Review of and classification of causes of perinatal death (ICD-PM)

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Outline

• Global status of perinatal health
• Initiatives to improve perinatal health
• Definitions
• What is perinatal audit and why is it important?
• ICD-PM
• Next steps
The burden of stillbirths

- 2.6 million stillbirths every year
  - 98% in LMIC
  - 75% in Sub-Saharan Africa and Asia

- The intrapartum period account for 50% of all stillbirths

- Psychosocial burden
  - 4.2 million women with depression and following a stillbirth
  - Stigma and taboo complicates further the grief

- Economic impact on women and families after a stillbirth
Burden of neonatal deaths

- 2.5 million (2017)
- Global neonatal mortality rate (NMR) 18 per 1,000 live births
- 40% of all neonatal deaths occur around the time of birth

Almost all stillbirths and half of all neonatal deaths do not receive a birth certificate
Audit of stillbirths and neonatal deaths as a strategy

- ENAP objectives
  - Addresses quality of care around the time of birth
  - Generates data for decision making and action
  - Targets for stillbirths and neonatal deaths by 2030

- Sustainable development Goals (SDG)
  - Tracking progress towards target NMR 12 or less per 1,000 live births

- Accountability of women and children’s health
  - Commission on information and accountability (CoIA)
  - New Global Strategy for Women’s, Children’s and Adolescent’s Health 2.0
What has been the problem with perinatal deaths?

- Accurately capture and classify perinatal deaths is critical
  - A global definition urgently needed!

- Perinatal death classifications systems are too many
  - 81 different systems used globally for classifying perinatal death (2009)¹

- Need for a unifying and globally system broad enough to be applicable across different settings

- Numbers are high!
  - Recording in facilities a challenge!

WHO guides for audit and classification of perinatal deaths

- The WHO application of ICD-10 to deaths during the perinatal period
- Making Every Baby Count: Audit and Review of Stillbirths and Neonatal Deaths
- Response is critical to end preventable mortality!
Policy on notification and review of maternal deaths

Figure 3. Periodic progress in implementation of a national policy on notification of all maternal deaths in low- and middle-income countries

- 18 countries with a policy before 2000
- 43 countries with a policy in 2000–2009
- 52 countries with a policy in 2010
- 56 countries with a policy in 2011
- 60 countries with a policy in 2012
- 68 countries with a policy in 2013
- 77 countries with a policy in 2014
- 83 countries with a policy in 2015

Period/year

Note: Year information not reported for 6 countries with policy.

Figure 4. Periodic progress in implementation of a national policy to review all maternal deaths in low- and middle-income countries

- 19 countries with a policy before 2000
- 44 countries with a policy in 2000–2009
- 53 countries with a policy in 2010
- 58 countries with a policy in 2011
- 62 countries with a policy in 2012
- 68 countries with a policy in 2013
- 71 countries with a policy in 2014
- 76 countries with a policy in 2015

Period/year

Note: Year information not reported for 11 countries with the policy.
41 countries reported national policy on review of stillbirths
56 countries reported national policy on review of neonatal deaths
Definition of stillbirth

- Varying definitions over time and across settings.
- Stillbirths for international comparisons:
  - Birth weight of 1,000 grams or more
  - Gestational age of 28 weeks or greater
  - Body length of 35 cm or more
- National data
  - Birth weight of 500 grams or more
  - Gestational age of 22 weeks or greater
  - Body length of 25 cm or more
- 
  Stillbirth rate (SBR) is measured as a rate per 1,000 total births
Definition of neonatal death

- The neonatal period is the first 28 days of life
- Neonatal death (0-28 days)
  - Day 1 (first 24 hours of life)
  - Early (1-7 days of life)
  - Late (8-28 days of life)

- Neonatal mortality rate (NMR) is measured as a rate per 1,000 live births
- Perinatal mortality rate is the number of stillbirths and early neonatal deaths per 1,000 births
Black box mentality...
What is audit of stillbirths and neonatal deaths?

