name of Governorate:** write the name of the Governorate in which the death happened.
2. **Reporting health institution:** write the full name of the health institution in which you are reporting the case.
3. **Type of death:** tick the type of death that has happened in the institution.
4. **Details of death:** write the date, time of death and the age at the time of death in case of neonates.
5. **The booking status of the mother:** Indicate if the women is booked or un-booked for antenatal care for the current pregnancy.
6. **Name of the parent institution:** write clearly the name of the parent institution from the front page of the woman's ANC card in the space provided.
7. **ANC registration number:** write the ANC number as it is written in the front page of the woman's ANC card. This is a unique number for each pregnant mother.
8. **Admission at:** write the date of admission to the health institution where the death has occurred.
    - **Demographic characteristics of the woman:**
        - Full name of the woman including tribe**.**
        - Age of the woman in completed years.
        - occupation: whether employed or a housewife.

- Telephone number: write the woman's current telephone number.
- Nationality: Please indicate if the woman is Omani or non-Omani by ticking the appropriate box.
- Marital status: please indicate the marital status of the woman on the time of reporting by ticking the appropriate box.
- Education level: Select the woman's education level mentioned in the ANC card.
- Fathers' details**:** write the name of the father including tribe, address, willayat, Governorate and his nationality.

9. Mothers Obstetric History:

- **Gravidity:** write the total number of times that woman has been pregnant including the current pregnancy.
- **Parity**: write the total number of times that women has given birth to a foetus with a gestational age of ≥ 24 weeks, regardless of whether the child was born alive or was stillborn.
- **Number of previous abortions:** write the total number of induced or spontaneous expulsion of a fetus the woman experienced before 22 weeks of gestation**.**
- **Number of previous caesareans:** write the total number of caesarean sections the woman has undergone.
- **Number of previous stillbirths:** write the total number of babies born dead weighing ≥500 grams regardless of the gestational age.
- **Total number of living children:** write the total number of woman's living children.

10. Mother current pregnancy:

- Tick in the box the number of ANC visits the woman had during her current pregnancy.
- Select the type of pregnancy the woman had whether singleton, twin or multiple. If you don't know, select unknown.

11. Medical/obstetric history:

- Select from the list if the mother had any obstetric problem during her current pregnancy.

12. Past obstetric problem:

- Select from the list if the mother had any obstetric problem in her previous pregnancies.

13. Any present medical diseases:

- Select from the list if the woman had any medical illnesses during her pregnancy.
- Indicate if the woman has a family history of any medical condition.

14. **Consanguinity:**

- Indicate if there is any present consanguinity between the woman and her husband and if yes, tick the degree of consanguinity.

15. Lab Investigations:

- **RPR (**Rapid plasma reagent)**:** indicate if the woman had a syphilis test and if yes, tick the box to indicate whether the test was positive or negative.
- **Blood group:** write the type of patients' blood group.
- **Rhesus factor:** write whether the patient has a positive or negative rhesus factor.
- **Hb last recorded:** write the last haemoglobin recorded in patients ANC card.
- **Sickling test:** write whether the patient has a positive or negative test.
- **Blood sugar:** write the last blood sugar recorded in patients ANC card.
- **Highest recorded:** write the highest blood sugar recorded in patients ANC card.
- **OGTT result: write blood glucose test (fasting and 2 hours post glucose)**
- **On admission:** indicate the details of the tests done for the patient during admission. (e.g., urinary sugar)

16. Details of labour:

- Indicate the date and timing of birth.
  - Gestational age: the gestational age at the time of delivery.
  - Onset of labour: indicate whether the labour was spontaneous or induced. If the woman was not in labour, please select not in labour.
  - Labour augmented: select whether the labour was augmented or not.
  - Place of birth: indicate if the woman delivered in a healthcare facility or not.
  - Mode of birth: select the appropriate mode of delivery the woman had. e.g., SVD, LSCS
  - Attendant at delivery: indicate the person who attended the delivery e.g., midwife, nurse, doctor or others.

17. Delivery notes:

- Write the blood pressure (BP) on admission in mm Hg.
- Time spent in each stage of labour in hospital for all three stages (in hours and minutes).
- Fetal heart rate at time of admission: indicate whether the heart rate was present on admission or not.
- If heart rate was present, indicate the type of heart rhythm (tachycardia, bradycardia) or if deceleration was present.

