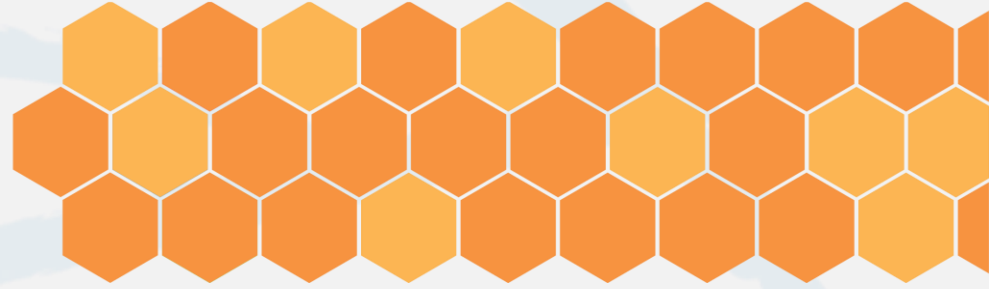# National capacity in CRVS
2nd workshop
Session 5
Cause of Death (CoD)

Workshop for national CRVS focal points

6-10 March 2017

Cause of death: WHO promotes…

- easy storage, retrieval and analysis of health information for **evidenced-based decision-making**;
- **sharing and comparing health information** between hospitals, regions, settings and countries; and
- data **comparisons in the same location** across different time periods.

Relevance of cause of death information

- Legal
  - To certify the occurrence of a death
  - To define the nature: natural causes or not
  - Civil Registration / vital statistics
  - Inheritance

- Statistical
  - Demographic aspects: sex, age, ethnic group, residence, socioeconomic data
  - Inform policies and the public

- Epidemiology / public health
  - Cause(s)
  - Data for specific groups: infant and maternal deaths

Structure of presentation

- Recommended procedure
- Organisational setup
- Assignment

Recommended procedure: Certification

- **Certification of death by medical doctor**, preferably one that has been treating the diseased.

- More important to have one that knows the medical history of the diseased, than one that sees the dead.

- In many countries it is mandatory for the certifier to see the corps (probably either to confirm that he or she is actually dead, or to eliminate external courses (like a road traffic accident or that someone is shot)

Attending doctor - ideally:

- Establish diagnosis
- Complete medical certificate of cause (International form – WHO)

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death		Approximate interval between onset and death
I Disease or condition directly leading to death*	(a)	....
	due to (or as a consequence of)	
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(b)	....
	due to (or as a consequence of)	
	(c)	....
	due to (or as a consequence of)	
	(d)	....
II Other significant conditions contributing to the death, but not related to the disease or condition causing it	....	....

*This does not mean the mode of dying, e.g. heart failure, respiratory failure.
It means the disease, injury, or complication that caused death.

Recommended procedure: Coding system

- **Use ICD -10**

- ICD-10 is internationally recognized, is maintained and has a lot of tools to support it.
- Disadvantage: Not available in all languages.

ICD-10

- International Classification of Diseases (ICD)
  - Volume 1 – Tabular List - *9700 terminal codes; 30000 terms*
  - Volume 2 – Instruction and guidelines manual
  - Volume 3 – Alphabetical index – *90K – 1.5 M terms, some user guidance*
- Originally used for classification of causes of death
- Now used for both mortality and morbidity
- Statistical classification
  - Groups similar diseases into categories
  - Uses an alphanumeric coding system

Classification hierarchy

- CHAPTER I
- Certain infectious and parasitic diseases (A00-B99)
- ***Intestinal infectious diseases (A00-A09)***
- **A00   Cholera**
- **A00.0   Cholera due to *Vibrio cholerae* 01, biovar   cholerae**
- Classical cholera
- **A00.1   Cholera due to *Vibrio cholerae* 01, biovar   eltor**
- Cholera eltor
- **A00.9   Cholera, unspecified**

The ICD-10 Short Mortality List (SMoL)

- 115 categories
- Focus on causes of death
- Fully compatible with ICD
- Expandable to full list of ICD later
- Simplified set of rules for underlying cause
- Death Certificate form in line with ICD-10 2016

Full ICD-10

- 9700 terminal codes
- Several pages of rules for selecting cause of death
- Standard death certificate
- Index some 400 K terms addressed
- Need own software
- IRIS

ICD SMoL

- 115 terminal codes
- 25 rules for selecting cause of death
- Near standard death certificate
- Some 6 k terms (or less)
- DHIS2 ready to collect and tabulate
- IRIS

Recommended procedure (?) Coding by certifier

- **Coding by certifier:** The doctor sees/knows the deceased, and it is easier to get supplementary information if it is necessary to do the coding.
- Disadvantage 1: Use of medical doctors time, time that may be better spent treating patients, saving lives.
- Disadvantage 2: Doctors does not fill in death certificates all that often and will be unfamiliar with causes of death that do not happened all that often. We will get an underestimation of rare causes.

