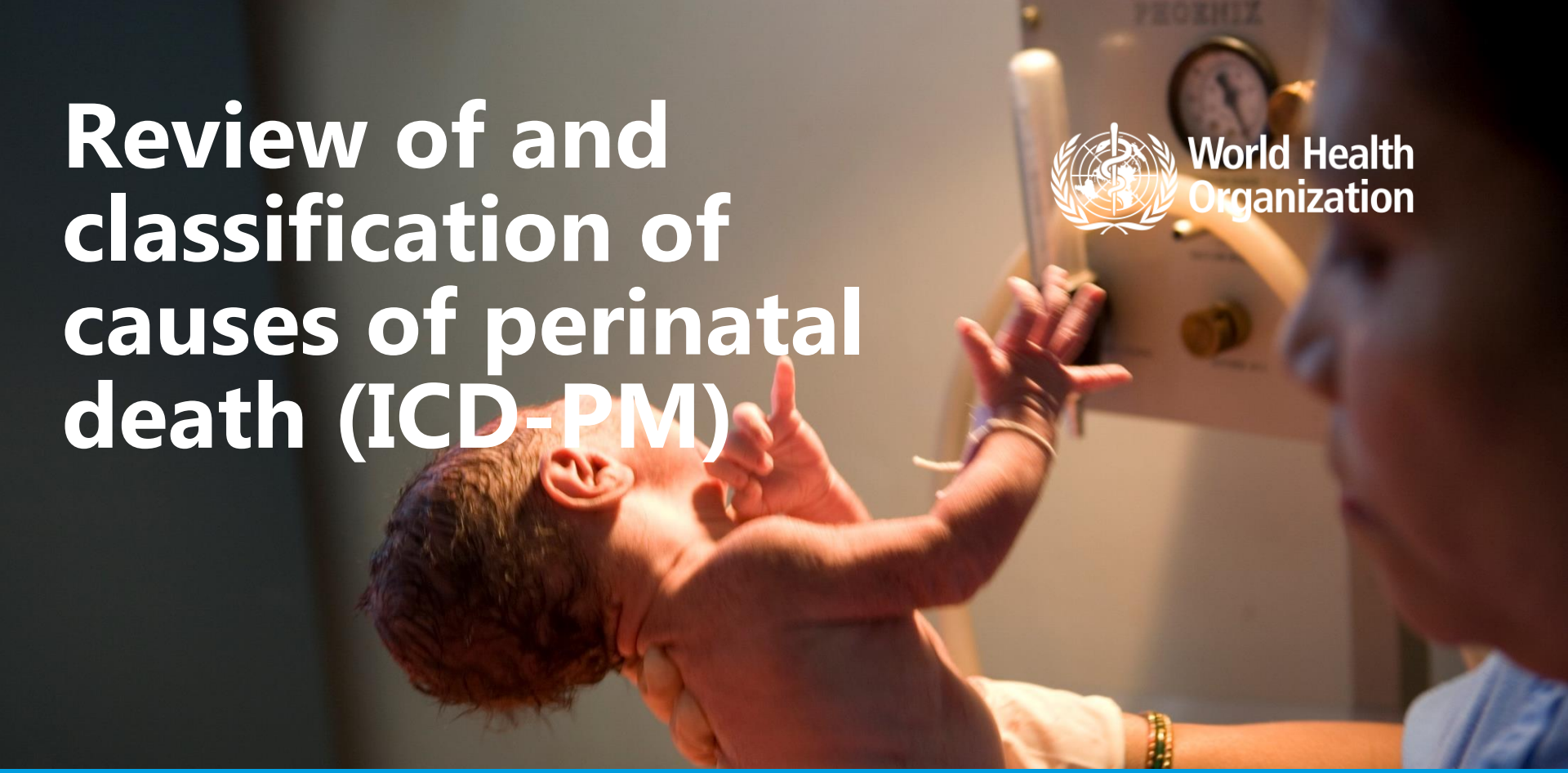
Review of and classification of causes of perinatal death (ICD-PM)

World Health Organization



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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

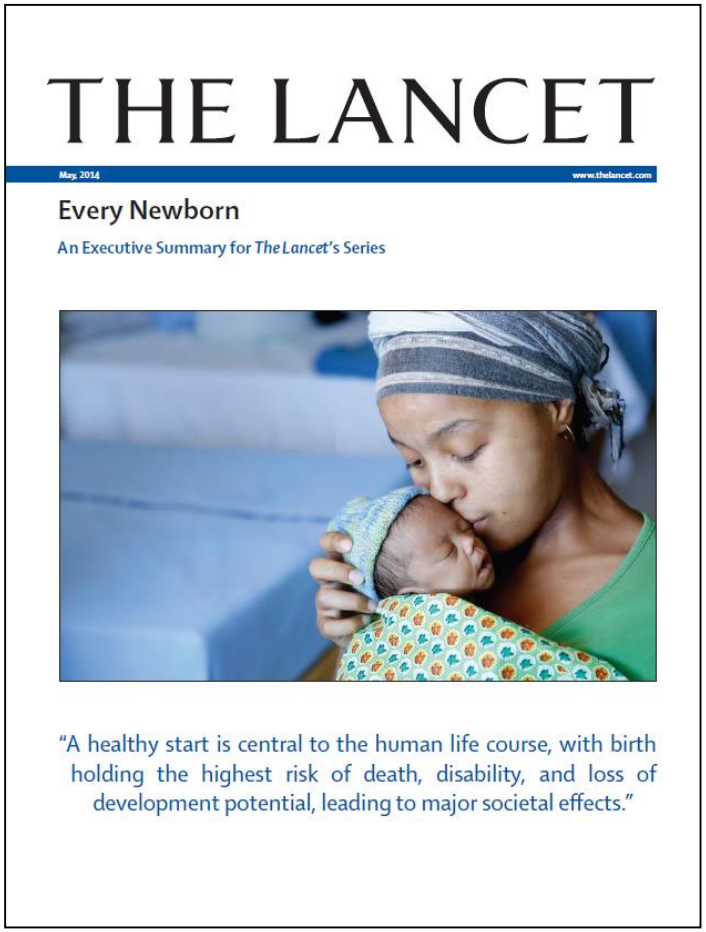
The burden of stillbirths

- 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

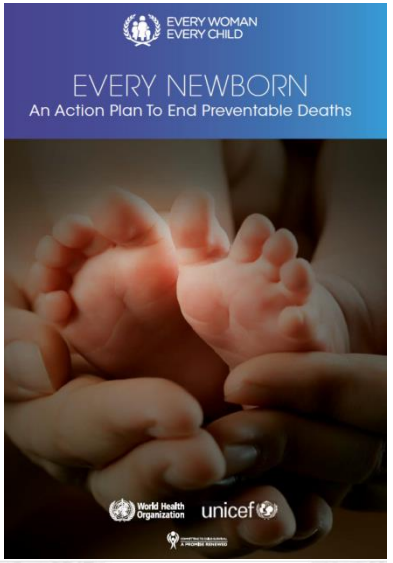
- 2.5 million (2017)
- Global neonatal mortality rate (NMR) 18 per 1,000 live births
- 40% of all neonatal deaths occur around the time of birth

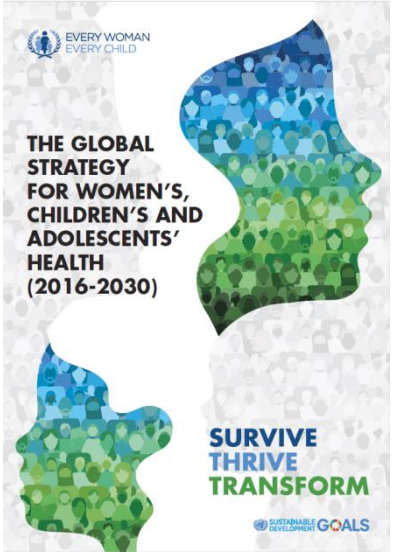
Almost all stillbirths and half of all neonatal deaths do not receive a birth certificate