- A process of collectively reviewing all available information about a stillbirth or a neonatal death
  - Document the direct causes of death
  - Identify **modifiable** factors to prevent future, similar deaths
  - Identify, assign, and schedule actions to address modifiable factors

- Multidisciplinary approach

- Non-blaming, non-punitive – to identify system failures

- Produces better data, increased awareness and fewer perinatal deaths
Better information for better health

- Mortality estimates help to highlight the magnitude of the problem
- Need more information to plan actions:
  - Who died?
  - Where did they die?
  - When did they die?
  - Why did they die?
  - What can be done to prevent similar deaths?
Relationship between mortality audit and wider quality of care and CRVS systems

Mortality audit cycle

- Respond with action
  Improved quality of service delivery and outcomes

- Identify deaths
  Increased CRVS coverage

- Report deaths
  Ability to track mortality trends

- Review deaths
  Use of objective measures of quality care
What are the aims of the Making Every Baby Count guide?

• To establish a framework to assess:
  • Burden of stillbirths and neonatal deaths
  • Causes of death
  • Trends in number and causes of death

• Generate information on modifiable factors contributing to stillbirths and neonatal deaths to guide action

• Provide accountability for results

• Making stillbirths and neonatal deaths visible to decision-makers
1. Identify perinatal deaths
2. Collect information
3. Analyse results
4. Recommend solutions
5. Implement recommendations
6. Evaluate and refine
Preparation for stillbirth and neonatal death review: participants

• Review what is already in place and build on that

• **Who should be involved?** Multiple disciplines needed to organize and conduct meetings:
  • Midwives
  • Obstetricians and paediatricians
  • Facility administrators
  • Community liaisons
  • Public health specialists
  • At least two people to collect data in advance for the review meeting

• **Who should **not** be involved?**
  • The legal system or disciplinary bodies: need a separate unlinked process
  • Focus should be on improving the system and not blaming the individuals

• Meeting code of practice
Step 1: Identifying cases

- Identify sources for information:
  - Where are deaths likely to occur in my facility?
  - Are all the records housed in one location or are they found in different places across the facility?
    - Hospital registers (delivery, postnatal and neonatal, wards, operating theatre, paediatric ward for late neonatal deaths)
  - CRVS systems

- Create a list of all stillbirths and neonatal deaths in a facility to improve capturing perinatal deaths for review

Goal: Identify all births and deaths to feed into the minimal perinatal dataset
Minimum perinatal data set

- Ensures all birth outcomes are collected
- In a register or HMIS system

Minimum set of indicators:

- Maternal age
- Place of delivery
- Mode of delivery
- Birth weight
- Gestational age
- Birth outcome
Step 2: Collecting information

- Ideally, review within a week of the event
- Paper forms or computerized data entry programs
- Necessary data to be used for analysis
- Data verification
- All additional information that can create a richer understanding of delays and modifiable factors
Background and contextual information

Socio-demographic status

Age, ethnicity, occupation, education, socioeconomic factors

Antenatal

Obstetric history, planned pregnancy, medical history, antenatal care given, hospitalisation, other barriers for care

Intrapartum

Date and onset of labour, rupture of membranes, place of labour start, monitoring during labour, date and time of onset of labour, delivery attendant, complications, status of the baby (sex, gestational age, birth weight, APGAR), immediate care, barriers and decision timeline

Postpartum

Feeding choice (date and time for first feed), date and time for onset of complications, reported awareness of problems barriers and decision timeline
Step 3: Analysing the information (I)

Strategies for selecting cases for review

Selecting cases for review - Will depend on the burden of maternal and perinatal mortality

- Review maternal and perinatal deaths together, if they occur at the same time

- If perinatal mortality burden is high:
  - Use a thematic approach (for instance only sepsis cases)
  - Only the deaths the first week of the month
  - Cases that are most probably preventable

Even reviewing ONE death can generate useful information and lessons learnt to prevent future similar deaths from happening
Step 3: Analysing the information (II)

Minimum indicators to follow over time:

- Number of vaginal deliveries
- Maternal deaths
- Antepartum and intrapartum stillbirths
- In-facility stillbirths
- Neonatal mortality rates

Quantitative and qualitative information

Geographical mapping

Analyses at different levels: Facility or individual cases

Modifiable factors
What are modifiable factors?