- Meconium staining of liquor: indicate whether meconium was present or not and if present indicate its type whether dark or light.
- Weight of placenta: write weight of placenta in grams.
- Retro-placental clot: indicate whether retro-placental clot was present or not.
- Any abnormal placenta: indicate whether any abnormalities in placenta was noted or not. In case of other abnormalities noted, tick others.

18. Fetal/Neonatal details:

- Select the condition of the baby at birth.
  - Stillbirth or neonatal death
  - If stillbirth, please specify the type (fresh or macerated stillbirth) and the timing of stillbirth (Intrapartum, antepartum or unknown)
  - If neonatal death, please specify the type (early or late neonatal death)
  - Date and time of neonatal death: indicate the date and place of neonatal death.
- Birthweight in grams: write the weight of the stillbirth or neonate in grams.
- Sex of the foetus/neonate: indicate the sex of the stillbirth or neonate if known. If unknown, please select unknown.
- Apgar score for (Neonatal deaths): write the Apgar score of the neonate at 1 and 5 minutes. If unknown, please select unknown.
- Resuscitation (Neonatal deaths): indicate whether resuscitation was needed for the neonate or not and if needed select the type of resuscitation needed. If needed but not done, please select not done. If unknown, please select unknown.
- Birthweight: record the birth weight of the new-born on the corresponding growth chart on the child health record HP140.
- Any congenital anomalies: write if congenital anomaly was present or not. If present, specify the type.
- When foetal movements last felt before birth: write the time when the foetal movements were last felt by the mother.
- Any other remarks: please write any other remarks of importance.

Note: ***In case of multiple births to a mother born dead, fill a separate notification form for each foetal death.***

- **Dispatch of and management the Stillbirths and Neonatal Deaths Form**

1. **For stillbirths, the staff nurse in-charge of delivery suite should s**end a copy of the form to; the Health Information and Statistic Department (HIS) in the hospital once a week and keep a copy as the institution record.
2. **For** (Neonatal deaths): **the staff nurse in-charge of SCBU/Paediatric A&E/Paediatric Ward/health facility to s**end a copy of the form to the Health Information and Statistic Department in the Hospital once a week and to keep a copy as the institution record.
3. **Health Information and Statistic (HIS) Department at Hospital should.**
   - Send the reported forms to the HIS section at Directorate General of Health Services (DGHS) at Governorate level by mailbox on a weekly basis.
   - Send a copy of the form to the Head of Woman and Child Health Section **(WCH)** at Governorate level mailbox on a weekly basis
   - Keep a copy as the institution record
4. **Health Information and Statistics Section at Directorate General of Health Services (DGHS) should:**
   - Review the received forms and check completeness.
   - Record the data in the epi info database.
   - Send the collected data to the HIS Department at MOH-HQ
5. **Department of Health Information and Statistics, MOH-HQ should:**
   - Receive the collected data from the HIS Department of all Governorates.
   - Check completeness of data.
   - Record Data in a National Database.
   - Analyze the collected data and publish it in the annual health report.

Note: Private hospitals should complete and send the Stillbirths and Neonatal Deaths Form and send it to the Health Information and Statistics Section Directorate General of Health Services at the respective governorate.

III. Collecting information for the perinatal deaths review

Copy of Maternal Health Record "Green Card" should be kept from mother file. Staff nurse in-charge should ensure such copy before the discharge of the mother. The green card contains details of pregnancy and the care received since registration to the antenatal care clinic. It is expected to have information of all ANC visits in anywhere the woman attended. It will assist in understanding the pregnancy journey and the care the mother received. In addition, a copy of the Child Health Record "Pink Card" should be taken for cases of neonatal deaths. It is the responsibility of the nurse in-charge of the maternity ward/postnatal/ SCBU to ensure that a copy of these card is taken before the discharge of the mother.

Detailed history should be taken from the mother about the healthcare facility that she attended, and care received. This information should be recorded in the patient's medical records. Such information can assist in collecting the medical files from these healthcare facilities later before reviewing and discussing the cases.

It is advice to have a focal person in each healthcare facility who will be responsible for collecting all relevant document and information for the cases to be discuss.

The Head of Woman and Child Health should collect all relevant documents and medical files of the mother and new born from the healthcare facilities before reviewing and discussing cases of stillbirths and neonatal deaths.

IV. Review of perinatal deaths (analysing the information)

- **Purpose of the review**

Perinatal deaths review is a qualitative, in-depth investigation of the causes of, and circumstances surrounding perinatal deaths to identify the causes, associated factors, assess the quality of care provided and identify lessons to be learned to prevent similar deaths in future.

- **Place and frequency of the perinatal deaths**

Review of perinatal deaths should take place at three levels.