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





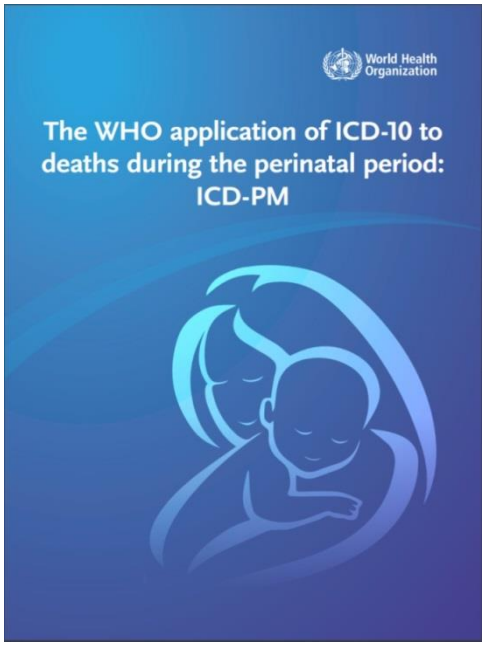
What has been the problem with perinatal deaths?

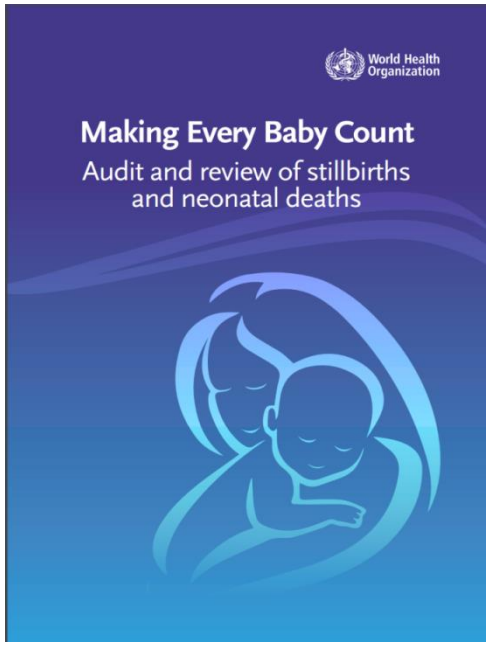
- Accurately capture and classify perinatal deaths is critical
  - A global definition urgently needed!
- Perinatal death classifications systems are too many
  - 81 different systems used globally for classifying perinatal death (2009)[1]
- Need for a unifying and globally system broad enough to be applicable across different settings
- Numbers are high!
  - Recording in facilities a challenge !

Refernce: 1 Leisher SH, Teoh Z, Reinebrant H, et al. Seeking order amidst chaos: A systematic review of classification systems for causes of stillbirth and neonatal death, 2009-2014. BMC Pregnancy and Childbirth 2016

WHO guides for audit and classification of perinatal deaths

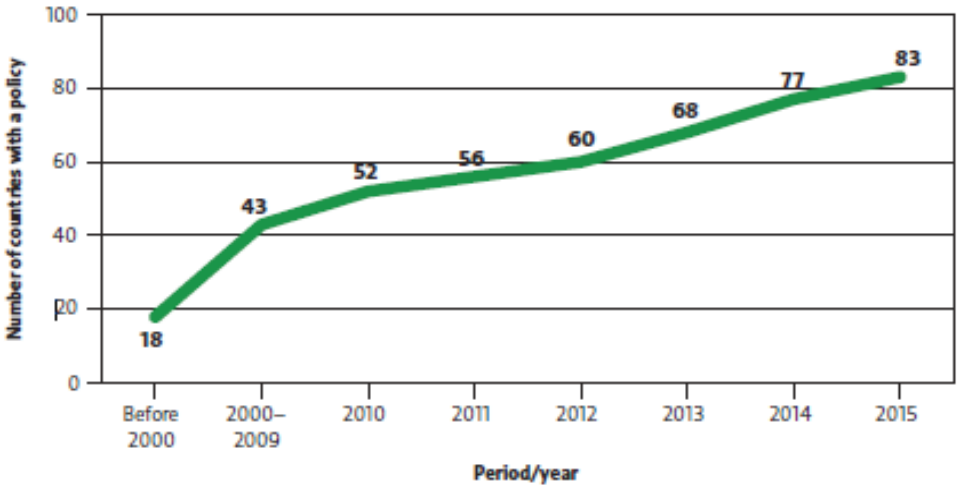
- The WHO application of ICD-10 to deaths during the perinatal period
- Making Every Baby Count: Audit and Review of Stillbirths and Neonatal Deaths
- Response is critical to end preventable mortality!





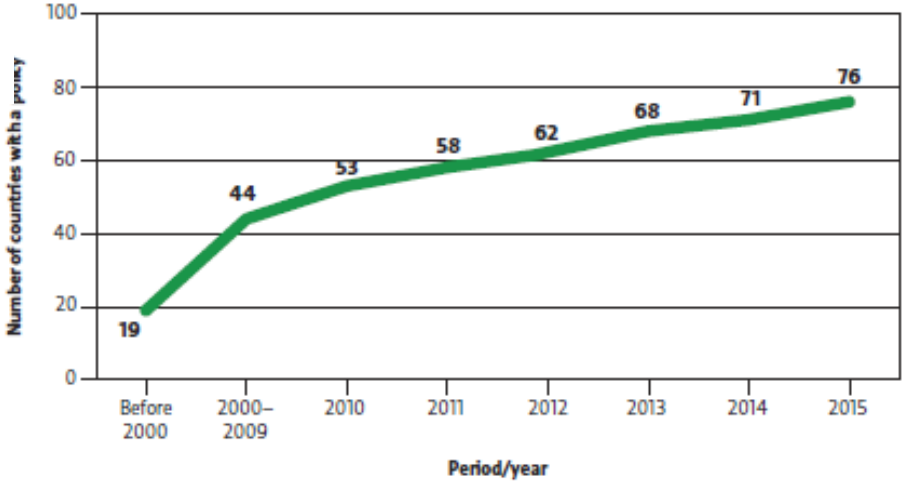
Policy on notification and review of maternal deaths

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



Note: Year information not reported for 6 countries with policy.
Source: WHO-UNFPA MDSR Baseline Survey 2015 and WHO MNCAH Policy Indicator Database 2014.