- Something that may have prevented death if a different course of action was taken
  - Identifies missed opportunities
  - Builds momentum for behaviour change
  - More than one modifiable factor associated with each death
  - Ability to designate modifiable factors depends on knowledge of the case and clinical knowledge

- Multiple methods for identifying modifiable factors
  - Root-cause analysis is a common method
  - Delay approach (the three delays – decision, reaching and receiving)
  - Level approach (family/patient, administration or provider)

Examining contributing factors is a priority in death audits!
Step 4: Recommending solutions

- Solutions should target actionable problems, factors, causes and sub-causes

- Solutions should always be **SMART**:
  - Specific
  - Measurable
  - Appropriate
  - Relevant
  - Time-bound

- Possible actions include interventions in the facility, community, linked health services or the public sector.

- Dissemination of audit findings with key message to those who can implement change: MOH, planners, Professional organisations, Academic institutions, CSOs

- Periodic report in a simple language with findings and solutions
Step 5: Implementing changes

- Actions with different time frames
- Assign actions to team members of the committee
  - Who?
  - What?
  - By when?
- Leadership is important!

The whole purpose of the action cycle!
Step 6: Evaluating and refining

• How efficient is the system in identifying and reviewing deaths?

• How effective is the system in institutionalising beneficial practices?
  • Document changes over time, through annual review meeting or report helps identify gaps and areas of success.
  • Periodic evaluation of the system improvements
  • Periodic evaluation of the inequality of the information captured
Dimensions of a phased introduction of mortality audits for perinatal deaths
Do perinatal audits work?

- Perinatal mortality decreased in Norway from 13.8 to 7.7 with better cooperation between hospitals and implementation of national protocols attributed to the audit process
  - Bergsjo et al. 2003
- Introduction of perinatal audits in middle and low income countries associated with 30% reduction in mortality
  - Pattinson et al, 2009
- Decrease in substandard care and mortality after introduction of perinatal audits in 90 Dutch hospitals
  - Eskes et al 2016
Reduced mortality does not necessarily follow death audits

- The Perinatal Problem Identification Program (PPIP)
- Quality-of-care improvement audit starting in 1990
- Voluntary until 2012
- 94% of all hospitals and 73% of all births: all levels of care
- Results (163 facilities) in perinatal mortality:
  - 29% lower
  - 32% increased
  - 39% no change

The WHO application of ICD-10 to deaths during the perinatal period

ICD-PM
Purpose of the ICD-PM and time period for application

• Aims to facilitate the consistent collection, analysis and interpretation of information on perinatal deaths.

• Actionable information for programming.

• Timing of death important: for all antepartum, intrapartum and early neonatal deaths (during the first 7 days of life).

• It can also be used for late neonatal deaths (before 28 completed days of life).

• Need to emphasize the mother-baby dyad
Features of ICD-PM

A three step process…

1. Timing
2. Perinatal cause of death
3. Maternal condition contributing to death

• Separates perinatal deaths by timing of death:
  • Antenatal, intrapartum and early neonatal

• Applies cause of death using logically grouped ICD-10 codes
  • Re-organized, user-friendly and relevant across settings (multi-layered)

• Ensures the maternal condition is always captured
  • Related to the perinatal death causal pathway
# ICD-PM groups - Antenatal deaths

<table>
<thead>
<tr>
<th></th>
<th>ANTENATAL DEATH</th>
<th>ICD-10 codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Congenital malformations, deformations and chromosomal abnormalities</td>
<td>Q00-Q99</td>
</tr>
<tr>
<td>A2</td>
<td>Infection</td>
<td>P35, P37, P39</td>
</tr>
<tr>
<td>A3</td>
<td>Antepartum hypoxia</td>
<td>P20</td>
</tr>
<tr>
<td>A4</td>
<td>Other specified antepartum disorder (Including codes specific to the antenatal period from haemorrhagic and haematological disorders of fetus and newborn)</td>
<td>P50, P52, P55, P56, P60, P61, P70, P75, P77, P83, P96.4</td>
</tr>
</tbody>
</table>
# ICD-PM group - Intrapartum deaths