1. **Facility review:** for all perinatal deaths that occurred in the facility. The review should be done once a month or more frequently based on the number of cases and the size of the healthcare facility.

This review should be done by a multidisciplinary team consisting of obstetricians, neonatologists/paediatrician, midwives, SCBU nurses, and representative of quality assurance. The review can be chaired by head of obs/gyn. or paediatric department.

2. **Regional review:** which should be done by the regional maternal and perinatal death committee for cases that occurred in the respective governorate, to understand the trend, identify causes, and associated factors at governorate level to take action and implement interventions that can reduce the perinatal deaths at governorate level.

   The regional committee members should be:

   - Director General of health services of the Governorate(chairperson)
   - HOD Obstetrics and Gynaecology department at the Tertiary/secondary/regional referral hospitals (member).
   - Head of Women and Child health in the governorate (member and rapporteur).
   - HOD paediatrics department Tertiary/secondary/regional referral hospitals(member).
   - HOD nursing and midwifery in the directorate (member)
   - In-charge of the delivery suite of the hospital (member).
   - In-charge of SCABU in the hospital(member).
   - Other members that could have an impact and were invited by the committee members.

3. **National review:** A sample of cases will be review by a national committee to ensure quality of review as well to understand the pattern of causes and associated factors at national level.

- **Preparation for conducting perinatal deaths review.**

- Set a specific time for the meeting.
- The rapporteur of the committee should prepare a list of cases to be discussed and send files for the members.
- The code of practice should be distributed to the members (Annex 2: Code of practice)

- **Process of the review**

The chairperson should start the meeting and remained the members about “no blame, no shame”.

At all levels of the review, the committee is advised to go through the chain of events before the death starting from beginning of the pregnancy as such approach would assist in identifying the cause of death, contributing conditions and factors and quality of care.

After discussing each case, the committee members should agree on the following:

1. **Timing and cause of death**

- **Timing of death:** knowing the timing of the perinatal death is critical The timing of perinatal death is classified as antepartum (A), intrapartum (I) or neonatal (N) based on ICD-PM
- **Cause of death:** The main disease or condition in the foetus or infant is the disease or condition that initiated the morbid chain of events leading to death. ICD-PM groups the main condition in the foetus or infant into a limited number of categories of cause of death under the three headings for timing of death (i.e. A, I or N; see Annex 3: Foetal Cause of death -based on ICD-PM Foetal Condition Group).
  - There are six groups of **antepartum** causes of death, designated by a leading "A";
  - Seven groups of **intrapartum** causes of death, designated by a leading "I";
  - and 11 groups of **neonatal** causes of death, designated by a leading "N".
- **Maternal condition:** the main maternal condition at the time of presentation of the perinatal death that contributed to perinatal death (e.g., hypertensive disease in macerated stillbirth, breech extraction in acute intrapartum event).

  Identifying maternal condition that contributed to death is important to understand the whole story that leads to occurrence of the death. Some of these conditions can also cause maternal deaths. interventions can be implemented to address these conditions which can reduce both maternal and perinatal deaths.

  According to ICD-PM, maternal conditions are classified into five groups as follows (Annex 4: Maternal Conditions/risk factors after review ICD-PM Maternal Condition Group)

  - **M1** –complications of placenta, cord and membranes.
  - **M2** – maternal complications of pregnancy
  - **M3** –complications related to labour and delivery.
  - **M4** – the medical and surgical conditions, which may or may not be related to the present pregnancy (e.g. pre-eclampsia or pre-existing hypertension).
  - **M5** – "no maternal condition". When no maternal condition that might have been on the causal pathway for the perinatal death was identified at the time of presentation of the perinatal death

  In summary, based on ICD-PM, the perinatal deaths are classified in a three-step process:

  - Deaths are first grouped according to timing – whether the death occurred in the antepartum period (prior to the onset of labour), intrapartum (after the onset of labour) or in the neonatal period. (early neonatal: up to day 7 of postnatal life)
  - The main cause of perinatal death is assigned and grouped according to the new ICD-PM groupings.

- The main maternal condition at the time of perinatal death is assigned and grouped according to the new ICD-PM groupings.