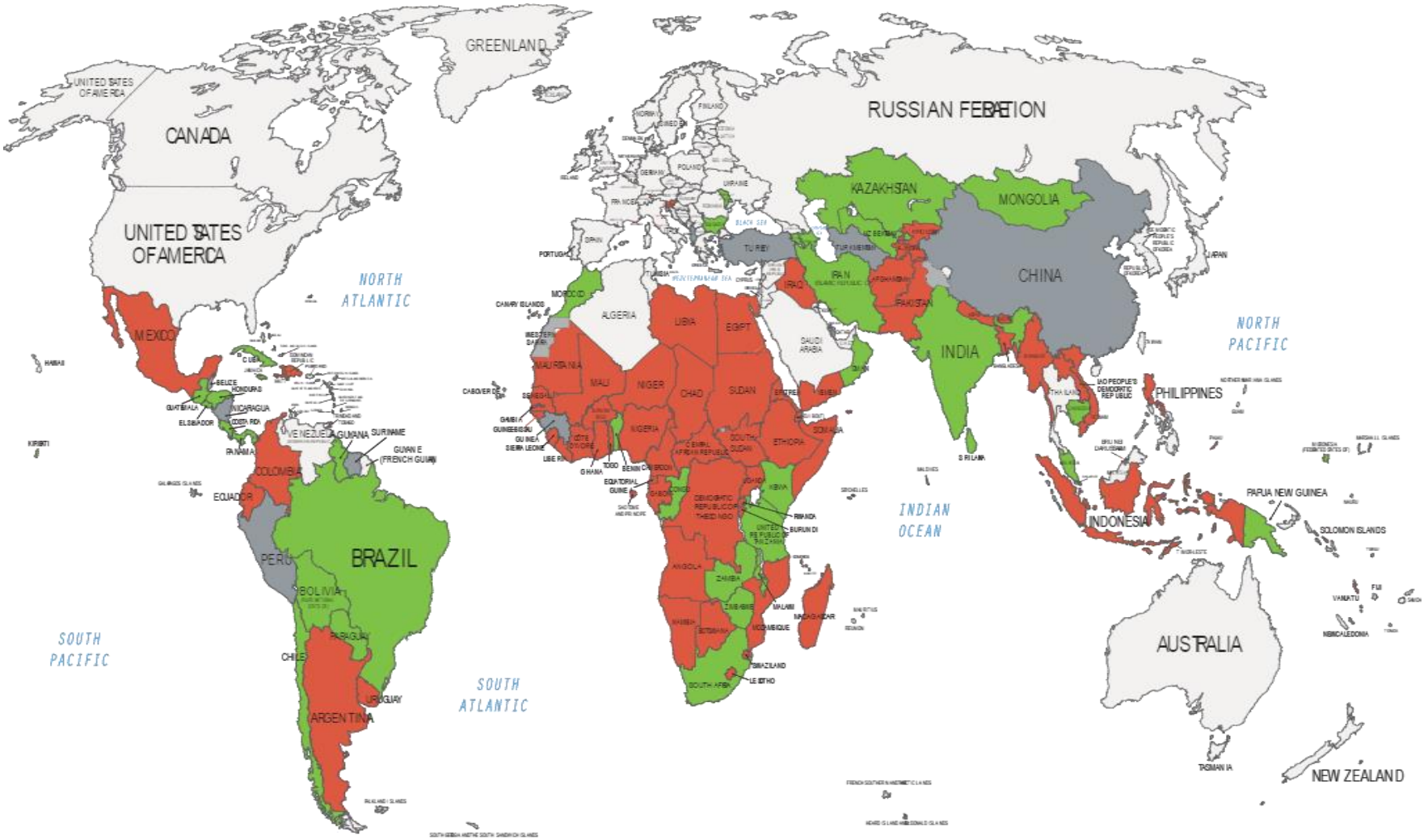
Figure 4. Periodic progress in implementation of a national policy to review all maternal deaths in low- and middle-income countries



Note: Year information not reported for 11 countries with the policy.
Source: WHO-UNFPA MDSR Baseline Survey 2015 and WHO MNCAH Policy Indicator Database 2014.

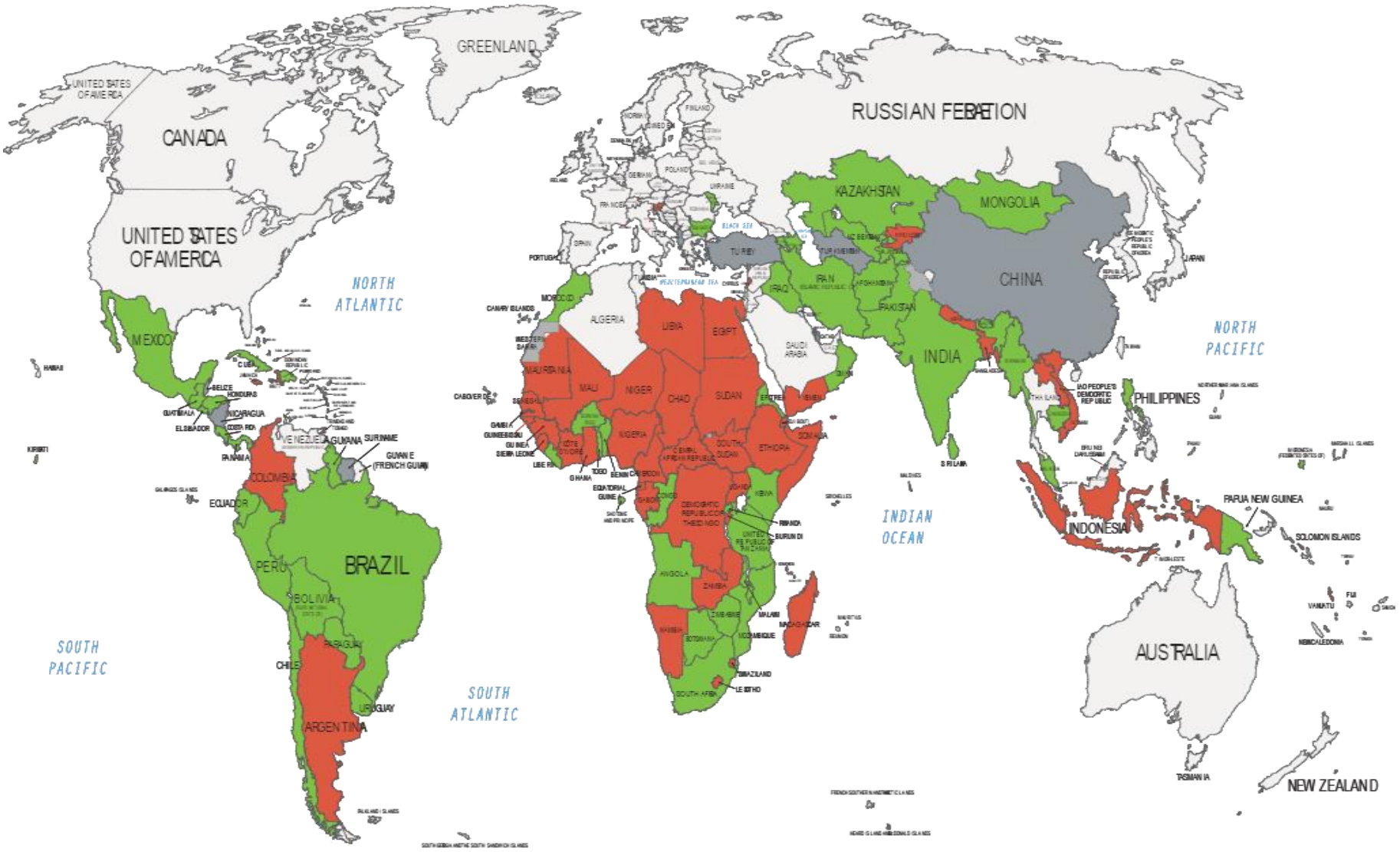
41 countries reported national policy on review of stillbirths

World Health Organization



56 countries reported national policy on review of neonatal deaths

World Health Organization



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)

→ **75% of all neonatal deaths**

- 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…

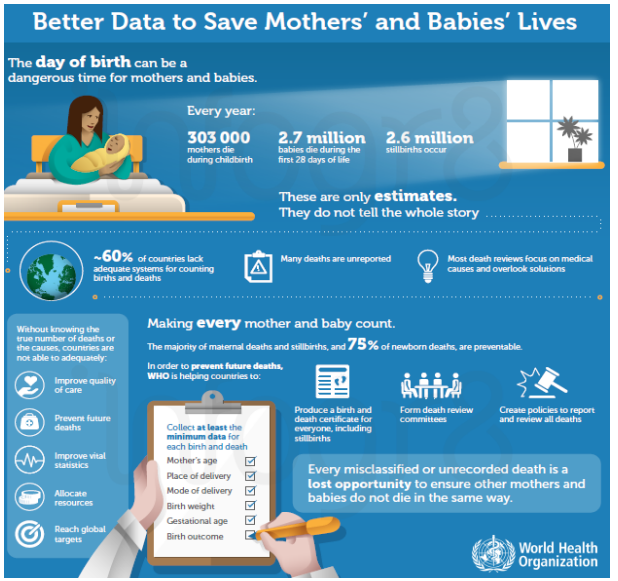
World Health Organization

What is audit of stillbirths and neonatal deaths?