<table>
<thead>
<tr>
<th>ICD-10 codes</th>
<th>INTRAPARTUM DEATH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q00-Q99</td>
<td>I1 Congenital malformations, deformations and chromosomal abnormalities</td>
</tr>
<tr>
<td>P10-P15</td>
<td>I2 Birth trauma</td>
</tr>
<tr>
<td>P20</td>
<td>I3 Acute intrapartum event</td>
</tr>
<tr>
<td>P35, P37, P39, A50</td>
<td>I4 Infection</td>
</tr>
<tr>
<td>P50, P52, P55, P56, P60, P61, P70, P96</td>
<td>I5 Other specified intrapartum disorder (Including codes specific to the intrapartum period from haemorrhagic and haematological disorders of fetus and newborn)</td>
</tr>
<tr>
<td>P05, P07, P08</td>
<td>I6 Disorders related to length of gestation and fetal growth</td>
</tr>
<tr>
<td>P95</td>
<td>I7 Intrapartum death of unspecified cause</td>
</tr>
<tr>
<td></td>
<td>NEONATAL DEATH</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>N1</td>
<td>Congenital malformations, deformations and chromosomal abnormalities</td>
</tr>
<tr>
<td>N2</td>
<td>Disorders related to fetal growth</td>
</tr>
<tr>
<td>N3</td>
<td>Birth trauma</td>
</tr>
<tr>
<td>N4</td>
<td>Complications of intrapartum events</td>
</tr>
<tr>
<td>N5</td>
<td>Convulsions and disorders of cerebral status</td>
</tr>
<tr>
<td>N6</td>
<td>Infection</td>
</tr>
<tr>
<td>N7</td>
<td>Respiratory and cardiovascular disorders</td>
</tr>
<tr>
<td>N8</td>
<td>Other neonatal conditions</td>
</tr>
<tr>
<td></td>
<td>(Including codes specific to the neonatal period from haemorrhagic and</td>
</tr>
<tr>
<td></td>
<td>haematological disorders of fetus and newborn, transitory endocrine and</td>
</tr>
<tr>
<td></td>
<td>metabolic disorders specific to fetus and newborn, digestive system disorders</td>
</tr>
<tr>
<td></td>
<td>of fetus and newborn, conditions involving the integument and temperature</td>
</tr>
<tr>
<td></td>
<td>regulation of fetus and newborn, other disorders originating in the perinatal</td>
</tr>
<tr>
<td></td>
<td>period)</td>
</tr>
<tr>
<td>N9</td>
<td>Low birth weight and prematurity</td>
</tr>
<tr>
<td>N10</td>
<td>Miscellaneous</td>
</tr>
<tr>
<td>N11</td>
<td>Neonatal death of unspecified cause</td>
</tr>
</tbody>
</table>
## ICD-PM groups - Maternal condition

<table>
<thead>
<tr>
<th>MATERNAL CONDITION</th>
<th>ICD-10 codes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M1</strong> Complications of placenta, cord and membranes</td>
<td>P02</td>
</tr>
<tr>
<td><strong>M2</strong> Maternal complications of pregnancy</td>
<td>P01</td>
</tr>
<tr>
<td><strong>M3</strong> Other complications of labour and delivery</td>
<td>P03</td>
</tr>
<tr>
<td><strong>M4</strong> Maternal medical and surgical conditions</td>
<td>P00</td>
</tr>
<tr>
<td><strong>M5</strong> No maternal condition identified</td>
<td></td>
</tr>
<tr>
<td><strong>M6</strong> Other</td>
<td></td>
</tr>
</tbody>
</table>
Next steps....

- Developing “operational guidance” to support implementation of MPDSR
- Training materials
  - E-training materials (in collaboration with PAHO colleagues) with certification possibilities
- Step by step guide
- Checklists and other implementation tools
- Instructional videos
- Potential – Mobile App for assigning cause of death
- Monitoring framework
- Pilot test planned for Fall 2018
More information...

