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“Over 100 countries, representing more than two-thirds of the world’s population, do not have systems for civil registration and vital statistics that produce reliable data on causes of death. Without these data, countries and their development partners are working in the dark, throwing money into a black hole.”

Dr Margaret Chan, WHO Director-General at the Measurement and Accountability for Results in Health Summit, Washington, DC, USA 9 June 2015. https://www.who.int/dg/speeches/2015/health-measurement-summit/en/
Global demand for cause-of-death information
SDG-related cause-of-death targets & indicators

3.1 Reduce maternal mortality
3.2 Reduce under 5 and neonatal mortality
3.3 End epidemics of AIDS, TB, Malaria and NTDs
3.4 Reduce premature mortality from NCDs
3.6 Reduce deaths due to road traffic accidents
3.9 Reduce deaths from hazardous chemicals, pollution, etc.
8.8 Safe working environments
11.5 Reduce deaths from disasters
16.1 Reduce deaths from violence and homicides
To know why people die we need information on:

- Number of deaths
- By age
- By sex
- By date of death
- By place of death
- By manner of death (circumstances that result in death):
  - natural (disease);
  - unnatural (accident, homicide, suicide);
  - undetermined.
- By medical cause of death
  - Medical certification of cause of death by a physician
  - Medico-legal enquiry
  - Verbal autopsy for health outside health facilities
Sources of cause-of-death information

- Physician completes **medical certificate of cause of death (MCCD)** according to international standards.
- Pathologist (specialized medical doctor) performs a **clinical autopsy** (if cause cannot be determined through MCCD alone).
- Coroner requests **forensic autopsy** as part of a medico-legal enquiry (mainly for unnatural deaths).
- **Verbal autopsy** performed when death occurs outside of a health facility and without the attention of a medical practitioner. This is the only method for ascertaining cause of death when medical expertise is not available.
What is Verbal Autopsy (VA)?

- A non clinical method of gathering information about symptoms and circumstances of a death to determine cause.
- Consists of conversations or interviews with persons familiar with the deceased to elicit description of events, signs and symptoms prior to death.
- Structured interviews are analysed by health professionals (physician certified VA) or, increasingly, using automated algorithms to assign probable cause(s) of death.
Impetus for development of verbal autopsy

- A majority of the 60 million annual global deaths take place outside of a health facility and without the attention of a medical practitioner.
  - Bangladesh: ≈900,000 deaths annually; 15% in health facilities; 85% outside health facility without the attention of a medical practitioner who can complete the MCCD.
  - Until 2018, the WHO MCCD was not used in Bangladesh hospitals
  - There was no reliable cause of death information for the country

- VA can generate information on causes of deaths for non-facility deaths and enable government stakeholders and scientists analyse disease patterns and direct public health policy decisions.
Verbal autopsy is a well-tested technique

- 1989: VA workshop at Johns Hopkins School of Public Health.
- VA in health and demographic surveillance sites (HDSS) and sample “registration” systems (SRS, India, Indonesia*).
- 2005: WHO technical consultation to address complex VA landscape (multiple questionnaires, cause-of-death lists).
- 2007: WHO VA standards: questionnaires for neonates, 4 weeks to 14 years and 15 years and above.
- 2016: Harmonization of instruments: SMARTVA, WHO 2016; VA cause-of-death list consistent with ICD;
- Automated diagnostic algorithms to assign cause of death
- Routine VA implementation in the context of CRVS

* These systems should be called “sample enumeration systems” as the deaths identified are not registered in the civil registration system.
What verbal autopsy is ....

• A way of determining causes of death for deaths outside health facilities and without the attention of a medical practitioner.

• A method for ascertaining a statistically probable COD at the individual level.

• A means of generating plausible, population-level data on cause of death distributions (cause-specific mortality fractions) that can be assigned into broad ICD codes.

• A stimulus for improving the identification, notification and civil registration of community deaths.

What verbal autopsy isn’t

• Designed to generate a COD that is legally equivalent to medical certification of cause of death at the individual level.

• A replacement for medical certification of cause of death by a physician. VA-assigned cause is not included in the individual death certificate.

• Able to generate the detailed COD categories contained in the ICD-10.