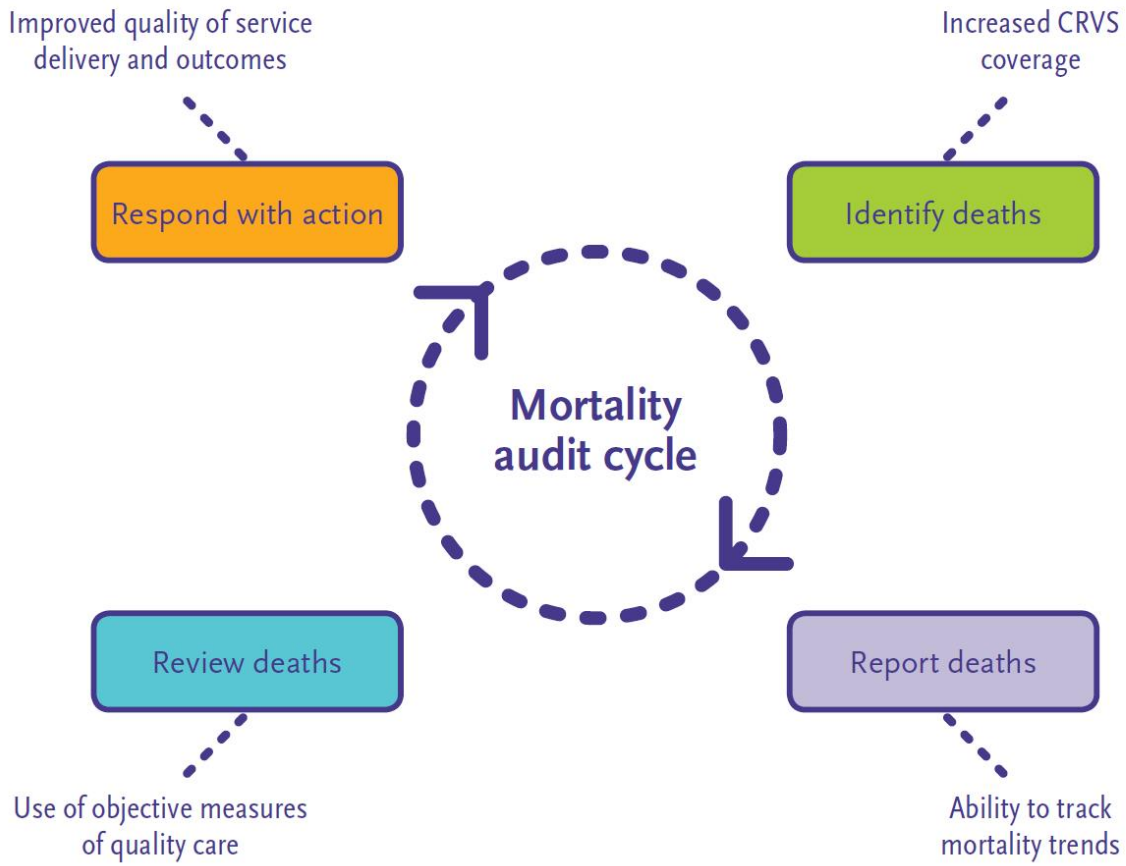
- A process of collectively reviewing all available information about a stillbirth or a neonatal death
  - Document the direct causes of death
  - Identify **modifiable** factors to prevent future, similar deaths
  - Identify, assign, and schedule actions to address modifiable factors
- Multidisciplinary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



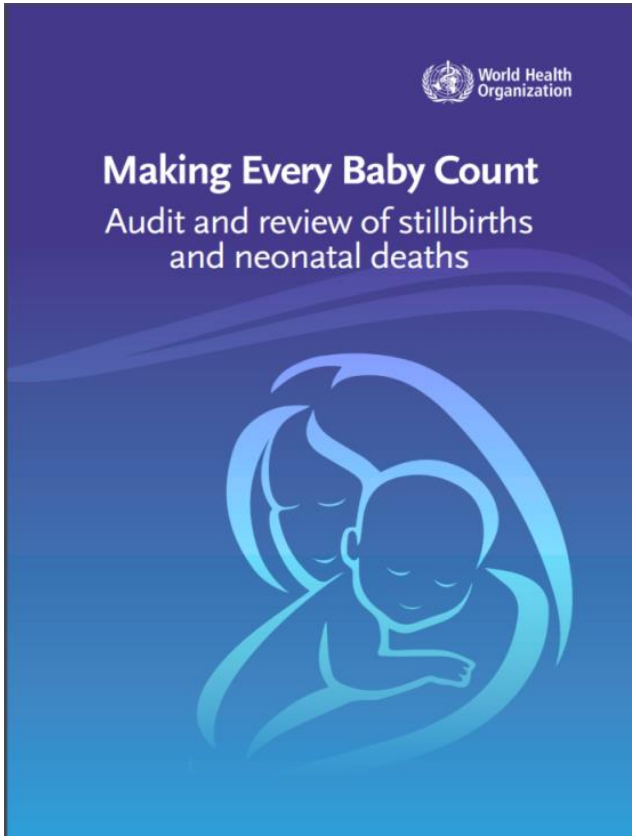
Relationship between mortality audit and wider quality of care and CRVS systems



What are the aims of the Making Every Baby Count guide?

World Health Organization

- 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



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1. Identify perinatal deaths

2. Collect information

3. Analyse results

4. Recommend solutions

5. Implement recommendations

6. Evaluate and refine

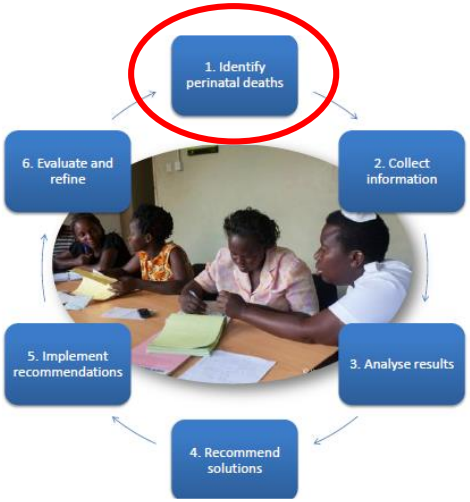
Preparation for stillbirth and neonatal death review: participants

- 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



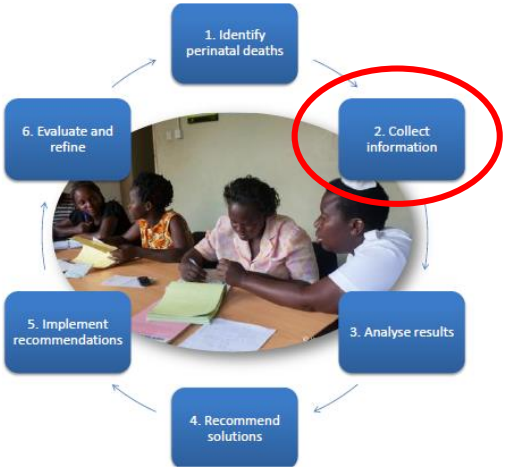
Goal: Identify <u>all</u> births and deaths to feed into the minimal perinatal dataset