The WHO application of ICD-10 to deaths during the perinatal period: ICD-PM


Making Every Baby Count: Audit and review of stillbirths and neonatal deaths

Video clips to download introducing Making Every Baby Count and ICD-PM

**ENGLISH**

Introduction to Making Every baby Count: Audit and Review of Stillbirths and Neonatal Deaths

https://youtu.be/cZ6L53EYXgQ

Introduction to The WHO application of ICD-10 codes to the perinatal period: ICD-PM

https://youtu.be/f1bZoOdjZyU

Recommendations on Setting up a review committee

https://youtu.be/aus5n0qQFgk

**FRENCH**

Introduction to Making Every baby Count: Audit and Review of Stillbirths and Neonatal Deaths

https://youtu.be/iboWJcuEqXI

Introduction to The WHO application of ICD-10 codes to the perinatal period: ICD-PM

https://youtu.be/FGTyYfyP8LY

Recommendations on Setting up a review committee

https://youtu.be/9dcJE0-qGTI
Useful links on ICD-PM

Giving a voice to millions: developing the WHO application of ICD-10 to deaths during the perinatal period: ICD-PM [link](http://onlinelibrary.wiley.com/doi/10.1111/1471-0528.14243/full)

The WHO application of ICD-10 to deaths during the perinatal period: ICD-PM: results from pilot database testing in South Africa and United Kingdom

[link](http://onlinelibrary.wiley.com/doi/10.1111/1471-0528.14244/full)

Application of ICD-PM to preterm-related neonatal deaths in the UK and South Africa

[link](http://onlinelibrary.wiley.com/doi/10.1111/1471-0528.14245/full)

Optimizing the International Classification of Diseases to identify the maternal condition in the case of perinatal death

[link](http://onlinelibrary.wiley.com/doi/10.1111/1471-0528.14246/full)
Thank you!
Group work - Instructions

1. There are 4 cases that you will review

2. Assign cause of death using ICD-10 codes logically grouped according to the ICD-PM guide.

3. Assign the corresponding ICD-PM code and tabulate in the table on page 3 (this will give you the corresponding ICD-PM code)

4. All the ICD-10 codes can be found on pages 4 and 5.

5. The ICD-PM codes can be found on page 3
Case 1: Neonatal death

19 year old para 1

Certain gestation of 38 weeks based on early clinical examination.

Presented as a healthy mother with no significant previous history. A 2450gr baby was delivered after an 8 hour labor. An early neonatal death on day two of life from meconium aspiration syndrome

Factors that are potentially modifiable identified by clinical review of the case were fetal distress not detected in labor and personnel too junior to manage the patient.
# Case 1: Neonatal death

<table>
<thead>
<tr>
<th>Causes of death</th>
<th>Clinical details</th>
<th>ICD-10 code</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Main disease or condition in fetus or infant</td>
<td>Meconium aspiration syndrome</td>
<td>P24.0</td>
</tr>
<tr>
<td>(b) Other diseases of conditions in fetus or infant</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

| (c) Main maternal disease or condition affecting fetus or infant | No maternal condition |
| (d) Other maternal diseases or conditions affecting fetus or infant | |

**Final ICD-PM groups**: N7; M5
Case 1

ICD-PM code N7;M5
<table>
<thead>
<tr>
<th>Frame A: Medical data: Part 1 and 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Report disease or condition directly leading to death on line a.</td>
</tr>
<tr>
<td>Cause of death:</td>
</tr>
<tr>
<td>Time interval from onset to death</td>
</tr>
<tr>
<td>2. Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frame B: Other medical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was surgery performed within the last 4 weeks?</td>
</tr>
<tr>
<td>If yes please specify date of surgery</td>
</tr>
<tr>
<td>If yes please specify reason for surgery (disease or condition)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WHO death certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main disease or condition in the mother</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fetal or Infant Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple pregnancy</td>
</tr>
<tr>
<td>Stillborn?</td>
</tr>
<tr>
<td>If death within 24h specify number of hours survived</td>
</tr>
<tr>
<td>Birth weight (in grams)</td>
</tr>
<tr>
<td>Age of mother (years)</td>
</tr>
</tbody>
</table>

For women, was the deceased pregnant? At time of death: | Yes | No | Unknown |
| Between 42 days before death: | Yes | No | Unknown |
| Did the pregnancy contribute to the death? | Yes | No | Unknown |
Case 2: Fetal death

36 year old para 5

35 weeks of gestation by clinical palpation

Presented with complaints of headache and decreased fetal movements.