Recommended procedure: Coding by central team

- **Coding by central team of coders:** Specialize to do the coding efficiently
- standardised coding, can use electronic tools (Iris)
- know rare causes better, saves medical doctors time

Coding *by e.g. Statistical Office*– ideally centralized
- Code causes of death (ICD code for each cause listed)
- Classify cause of death (select a single underlying cause of death for statistics according to ICD selection rules)
- Check validity, query

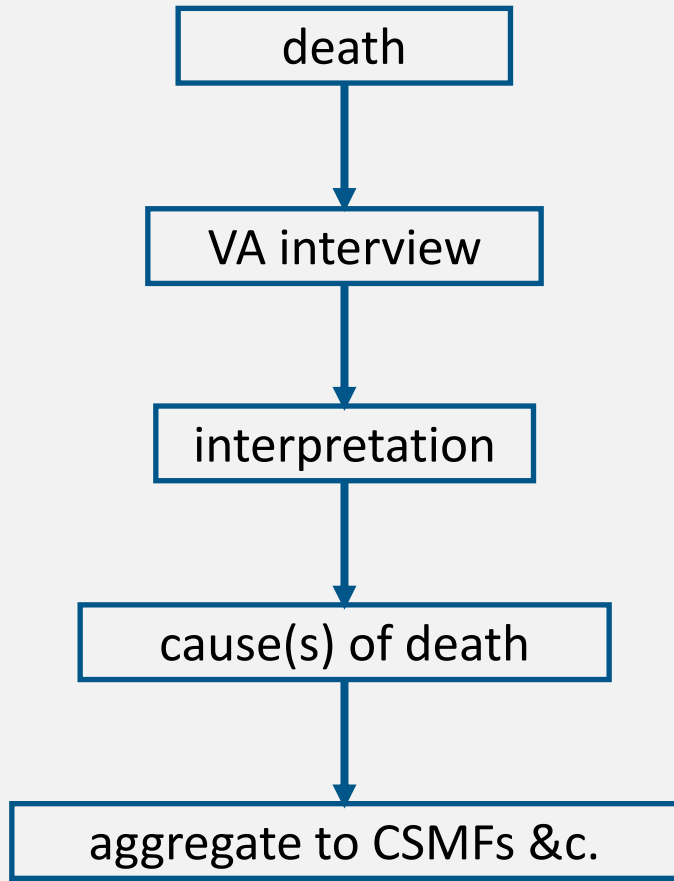# Recommended procedure when no doctor around

- **Verbal autopsy**
- Used when there is no medical doctor to certify the death.
- Is an interview with someone close to the deceased; Preferably someone who knew her, what she suffered from and how she died.
- Can be used as an electronic form, e.g. on phones or as a paper questionnaire.
- http://www.who.int/healthinfo/statistics/verbalauto psystandards/en/

Verbal autopsy

- Imperfect method,
  - necessary in populations where vital registrations with death certificates are not available.
- Long history
  - since 1930ies – maybe earlier since 1600
- Different Instruments - limited comparability
- International Standard
- 2004 VA review meeting: need international standard
- 2007 WHO and HMN standard VA tools
- 2012 WHO and partners simplified VA tool for routine use
- 2016 WHO and partners amendment of the simplified instrument: fully compatible to existing analytical software (SmartVA, InterVA, InSilicoVA)

Verbal Autopsy

```
┌──────────────────┐
│      death       │
└──────────────────┘
          │
          ▼
┌──────────────────┐
│   VA interview   │
└──────────────────┘
          │
          ▼
┌──────────────────┐
│  interpretation  │
└──────────────────┘
          │
          ▼
┌──────────────────┐
│ cause(s) of death│
└──────────────────┘
          │
          ▼
┌──────────────────────────┐
│  aggregate to CSMFs &c.  │
└──────────────────────────┘
```

- Notification that there was a death
- Ask close relative or friends (questionnaire)
- Assess cause of death based on report of Interview
  - 2 physicians
  - Software
    - Fast
    - Cheap
    - Internally consistent
    - Does not need physician time
    - Can be processed on hand-held devices
- WHO standards,
  - 2012/2014, for routine use – internationally agreed, evidence based reviews
  - 2007 for research