Minimum perinatal data set

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

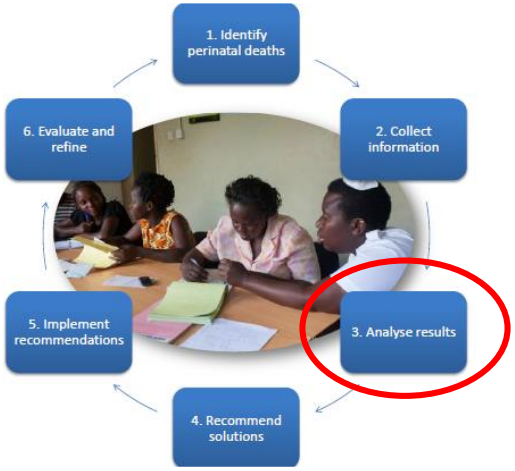
Postpartum

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

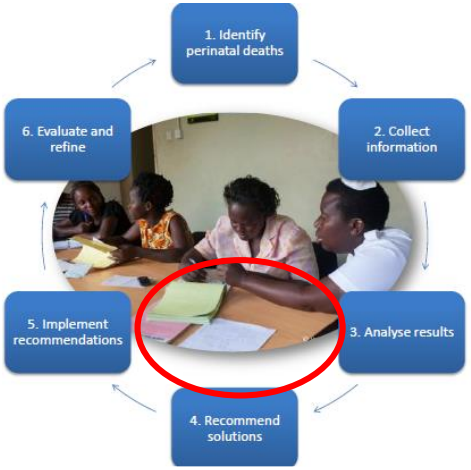
What are modifiable factors?

- 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!

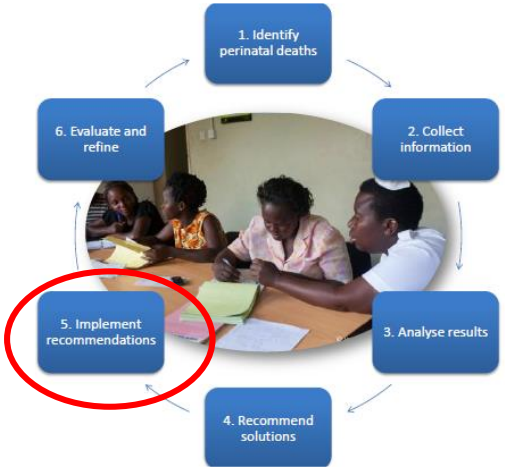
Step 4: Recommending solutions

- 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

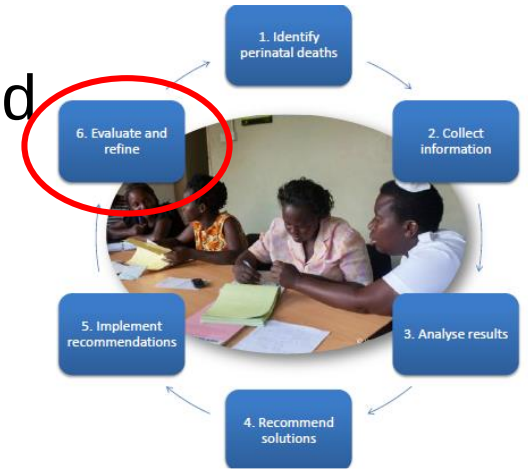
Step 5: Implementing changes



- 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!