A fetal death in utero was diagnosed. Clinical and biochemical investigation revealed maternal proteinuric hypertension. Spontaneous vaginal delivery of a macerated 2100gr stillborn followed induction of labor. The proteinuric hypertension subsequently resolved. The antepartum cause of death is intrauterine hypoxia, and the maternal condition is pre-eclampsia.
**Case 2: Fetal death**

<table>
<thead>
<tr>
<th>Causes of death</th>
<th>Clinical details</th>
<th>ICD-10 code</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Main disease or condition in foetus or infant</td>
<td>Intrauterine hypoxia</td>
<td>P20.0</td>
</tr>
<tr>
<td>(b) Other diseases of conditions in foetus or infant</td>
<td>Prematurity</td>
<td>P07.3</td>
</tr>
<tr>
<td>(c) Main maternal disease or condition affecting foetus or infant</td>
<td>Pre-eclampsia</td>
<td>P00.0</td>
</tr>
<tr>
<td>(d) Other maternal diseases or conditions affecting foetus or infant</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Final ICD-PM groups: A3; M4**

This case highlights the need to always capture the maternal condition, as the fetal cause of death of intrauterine hypoxia provides less specific information than the maternal condition of pre-eclampsia.
Case 2

ICD-PM code A3;M4

<table>
<thead>
<tr>
<th>Perinatal cause of death</th>
<th>Antepartum death (A)</th>
<th>Intrapartum death (I)</th>
<th>Neonatal death (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A1: Congenital malformations, deformations and chromosomal abnormalities</td>
<td>I1: Congenital malformations, deformations and chromosomal abnormalities</td>
<td>N1: Congenital malformations, deformations and chromosomal abnormalities</td>
</tr>
<tr>
<td></td>
<td>A2: Infection</td>
<td>I2: Birth Trauma</td>
<td>N2: Disorders related to fetal growth</td>
</tr>
<tr>
<td></td>
<td>A3: Antepartum hypoxia</td>
<td>I3: Acute intrapartum event</td>
<td>N3: Birth Trauma</td>
</tr>
<tr>
<td></td>
<td>A4: Other specified antepartum disorder</td>
<td>I4: Infection</td>
<td>N4: Complications of intrapartum events</td>
</tr>
<tr>
<td></td>
<td>A5: Disorders related to fetal growth</td>
<td>I5: Other specified intrapartum disorder</td>
<td>N5: Convulsions and disorders of cerebral status</td>
</tr>
<tr>
<td></td>
<td>A6: Fetal death of unspecified cause</td>
<td>I6: Disorders related to fetal growth</td>
<td>N6: Infection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I7: Intrapartum death of unspecified cause</td>
<td>N7: Respiratory and cardiovascular disorders</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N8: Other neonatal conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N9: Low birth weight and prematurity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N10: Miscellaneous</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N11: Neonatal death of unspecified cause</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total [%]</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
A 16 year old para 0 with no medical history, presented in spontaneous labor at 29 certain weeks gestation subsequently had a forceps delivery of a live born baby weighing 1100gr.

The baby died on day 2 of life from hyaline membrane disease.

The neonatal cause of death is hyaline membrane disease with the maternal condition of spontaneous preterm labor.
## Case 3: Neonatal death

The final ICD-PM groups would be: N7; M3

This case highlights the need to identify a specific cause of neonatal premature death other than prematurity. In addition, although the mother had no medical history, the occurrence of spontaneous preterm labor is abnormal and so should be recorded as the main maternal condition contributing to the perinatal death.

### Causes of death

<table>
<thead>
<tr>
<th>Causes of death</th>
<th>Clinical details</th>
<th>ICD-10 code</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Main disease or condition in fetus or infant</td>
<td>• Hyaline membrane disease</td>
<td>P22.0</td>
</tr>
<tr>
<td>(b) Other diseases of conditions in fetus or infant</td>
<td>• Prematurity</td>
<td>P07.1</td>
</tr>
<tr>
<td>(c) Main maternal disease or condition affecting fetus or infant</td>
<td>• Spontaneous preterm labour</td>
<td>P03.8</td>
</tr>
<tr>
<td>(d) Other maternal diseases or conditions affecting fetus or infant</td>
<td>• Forceps delivery</td>
<td>P03.2</td>
</tr>
</tbody>
</table>
Case 3

ICD-PM code N7;M3