2. **Factors associated with perinatal deaths.**

Discussion of critical delays/modifiable factors in terms of levels of system failure is crucial to guide formulating interventions to avoid similar death in future. Root cause analysis can be used to identify these factors. Three categories of factors should be discussed:

Family Factors: factors that linked to the mother or the family, such as

- The mother had no antenatal care
- Cultural restrictions/beliefs that prohibit the mother from seeking care at the right time.
- The mother had no knowledge of the danger signs
- Financial constraints/no transport

Medical Team factors: Factors that are related to the medical team who took care of the mother and the neonate. Examples:

- Partograph was not used/not available
- A health-care provider was unable to give adequate resuscitation
- Delay in referral to higher healthcare facility
- Mother didn't receive adequate monitoring during labour
- Attending doctor failed to call the senior doctor for opinion

Health Facility factors: factors that are related to the health where the care was provided to the mother and the neonate. Examples:

- Unavailability or shortage of specialized staff (e.g. neonatologist, specialized staff nurses in SCBU)
- Unavailability of operating theatre
- Unavailability of resuscitation equipment's (e.g., Ambu bag, intubation sets)
- Unavailability of blood products
- Unavailability of skilled staff e.g., anaesthetists

3. **Quality of care**

The committee should assess the quality of care and identify the strengths and the weakness in the case management according to the national and international standards for the management of such case. Based on its findings, cases are categorized on the overall quality of care as

- **Good care**: Cases without a deficiency in received quality of care

- **Improvements in quality of care were identified, and if these had been in place it would still have made no difference to the outcome:** Cases in which a deficiency in quality of care was identified, but it would not have affected the outcome.
- **Improvements in quality of care were identified, and if these had been in place it might have made a difference to the outcome**: cases in which at least one deficiency in quality of care was identified which might have made a difference to the outcome.
- **Non-assessable**: when it was difficult to categorise the case into the above three categories due to lack of information.

4. Recommendations

Based on the identified causes and associated factors, the committee should agree on specific recommendations to address the identify gaps and factors. Recommendations may include a variety of topics, such as community education and involvement, timeliness of referrals, access to and delivery of services, training needs of healthcare protocol, regulations and policy, etc.

The recommendations should be SMART (specific, measurable, appropriate, relevant and time -bound). A focal person should be assigned to follow-up the implementation of the recommendations.

- **Recording the finding of the meeting**

The Head of Woman and Child Health should record the minutes of the meeting including the names of the attendees and summary of the main findings and recommendations (Annex 5: Format for the Minutes of the stillbirth and neonatal death meeting (framework). The typed minutes should be verified by the chairperson and circulated to all attendees.

It is very important to send feedback for the healthcare facilities about the result of the regional and national reviews.

For each case discussed, the findings of the review should be summarised in the Stillbirth and Neonatal Review Form (Annex 6: Stillbirth and Neonatal Death Review Form).

The form has different sections:

1. The mother's demographic information: to be obtained from ANC card/PD notification form (name, age, IP/OPD number and her status of booking).
2. Summary of the case
3. Timing of death
4. Foetal causes

5. Maternal condition
6. Associated factors.
7. Observations and recommendations are to be filled during the meeting.

The Head of Woman and Child Health should compile all forms and send them to the Department of Woman and Child Health.

The flowchart in Annex summarizes the dataflow of Stillbirth and Neonatal deaths (Annex 7: Flowchart of the Stillbirth and Neonatal Death Surveillance and Review System in Oman).

MEASUREMENT OF EFFECT

I. Data collection and analysis:

Data from Stillbirth and Neonatal Deaths and the review form should be compiled and entered in the pre-designed Excel file. Compiling data can illustrate what are the common causes and associated factors. It can also highlight the gap in the system and in the community.

The aggregated data should be analyzed to monitor the trend and effect of interventions. Based on the analysis, action can be taken at different levels.

The result of the analysis should be shared with all stakeholders including healthcare providers.

II. Monitoring and evaluation

Monitoring and evaluation of Perinatal Deaths Surveillance and Response is very crucial to ensure action is taken and quality of care is improving. It is very important to assess if the recommendations are implemented within a given timeline. If they are achieving the desired results and, if not, where any problem may lie. Time should be allocated at the beginning of each meeting to summarize what was done regarding the recommendations of previous meetings. Indicators can be used to monitor the trend and performance overtime.

In addition, it is important to monitor the process of notification and collection of required data for the review meeting. Underreporting can be identified through cross-checking the data with other sources such as the National Births and Deaths System.

DOCUMENT HISTORY AND VERSION CONTROL TABLE

Version	Description	Review Date
01	Initial Release – 1st Edition	2023

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ANNEXES

Annex 1: Stillbirth and Neonatal Death Notification Form

STILLBIRTH AND NEONATAL DEATH NOTIFICATION FORM

Sultanate of Oman
Ministry of Health
Directorate General of Primary Health Care
Department of Woman & Child Health

Reporting Governorate: .....
Reporting Health Institution: .....