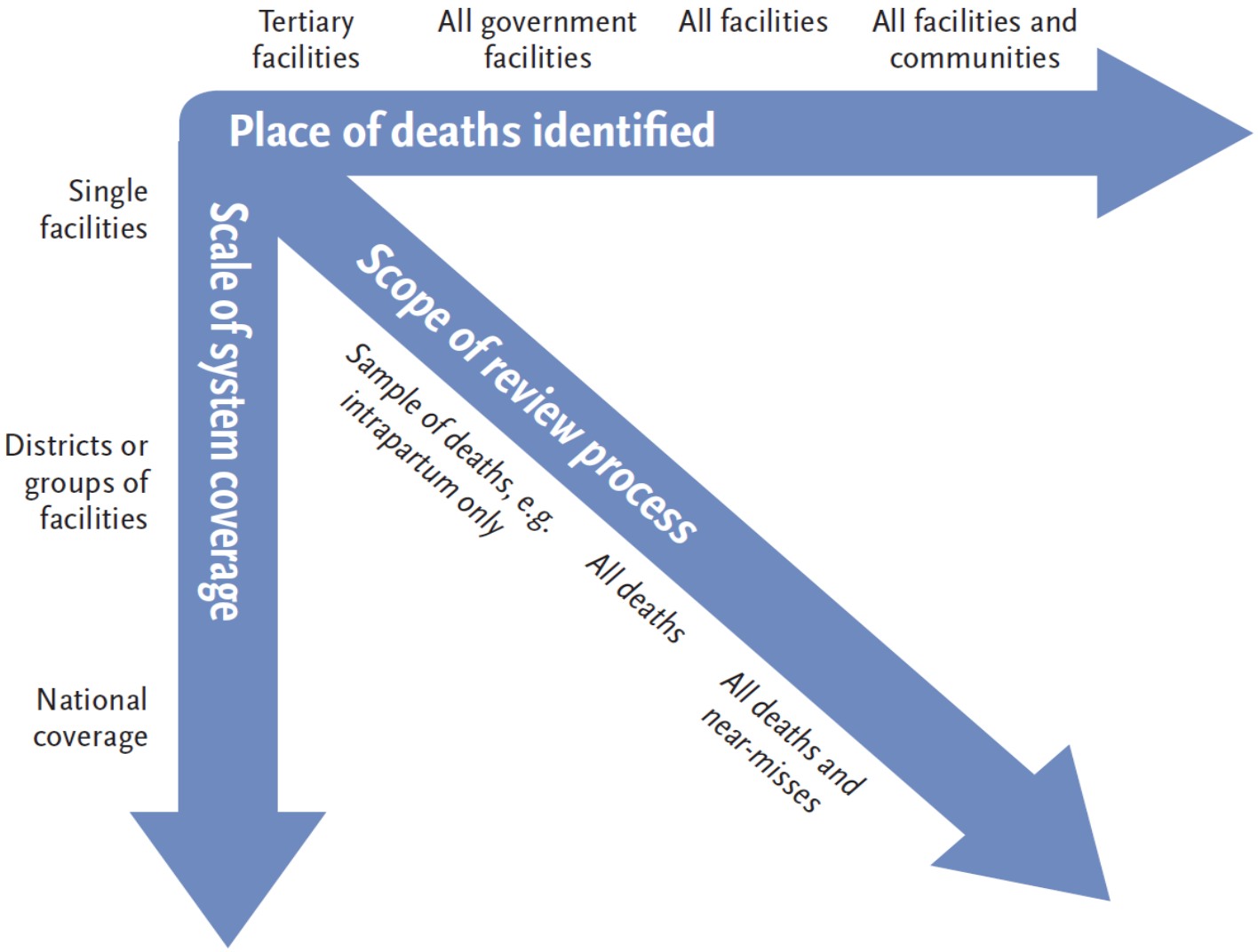
Step 6: Evaluating and refining



- 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

World Health Organization



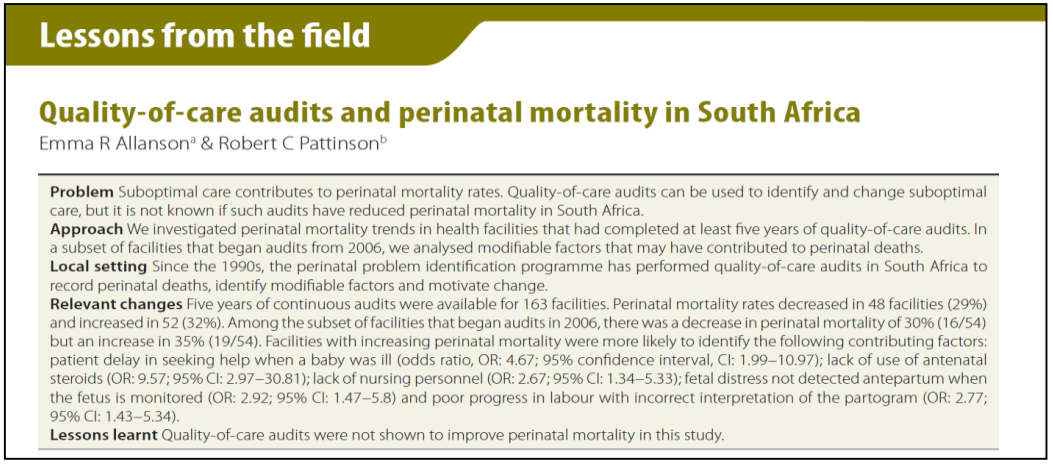
Do perinatal audits work?

- 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

World Health Organization

- 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



Lessons from the field

Quality-of-care audits and perinatal mortality in South Africa

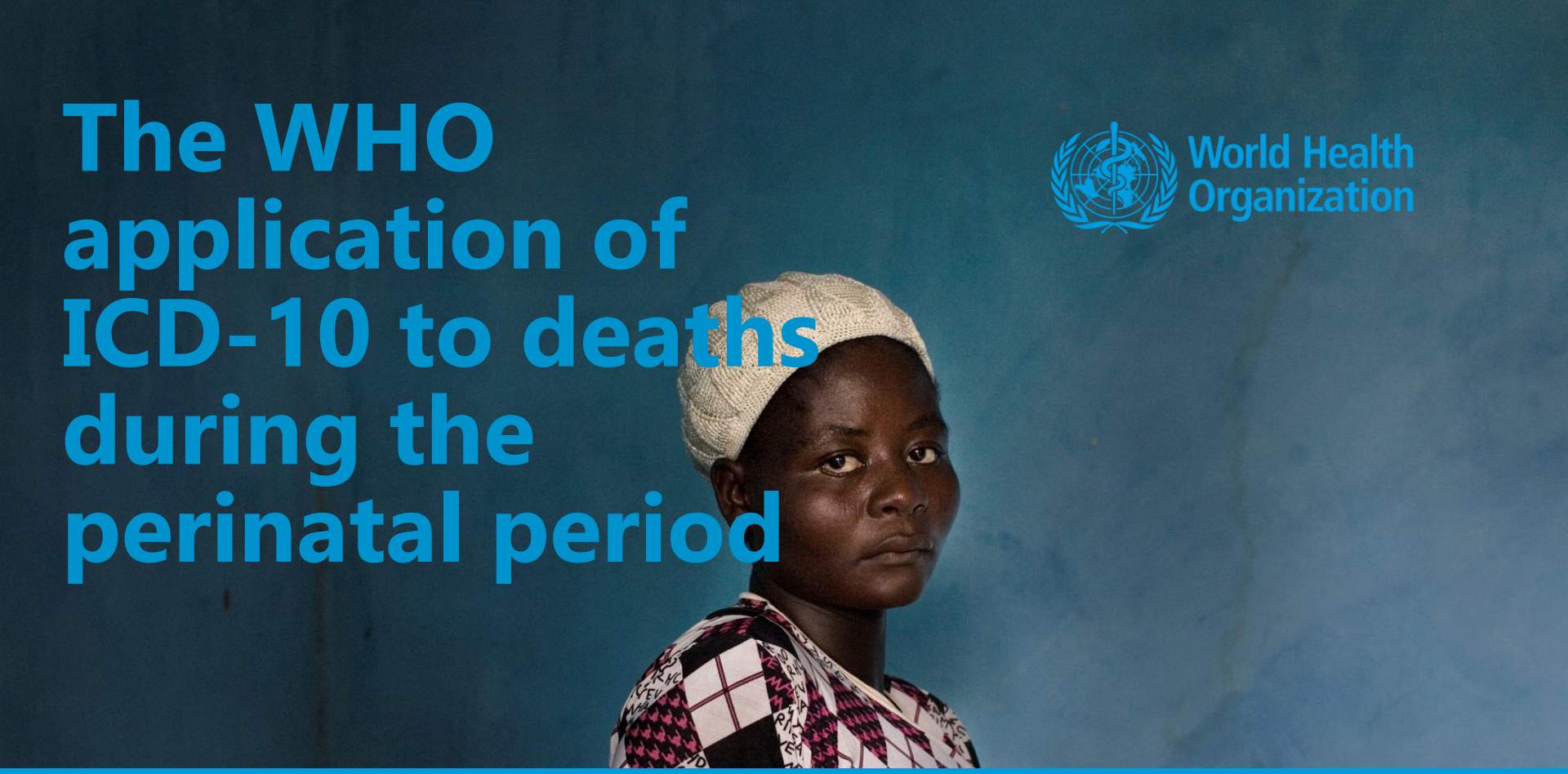
Emma R Allanson[a] & Robert C Pattinson[b]

Problem Suboptimal care contributes to perinatal mortality rates. Quality-of-care audits can be used to identify and change suboptimal care, but it is not known if such audits have reduced perinatal mortality in South Africa.
Approach We investigated perinatal mortality trends in health facilities that had completed at least five years of quality-of-care audits. In a subset of facilities that began audits from 2006, we analysed modifiable factors that may have contributed to perinatal deaths.
Local setting Since the 1990s, the perinatal problem identification programme has performed quality-of-care audits in South Africa to record perinatal deaths, identify modifiable factors and motivate change.
Relevant changes Five years of continuous audits were available for 163 facilities. Perinatal mortality rates decreased in 48 facilities (29%) and increased in 52 (32%). Among the subset of facilities that began audits in 2006, there was a decrease in perinatal mortality of 30% (16/54) but an increase in 35% (19/54). Facilities with increasing perinatal mortality were more likely to identify the following contributing factors: patient delay in seeking help when a baby was ill (odds ratio, OR: 4.67; 95% confidence interval, CI: 1.99–10.97); lack of use of antenatal steroids (OR: 9.57; 95% CI: 2.97–30.81); lack of nursing personnel (OR: 2.67; 95% CI: 1.34–5.33); fetal distress not detected antepartum when the fetus is monitored (OR: 2.92; 95% CI: 1.47–5.8) and poor progress in labour with incorrect interpretation of the partogram (OR: 2.77; 95% CI: 1.43–5.34).
Lessons learnt Quality-of-care audits were not shown to improve perinatal mortality in this study.