Sections of the WHO 2014 Verbal Autopsy Questionnaire

1. **Personal information**
    1. Age, sex
    2. Date and place of death, place of residence, marital status, parents, education, economic activity
2. **Information on the respondent**
3. **Cause of death related indicators**
    1. Medical history
    2. General signs and symptoms
    3. Signs and symptoms associated with pregnancy
    4. Neonatal and child history, signs and symptoms
    5. History of injuries and accidents
    6. Risk factors
    7. Health service utilization
4. **Background and context**
5. **Optional open narrative text field**
6. Death certification and health record

Sample paper form

SECTION5. GENERAL SIGNS AND SYMPTOMS ASSOCIATED WITH FINAL ILLNESS			
3B100	Did (s)he have a fever?	YES ☐ NO ☐ DK ☐ Ref. ☐	➡ 3B130 ➡ 3B130 ➡ 3B130
3B110	How many days did the fever last?	DAYS ☐☐	
3B115	How severe was the fever?	Mild ☐ Moderate ☐ Severe ☐	
3B120	Did (s)he have night sweats?	YES ☐ NO ☐ DK ☐ Ref. ☐	
3B130	Did (s)he have a cough?	YES ☐ NO ☐ DK ☐ Ref. ☐	 ➡ 3B180 ➡ 3B180 ➡ 3B180
3B140	For how many days did (s)he have a cough?	DAYS ☐☐	
3B150	Was the cough productive, with sputum?	YES ☐ NO ☐ DK ☐ Ref. ☐	

Sample electronic form

General signs and symptoms associated with final illness

Did (s)he have a fever? *

- ◉ Yes
- ○ No
- ○ DK
- ○ Ref

How many days did the fever last? *

Less than 1 day= "0". Use 1 week = 7 days to determine the number of weeks

Categories VA – matching ICD

VAs-01.01	Sepsis	A41	A40-A41
VAs-01.02	Acute respiratory infection, including pneumonia	J22/J18	J00-J22
VAs-01.03	HIV/AIDS related death	B24	B20-B24
VAs-01.04	Diarrheal diseases	A09	A00-A09
VAs-01.05	Malaria	B54	B50-B54
VAs-01.06	Measles	B05	B05

Organisational setup
Coordination at high level

To ensure that you can allocate time and money to the work.

- Ministry of health
- Statistical office
- Ministry of interior affairs
- Ministry of justice

High level coordinating group

Interagency technical group

Workflow - dataflow

Need to be part of the design from the begin

A. Reporting

B. Data collection

C. Coding

D. Feedback - Quality assurance

E. Report statistics on causes of death

- Local – subnational – national
- International

Communication and training

They all need to know and understand use and implications.

- Political
- Senior management
- Data personnel
- Physicians
- Coders

Regulatory and legal base

Ensure that there is continuity and responsibility, and resources can be mobilized.

- Reporting
- Coding
- Data access

Resources

Have the means to carry out the different steps.

- Form
- Hardware
- Coding tools
- Staff
- **Budget**

Planning

- Project description with
    - Clear tasks,
    - Specified roles
    - Timelines set
    - Feedback loops
    - Indicators for monitoring

Project group

- 9 months assessment + planning
- Operational plan for
  - Roll out
  - Running the system
- Pilot - national centre of excellence?
- Adjust operational plan
- Apply plan
- Review outcomes and adjust

Start simple

- Hospitals – urban – link existing other mechanisms (e.g. violent death reporting system)
- Expand stepwise
  - Budget
  - Plan
- No interference
  - Competing for human resources
  - Competing for attention
  - Competing for ownership of data

Assignment:

If you collect CoD data:

Describe the process today

Identify challenges

Suggest how the model can be improved

If you do not collect CoD data:

Suggest a collection process

	Occurrence of death	Certifying	Coding	Making VS
Deceased				
Family of the deceased				
Medical doctor				
Other health personnel				
Police				
Other official				
Ministry of Justice				
Ministry of Health				
Civil Registration authority				
National Statistics Office				
…				

	Occurrence of death	Certifying	Coding	Making VS
Deceased	Die			
Family of the deceased		Contribute to VA		
Medical doctor		Certify hospital deaths	Code deaths in hospitals	
Other health personnel				
Police		Fill in death form		
Other official				
Ministry of Justice				
Ministry of Health			Coding by a central team of coders	
Civil Registration authority				
National Statistics Office				Analyse data and disseminate statistics

	Occurrence of death	Certifying	Coding	Making VS
Deceased	Die			
Medical doctor		Certifies all deaths		
Norwegian Institute of Public Health			Codes all deaths using Iris	Analyse data and disseminate statistics
Coroner/ Pathologist		If suspicious/ unnatural		