Type of Death ☐ Stillbirth ☐ Early Neonatal Death (0-6 days) ☐ Late Neonatal Death (7-28 days)	Date of Death: .....(dd/mm/yyyy) Time of Death: ..... hours Age at time of death:	Antenatal Care: ☐ Unbooked ☐ Booked Name of Parent Institution: ..... ANC registration number: ..... Hospital Admission number: ..... Mother's Civil ID #: .....

Mother's 1st Name:	2nd Name:	3rd Name:	Tribe:	Mother's Nationality: ☐ Omani ☐ Non-Omani
Mother's Age:	Occupation (Housewife/Others Specify):		Tel. No.	

Marital Status: ☐ Married ☐ Divorced ☐ Widowed ☐ Single ☐ Unknown
Education Level: ☐ No Schooling ☐ Primary ☐ Middle ☐ Secondary ☐ College ☐ Postgraduate ☐ Unknown

Father's 1st Name:	2nd Name:	3rd Name:	Tribe:	Father's Nationality ☐ Omani ☐ Non-Omani
Address	Governorate		Wilayat:	

Mother's Obstetric History:

a) Gravidity: .....
b) Parity: .....
c) Number of previous abortions: .....
d) Number of previous caesareans .....
e) Number of previous stillbirths: .....
f) Total number of living children: .....

Mother's Current Pregnancy: (please select):

a) Antenatal Care Number of visits (if booked)
☐ 1 ☐ 2 ☐ 3 ☐ 4 or more ☐ Unknown

b) Type of Pregnancy: (select One)
☐ Singleton ☐ Twin ☐ Multiple (> 2) ☐ Unknown

Medical / Obstetric Problems

Present Obstetric Problem:
☐ Pregnancy induced hypertension
☐ Threatened abortion
☐ Abruptio placentae
☐ Placenta praevia
☐ Prelabour rupture of membrane (>24hrs)
☐ Preterm labour
☐ Polyhydramnios
☐ Oligohydramnios
☐ Gestational diabetes
☐ Fetal growth restriction
☐ Breech or another malpresentation
☐ Multifetal pregnancy
☐ Cord prolapse
☐ Cord around the neck
☐ Isoimmunisation
☐ Exanthematous infection during pregnancy
☐ Others (specify):

Past Obstetric Problem:
☐ Prev. Low birth weight
☐ Prev. preterm delivery
☐ Abortion
☐ Polyhydramnios
☐ Oligohydramnios
☐ Previous C/S
☐ Received Anti D inj. In the past & when
☐ Pregnancy induced hypertension
☐ Antepartum haemorrhage
☐ Prelabour rupture of membranes
☐ Gestational diabetes
☐ Isoimmunisation
☐ Others (specify): .....
☐

Any Present Medical Diseases:
☐ Chronic Renal Disease
☐ Hypertension
☐ CVD ☐ Syphilis
☐ HIV
☐ Hepatitis
☐ Anaemia (Hb <11gm)
☐ Diabetes
☐ Mental health related issues
☐ Other:

Family History
☐ Diabetes mellitus
☐ Hypertension
☐ Congenitally malformed babies
☐ Consanguinity ☐ Yes ☐ No
☐ 1st Cousin
☐ 2nd Cousin

Lab Investigations

RPR: ☐ Pos ☐ Neg Blood Group: ..... Rh. Factor: ☐ Pos ☐ Neg Hb Last Recorded: ..... gm/dl
Blood Sugar: Random: ..... mmol/1 OGTT Result: Fasting: ..... mmol/1 2 hours post: ..... mmol/l
Sickling: ☐ Pos ☐ Neg Any other: .....
On Admission: Urinary Sugar: ☐ Pos ☐ Neg. Protein: ☐ Pos ☐ Neg Hb: ..... gm /dl Blood Sugar: ..... mmol/ Any other: .....

Details of Labour:

Date of Birth: ..... Time of Birth: ..... Gestational age ..... Onset of labour ☐ Spontaneous ☐ Induced ☐ Not in labour
Labour augmented ☐ Yes ☐ No

Place of birth: ☐ Health Facility ☐ In transit ☐ Home ☐ Others (specify) :	Mode of birth: ☐ SVD ☐ Assisted - ☐ Ventouse ☐ Forceps ☐ LSCS ☐ Elective ☐ Emergency	Attendant at Delivery: ☐ Midwife ☐ Nurse ☐ Doctor ☐ Others (specify): .....