Source: *Bull World Health Organ 2015;93:424-428 Allanson et al.*

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

World Health Organization



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 dead important: for all antepartum, intrapartum and early neonatal deaths (during the first 7 days of the 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

World Health Organization

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

World Health Organization

	ANTENATAL DEATH	ICD-10 codes
A1	Congenital malformations, deformations and chromosomal abnormalities	Q00-Q99
A2	Infection	P35, P37, P39
A3	Antepartum hypoxia	P20
A4	Other specified antepartum disorder (Including codes specific to the antenatal period from haemorrhagic and haematological disorders of fetus and newborn)	P50, P52, P55, P56, P60, P61, P70, P75, P77, P83, P96.4
A5	Disorders related to fetal growth	P05, P08
A6	Antepartum death of unspecified cause	P95

ICD-PM group - Intrapartum deaths

World Health Organization

	INTRAPARTUM DEATH	ICD-10 codes
I1	Congenital malformations, deformations and chromosomal abnormalities	Q00-Q99
I2	Birth trauma	P10-P15
I3	Acute intrapartum event	P20
I4	Infection	P35, P37, P39, A50
I5	Other specified intrapartum disorder (Including codes specific to the intrapartum period from haemorrhagic and haematological disorders of fetus and newborn)	P50, P52, P55, P56, P60, P61, P70, P96
I6	Disorders related to length of gestation and fetal growth	P05, P07 P08
I7	Intrapartum death of unspecified cause	P95

ICD-PM groups - Neonatal deaths

World Health Organization

	NEONATAL DEATH	ICD-10 codes
N1	Congenital malformations, deformations and chromosomal abnormalities	Q00-Q99
N2	Disorders related to fetal growth	P05, P08
N3	Birth trauma	P10-P15
N4	Complications of intrapartum events	P20, P21,
N5	Convulsions and disorders of cerebral status	P90, P91
N6	Infection	P35-P39
N7	Respiratory and cardiovascular disorders	P22-P29
N8	Other neonatal conditions (Including codes specific to the neonatal period from haemorrhagic and haematological disorders of fetus and newborn, transitory endocrine and metabolic disorders specific to fetus and newborn, digestive system disorders of fetus and newborn, conditions involving the integument and temperature regulation of fetus and newborn, other disorders originating in the perinatal period)	P50-P61, P70-P78, P80-P83, P92-P94
N9	Low birth weight and prematurity	P07
N10	Miscellaneous	P96.4*
N11	Neonatal death of unspecified cause	P96

ICD-PM groups - Maternal condition

World Health Organization

	MATERNAL CONDITION	ICD-10 codes
M1	Complications of placenta, cord and membranes	P02
M2	Maternal complications of pregnancy	P01
M3	Other complications of labour and delivery	P03
M4	Maternal medical and surgical conditions	P00
M5	No maternal condition identified	
M6	Other	

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

- http://www.who.int/reproductivehealth/publications/monitoring/icd-10-perinatal-deaths/en/

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

- http://www.who.int/maternal_child_adolescent/documents/stillbirth-neonatal-death-review/en/

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

World Health Organization

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-gGTI

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 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

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

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

http://onlinelibrary.wiley.com/doi/10.1111/1471-0528.14246/full

Thank you!

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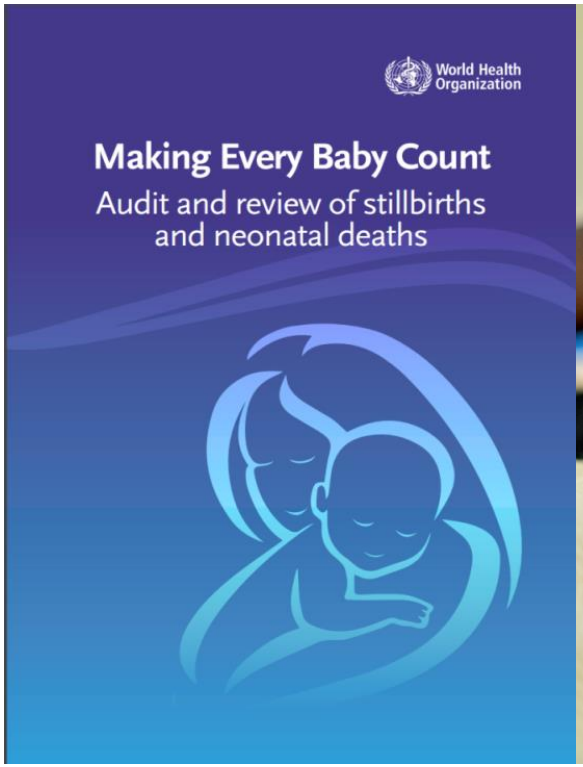
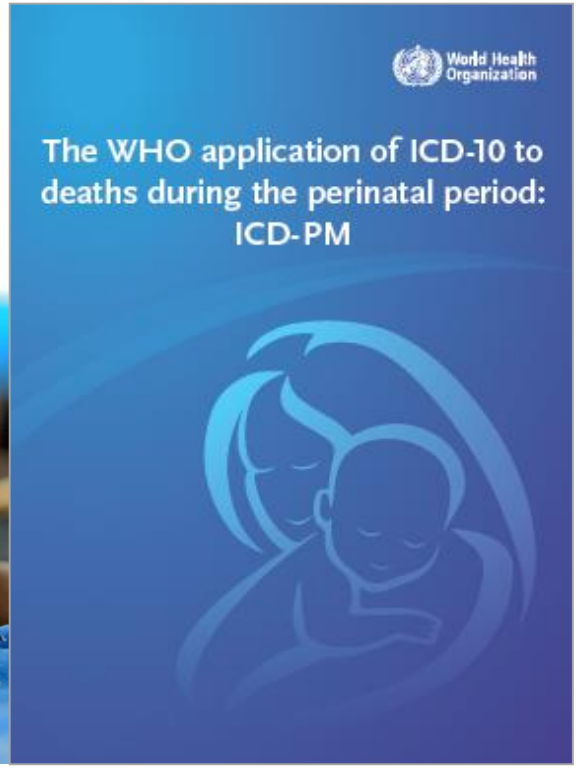




Group work - Instructions

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

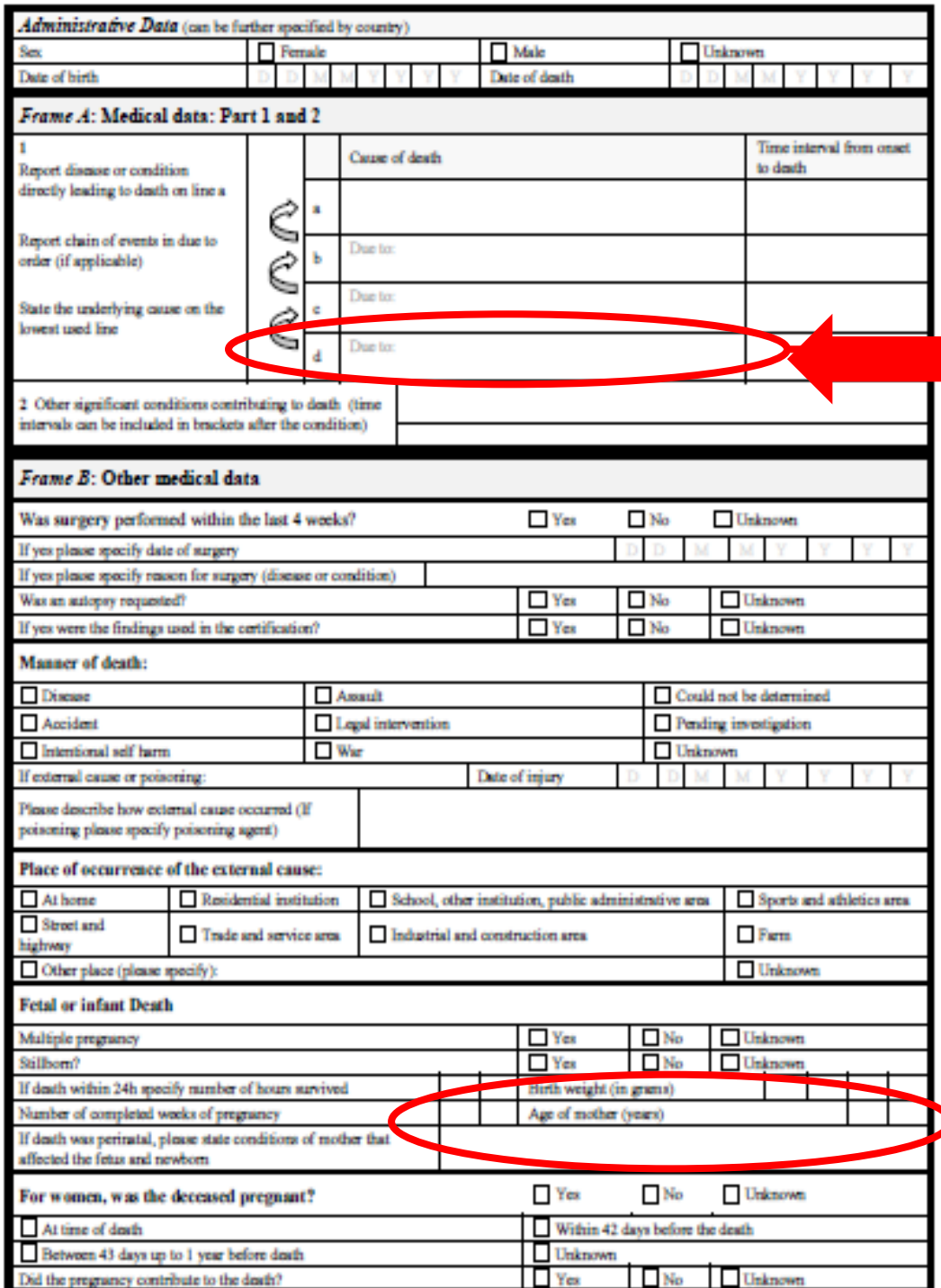
Causes of death	Clinical details	ICD-10 code
(a) Main disease or condition in fetus or infant	Meconium aspiration syndrome	P24.0
(b) Other diseases of conditions in fetus or infant	---	
(c) Main maternal disease or condition affecting fetus or infant	No maternal condition	
(d) Other maternal diseases or conditions affecting fetus or infant		