• Intended to be administered to all deaths outside of a health facility. Instead, VA can be performed on a nationally representative sample of deaths, e.g. all deaths in a selected administrative area.
Integrating VA and CRVS systems: core principles

- All deaths are registered in the CRVS system with information on age and sex, and date and location.
- All deaths in health facilities are registered and have cause of death assigned through medical certification of cause of death (MCCD).
- A representative sample of deaths taking place outside of a health facility and without the attention of a medical practitioner have underlying cause of death determined through verbal autopsy in line with international standards.
- Dependent on collaboration between health and CRVS.
Integrating VA into CRVS

- CHW records death particulars during routine monthly household visit
- Supervisor checks details, removes duplicates

- Details of the deaths (date, location, age, sex) notified to the civil registrar.
- CHW makes appointment for follow up visit to family

- Civil registrar registers fact of death with age and sex

- CHW conducts verbal autopsy interview using tablet

- CHW uploads completed VA interview to central server for analysis using automated algorithms to determine probable cause of death

- Statistics on mortality by age, sex and cause shared with MoH and NSO
- Information on individual cause of death not shared with CHW, family or CRO.
Deaths registered and registration completeness in Kaliganj, Bangladesh, 2016

By end 2018, health assistants had conducted 7837 verbal autopsies: 7424 adults, 239 children and 174 neonates.
VA in context

Deaths registered by age & sex but no usable cause of death

All deaths registered by age and sex. Data on deaths by age and sex can be used for assessing patterns of all-cause mortality

Information from medical certificate of cause of death useable for legal purposes and public health policy but not nationally representative

Information on deaths by age and sex and cause-specific mortality fractions useable for public health policy and planning
Information on deaths by age and sex but no usable cause of death can be used for assessing emerging patterns of all-cause mortality.

Information from medical certificate of cause of death useable for legal purposes and public health policy but not nationally representative.

Information on deaths by age and sex and cause-specific morality fractions useable for public health policy and planning.
Deaths registered by age & sex but no usable cause of death

Deaths in health facilities with MCCD cause of death

Non facility deaths registered with cause determined using VA

Information on deaths by age and sex can be used for assessing emerging patterns of all-cause mortality

Information from medical certificate of cause of death useable for legal purposes and public health policy but not nationally representative

Information on deaths by age, sex and cause-specific morality fractions useable for public health policy and planning are generated from a nationally representative sample of registered deaths.
VA implementation guidance & tools

Integrating community-based verbal autopsy into civil registration and vital statistics (CRVS): system-level considerations

https://crvsgateway.info/file/9773/2594
CRVS Regional Action Framework

Target 3E

- By 2024, at least ... per cent of deaths taking place outside of a health facility and without the attention of a medical practitioner have their underlying cause of death code determined through verbal autopsy in line with international standards.

- Targets of 50% or 80% of community deaths with VA proposed prior to country experience of the implementation of VA in CRVS systems.
“Rather than aiming for 100 per cent, the ideal target for this indicator should be high enough to ensure that verbal autopsies are conducted on a sample of a sufficient size to be representative of deaths that occur in the absence of a medical practitioner.

AGREE

Countries with poor coverage of death registration could combine VA with sample vital registration (registration of vital events for a nationally representative sample) to produce vital statistics on the major causes of death.”

FURTHER CLARIFICATION

Aim should be universal death registration, MCCD for all deaths in the presence of medical care, and VA for a nationally representative sample of deaths.
VA integrated into the RAF

[RAF target 1.D]
- Universal registration of deaths

[RAF target 3D]
- MCCD for all hospital deaths

[RAF target 3E]
- By 2024, the national CRVS strategy includes the introduction of VA on a nationally representative sample of deaths taking place outside of a health facility and without the attention of a medical practitioner.
Strategies for achieving target 3E

- Community-based workers identify all deaths taking place outside of a health facility and without the attention of a medical practitioner and notify them to CRO for registration.

- Countries introduce VA on a nationally representative sample of deaths taking place without the attention of a medical practitioner.

- VA cause of death distributions are analyzed alongside data on causes of death from medical certification of deaths occurring in health facilities to produce a national overview of mortality and causes of death.
“Not every mystery involves a dead body, but every dead
body is a mystery. ..... Death is an assassin with infinite
aliases, and the question of what kills us is tremendously
complex. We ask it with clinical curiosity and keen it in
private grief; we pose it rhetorically and inquire specifically;
we address it to everyone from physicians to philosophers to
priests.

Why do we die?”

Source: Final Forms: What
Death Certificates Can Tell Us,
and What They Can’t. Kathryn
Schulz. Dept. of Public Health,
The New Yorker, April 7, 2014.
Thank you.
Using registered deaths by age and sex to track AIDS-related mortality

Female deaths 1997 - 2008, South Africa

ARVs introduced in public sector 2003

Source: Stats South Africa

Age group

Number of deaths

Source: Stats South Africa