Delivery Notes:

BP on Admission: ..... / ..... mm Hg
Time spent in each stage of Labour in hospital:
☐ First Stage: .....hr..... min
☐ Second Stage : .....hr..... min
☐ Third Stage: .....hr..... min

Fetal Heart rate at time of admission: ☐ Yes (..... /min) N☐
Fetal tachycardia ☐ bradycardia ☐ severe variable or late decelerations
Meconium staining liquor: ☐ Yes ☐ No
(If yes, please select): ☐ Dark ☐ Light

Weight of placenta: .....gm
Any retro- placental clot ☐ Yes ☐ No
Any abnormal placenta ☐ Yes ☐ No
Others:

Fetal /Neonatal Details (please fill or select appropriately):

Stillbirth, types:
☐ Macerated
☐ Fresh

☐ Timing of stillbirth
☐ Intrapartum
☐ Antepartum
☐ Unknown

Birthweight in gms: .....
Sex of Fetus/neonate:
☐ Male
☐ Female
☐ Ambiguous
☐ Unknown
Apgar Score: (for ENND)
1 minute: .....
5 minutes: .....
Unknown: .....

Resuscitation (for ENND)
☐ Not Needed
☐ Needed
☐ Not Done
☐ Bag and mask
☐ Intubated
☐ Unknown
Birthweight below 10th centile ☐ above 90th centile ☐
Any Congenital Anomaly (Specify): .....
When fetal movements last felt before birth:.....hrs.....days

Any other remarks.

Cause of Death:

Name & Signature of Physician:	Date of Notification:	Signature & Stamp:

Definition.
A fetus born with a birthweight of 500 gm. and above, with No Signs of Life. (Irrespective of the gestational age). (Still Birth = Fetal Death)
N.B. Please tick [√] wherever applicable. Fill a separate form for each fetal deaths in case of multifetal births with fetal adeaths).

Annex 2: Code of practice

CODE OF PRACTICE

To show respect for the 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; and

• try as much as possible (recognizing 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 3: Foetal Cause of death -based on ICD-PM Fetal Condition Group

6. Foetal Cause of death: (Please select the most appropriate cause): **** based on ICD-PM Foetal Condition Group***		
Antepartum: 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	**Intrapartum:** I1: Congenital malformations, deformations and chromosomal abnormalities I2: Birth trauma I3: Acute intrapartum event I4: Infection I5: Other specified intrapartum disorder I6: Disorders related to foetal growth I7: Intrapartum death of unspecified cause	**Neonatal Death** 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 birth weight and prematurity N10: Miscellaneous N11: Neonatal death of unspecified cause

Annex 4: Maternal Conditions/risk factors after review ICD-PM Maternal Condition Group

<table>
<tr><th colspan="3">Maternal Conditions / Risk Factors after review (Please select the most appropriate):
* based on ICD-PM Maternal Condition Group</th></tr>
<tr><th>M1: Complications of placenta, cord and membranes</th><th>M2: Maternal complications of pregnancy</th><th>M3: Other complications of labour and delivery 1</th></tr>
<tr><td>▪ Placenta praevia
▪ Other forms of placental separation and haemorrhage
▪ Placental dysfunction, infarction, insufficiency
▪ Fetal–placental transfusion syndrome
▪ Prolapsed cord / other compression of umbilical cord
▪ Chorioamnionitis
▪ Other complications of membranes</td><td>▪ Incompetent cervix
▪ Preterm rupture of membranes
▪ Oligohydramnios / polyhydramnios
▪ Multiple pregnancy
▪ Maternal death
▪ Malpresentation before labour
▪ Other complications of pregnancy</td><td>▪ Breech delivery and extraction
▪ Other malpresentation, malposition, and disproportion during labour and delivery
▪ Forceps delivery / vacuum extraction
▪ Caesarean delivery
▪ Precipitate delivery
▪ Preterm labour and delivery
▪ Other complications of labour and delivery</td></tr>
<tr><th colspan="2">M4: Maternal medical and surgical conditions; noxious influences</th><th>M5: No maternal condition</th></tr>
<tr><td>▪ Pre-eclampsia / eclampsia
▪ Gestational hypertension
▪ Other hypertensive disorders
▪ Renal and urinary tract diseases
▪ Infectious and parasitic disease
▪ Circulatory and respiratory disease
▪ Nutritional disorders
▪ Injury
▪ Road traffic accident
▪ Surgical procedure
▪ Other medical procedures</td><td>▪ Maternal diabetes including gestational diabetes
▪ Maternal anaesthesia and analgesia
▪ Maternal medication
▪ Tobacco / alcohol / drugs of addiction
▪ Nutritional chemical substances
▪ Environmental chemical substances
▪ Sickle cell disease
▪ Rh isoimmunisation
▪ Autoimmune/Connective tissue diseases
▪ Unspecified maternal condition</td><td>▪ No maternal condition identified (healthy mother)</td></tr>
</table>