Final ICD-PM groups : N7; M5

Case 1

ICD-PM code N7;M5

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 (%)
Perinatal cause of death							
Antepartum death (A)							
A1: Congenital malformations, deformations and chromosomal abnormalities							
A2: Infection							
A3: Antepartum hypoxia							
A4: Other specified antepartum disorder							
A5: Disorders related to fetal growth							
A6: Fetal death of unspecified cause							
Total (%)							
Intrapartum death (I)							
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							
Total (%)							
Neonatal death (N)							
N1: Congenital malformations, deformations and chromosomal abnormalities							
N2: Disorders related to fetal 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							
Total (%)							



Administrative Data (can be further specified by country)

Sex	☐ Female	☐ Male	☐ Unknown
Date of birth	D D M M Y Y Y Y	Date of death	D D M M Y Y Y Y

***Frame A*: Medical data: Part 1 and 2**

		Cause of death	Time interval from onset to death
1 Report disease or condition directly leading to death on line a	a		
Report chain of events in due to order (if applicable)	b	Due to:	
State the underlying cause on the lowest used line	c	Due to:	
	d	Due to:	

2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)

***Frame B*: Other medical data**

Was surgery performed within the last 4 weeks?	☐ Yes	☐ No	☐ Unknown
If yes please specify date of surgery	D D M M Y Y Y Y		
If yes please specify reason for surgery (disease or condition)			
Was an autopsy requested?	☐ Yes	☐ No	☐ Unknown
If yes were the findings used in the certification?	☐ Yes	☐ No	☐ Unknown

Manner of death:

☐ Disease	☐ Assault	☐ Could not be determined
☐ Accident	☐ Legal intervention	☐ Pending investigation
☐ Intentional self harm	☐ War	☐ Unknown
If external cause or poisoning:	Date of injury	D D M M Y Y Y Y
Please describe how external cause occurred (If poisoning please specify poisoning agent)		

Place of occurrence of the external cause:

☐ At home	☐ Residential institution	☐ School, other institution, public administrative area	☐ Sports and athletics area
☐ Street and highway	☐ Trade and service area	☐ Industrial and construction area	☐ Farm
☐ Other place (please specify):			☐ Unknown

Fetal or infant Death

Multiple pregnancy	☐ Yes	☐ No	☐ Unknown
Stillborn?	☐ Yes	☐ No	☐ Unknown
If death within 24h specify number of hours survived	Birth weight (in grams)		
Number of completed weeks of pregnancy	Age of mother (years)		
If death was perinatal, please state conditions of mother that affected the fetus and newborn			

For women, was the deceased pregnant?	☐ Yes	☐ No	☐ Unknown
☐ At time of death	☐ Within 42 days before the death		
☐ Between 43 days up to 1 year before death	☐ Unknown		
Did the pregnancy contribute to the death?	☐ Yes	☐ No	☐ Unknown

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Main disease or condition in the fetus or infant

WHO death certificate

Main disease or condition in the mother

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

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

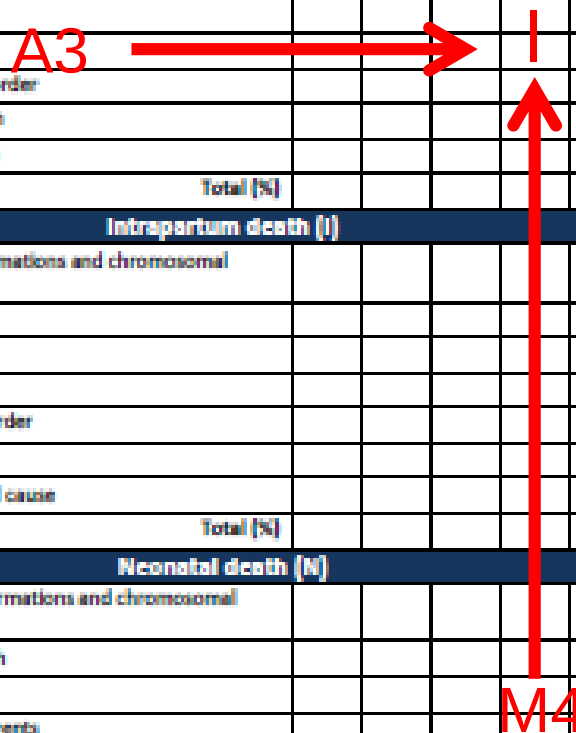
Final ICD-PM groups: A3; M4

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

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 (%)
Perinatal cause of death							
Antepartum death (A)							
A1: Congenital malformations, deformations and chromosomal abnormalities							
A2: Infection							
A3: Antepartum hypoxia							
A4: Other specified antepartum disorder							
A5: Disorders related to fetal growth							
A6: Fetal death of unspecified cause							
Total (%)							
Intrapartum death (I)							
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							
Total (%)							
Neonatal death (N)							
N1: Congenital malformations, deformations and chromosomal abnormalities							
N2: Disorders related to fetal 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							
Total (%)							



Case 3: Neonatal death

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

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

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.

Case 3

ICD-PM code N7;M3

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 (%)
Perinatal cause of death							
Antepartum death (A)							
A1: Congenital malformations, deformations and chromosomal abnormalities							
A2: Infection							
A3: Antepartum hypoxia							
A4: Other specified antepartum disorder							
A5: Disorders related to fetal growth							
A6: Fetal death of unspecified cause							
Total (%)							
Intrapartum death (I)							
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							
Total (%)							
Neonatal death (N)							
N1: Congenital malformations, deformations and chromosomal abnormalities							
N2: Disorders related to fetal 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							
Total (%)							