Annex 5: Format for the Minutes of the Stillbirth and Neonatal Death meeting (framework)

Date:

Time:

Venue:

Attendees:

S.No	Name	Designation	Attended/apologized

Case scheduled to be discussed in the Meeting:

PD Number.	Reported from	Reported cause of death	Date of death	Reviewer	Reviewer

Case 1:

PD Number:

Date of death:

Place of death:

Reported Cause of Death in the Perinatal Death Notification form:

Main Findings of the Committee:

Avoidable contributing factors:

S.No	Factors	Remarks
1.	**Family factors:**	
2.	**Medical team factor:**	
3.	**Health facility factors:**	

Cause of death after review (PM ICD classification)":

Overall assessment of care:

Recommendation to institutions:

Annex 6: Stillbirth and Neonatal Death Review Form

STILLBIRTH AND NEONATAL DEATH REVIEW FORM

Sultanate of Oman
Ministry of Health
Directorate General of Primary Health Care
Department of Woman & Child Health

Reporting Governorate: .....
Reporting Health Institution: .....
Type of Death
- ☐ Stillbirth
- ☐ Early Neonatal Death (First 7 days)
- ☐ Late Neonatal Death (8-28 days)

Case File Code:	Neonate Hospital Number:	Date of Death	Date of Notification:	Date of Case Review:
		_____/_____/_____	_____/_____/_____	_____/_____/_____

Demographic Information

Mother's Name	Mother's IP/OPD Number	Willayat:	Governorate:
Antenatal Care: ☐ Un-booked ☐ Booked	Name of Parent Institution:	ANC registration number:	Admission at:

Summary of the case:

Maternal Conditions / Risk Factors after review (Please select the most appropriate):
* based on ICD-PM Maternal Condition Group

M1: Complications of placenta, cord and membranes	M2: Complications of placenta, cord and membranes	M3: Other complications of labour and delivery 1
☐ Placenta praevia ☐ Other forms of placental separation and haemorrhage ☐ Placental dysfunction, infarction, insufficiency ☐ Fetal–placental transfusion syndrome ☐ Prolapsed cord / other compression of umbilical cord ☐ Chorioamnionitis ☐ Other complications of membranes	☐ Incompetent cervix ☐ Preterm rupture of membranes ☐ Oligohydramnios / polyhydramnios ☐ Multiple pregnancy ☐ Maternal death ☐ Malpresentation before labour ☐ Other complications of pregnancy	☐ Breech delivery and extraction ☐ Other malpresentation, malposition, and disproportion during labour and delivery ☐ Forceps delivery / vacuum extraction ☐ Caesarean delivery ☐ Precipitate delivery ☐ Preterm labour and delivery ☐ Other complications of labour and delivery

M4: Maternal medical and surgical conditions; noxious influences		M5: No maternal condition
☐ Pre-eclampsia / eclampsia ☐ Gestational hypertension ☐ Other hypertensive disorders ☐ Renal and urinary tract diseases ☐ Infectious and parasitic disease ☐ Circulatory and respiratory disease ☐ Nutritional disorders ☐ Injury ☐ Road traffic accident ☐ Surgical procedure ☐ Other medical procedures	☐ Maternal diabetes including gestational diabetes ☐ Maternal anaesthesia and analgesia ☐ Maternal medication ☐ Tobacco / alcohol / drugs of addiction ☐ Nutritional chemical substances ☐ Environmental chemical substances ☐ Sickle cell disease ☐ Rh isoimmunisation ☐ Autoimmune/Connective tissue diseases Unspecified maternal condition	No maternal condition identified (healthy mother)

Fetal and Neonatal Cause of death: (Please select the most appropriate cause):
* based on ICD-PM Fetal Condition Group

Antepartum:	Intrapartum:	Neonatal Death
☐ A1: Congenital malformations, deformations, and chromosomal abnormalities ☐ A2: Infection ☐ A3: Antepartum hypoxia ☐ A4: Other specified antepartum disorder ☐ A5: Disorders related to foetal growth ☐ A6: Fetal death of unspecified cause	☐ I1: Congenital malformations, deformations and chromosomal abnormalities ☐ I2: Birth trauma ☐ I3: Acute intrapartum event ☐ I4: Infection ☐ I5: Other specified intrapartum disorder ☐ I6: Disorders related to fetal growth ☐ I7: Intrapartum death of unspecified cause	☐ 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 birth weight and prematurity ☐ N10: Miscellaneous ☐ N11: Neonatal death of unspecified cause

Critical Delays and Modifiable Factors: (Please tick all that apply and add additional information as needed)

Factor	Reason / Comments / Additional Information
A. Family Factors	
☐ 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 / alcohol abuse	
☐ Attempted termination	
☐ Others	

B. Medical team factors	
□ Partograph was not used	
□ Necessary action was not taken	
□ Inappropriate action was not taken	
□ Iatrogenic delivery	
□ Delay in referral to higher facility	
□ Inadequate monitoring during labour	
□ Delay in calling for assistance	
□ Inappropriate discharge	
□ Lack of training	
□ Others (specify)	
C. Health facility factors	
□ Unavailability/shortage of Neonatal specialised staff	
□ Unavailability of operating theatre facilities	
□ Unavailability of resuscitation equipment	
□ Unavailability of Blood products	
□ Insufficient staff numbers	
□ Unavailability of anaesthetist	

Quality of Care	
Item / Parameter	**Comments**
□ Overall, there was good care	
□ Improvement in quality of care were identified, if these had been in place it would still have made no difference to the outcome	
□ Improvement in quality of care were identified, if these had been in place it may have made a difference to the outcome	
□ Non assessable	

Final ICD10 Code for Cause of Death:

Observations & Recommendations				
S. No	**Observation (modifiable factors)**	**Recommendation**	**Action by**	**Timeline**
1				
2				
3				

Reviewer Signature: ……
Date: ……..

Annex 7: Flowchart of the Stillbirth and Neonatal Death Surveillance and Review System in Oman

Stillbirth and Neonatal Death Surveillance and Review System in Oman

Perinatal Deaths (PD)

Still Birth (SB): *A foetus with a birth weight of 500 gm and above, with no sign of life (irrespective of gestational age). (Still Birth=Fetal Death)*
Early Neonatal Deaths (ENND): *Death of neonate within 7 days of life Late Neonatal Deaths (LNND): Death of a neonate between Day8 and 28. Although LNNDs are not included in perinatal mortality statistics, all neonatal deaths should be reported within 24 hours.*

Reporting institution of PD:

- ❑ **Attending doctor (Obs/Gyn, pediatrician, medical doctor)** to notify case using **STILLBIRTH AND NEONATAL DEATH NOTIFICATION FORM** within 24 hours.
- ❑ **Staff nurse in-Charge of Delivery Suit/ SCBU/Pediatric ward** to send copy of form to Health Information and Statistics Department (HIS) at hospital each week.

Health Information and Statistics Department at the Hospital

- ❑ Send reported forms to regional HIS section.
- ❑ Send copy of form to Woman & Child Health Section (WCH) at governorate.
- ❑ Maintain one copy of forms at institution.

WCH - All Governorates

- ❑ Ensure completion of reported notification forms.
- ❑ Maintain data in database
- ❑ Distribute case files to assigned reviewers within 15 days from receipt of death notification.
- ❑ Coordinate for monthly PD committee meetings.
- ❑ Follow up on implementation of PD Committee recommendations

HIS Department at Directorate General of Health Services (DGHS)

- ❑ Review received forms and check completeness.
- ❑ Record data in epi-info database.
- ❑ Send collected data to HIS Department at MOH-HQ.

Regional PD committee

- ❑ Develop action plan to execute committee recommendations
- ❑ Send recommendations to concerned health institutions.

Department of HIS, MOH-HQ

- ❑ Receive collected data from all Governorates.
- ❑ Check completeness of data.
- ❑ Record Data in a National Database.
- ❑ Analyze collected data and publish in annual health report.

Department of Woman and Child Health - MOH-HQ

- ❑ Review completeness of reported data.
- ❑ Distribute case files to assigned national reviewers.
- ❑ Coordinate meeting for National PD committee.

National PD committee

- ❑ Conduct National PD Review of 25% of reported cases Suggest review of a sample of cases – could be a percentage OR a theme e.g. stillbirths at term,

NOTE: ***White copy (original):*** *Governmental head of WCH section;* ***Green copy:*** *To be kept at institution:* ***Pink copy:*** *To be sent to HIS Dept. at*