Causes of Death

Data analysis and Report writing workshop for Civil registration and vital statistics data.

Adapted from Pacific Community’s Data analysis and report writing Workshop for the North Pacific
WHO. Global estimates of disease
Top 10 causes of deaths in low-income countries in 2016

- Lower respiratory infections
- Diarrhoeal diseases
- Ischaemic heart disease
- HIV/AIDS
- Stroke
- Malaria
- Tuberculosis
- Preterm birth complications
- Birth asphyxia and birth trauma
- Road injury

Crude death rate (per 100,000 population)

Top 10 causes of deaths in high-income countries in 2016

- Ischaemic heart disease
- Stroke
- Alzheimer disease and other dementias
- Trachea, bronchus, lung cancers
- Chronic obstructive pulmonary disease
- Lower respiratory infections
- Colon and rectum cancers
- Diabetes mellitus
- Kidney diseases
- Breast cancer

Crude death rate (per 100 000 population)

Main causes of mortality in children under 5 worldwide

- Conditions arising during the perinatal period
  - Tetanus
  - Pertussis
  - HIV/AIDS
  - Injuries
  - Congenital anomalies

- Lower respiratory infections

- Diarrhoeal diseases

- Other conditions

- Malaria

- Measles
Why cause of death is important

- Need to be able to target interventions to prevent or reduce premature mortality
- Different causes of death predominate in different ages
# Uses of cause of death data

<table>
<thead>
<tr>
<th>Who Needs CoDD?</th>
<th>What Kinds of CoDD Are Needed?</th>
<th>Why Are These CoDD Needed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO and national/international bodies</td>
<td>Global and national cause-specific mortality estimates; ICD coding</td>
<td>Standardised, comparable estimates over time and place</td>
</tr>
<tr>
<td>Local public health managers</td>
<td>Top-ranking causes of death and public health priorities</td>
<td>Monitoring trends over time and evaluating public health interventions</td>
</tr>
<tr>
<td>Epidemiologists and health services researchers</td>
<td>Relating to specific populations and subgroups</td>
<td>Interpreting particular situations in terms of mortality patterns</td>
</tr>
<tr>
<td>Institutional managers and clinical auditors</td>
<td>Patterns of deaths within institutions and health care systems</td>
<td>Monitoring trends over time and within departments</td>
</tr>
<tr>
<td>Medical and legal practitioners</td>
<td>Individual causes for particular cases</td>
<td>Following up consequences of individual deaths</td>
</tr>
</tbody>
</table>

CoDD, cause-of-death data.

Uses of cause of death data

- To study and explain trends / differentials in overall mortality (plague)
- To guide priorities for resource allocation for intervention programs, biomedical and sociomedical research (smoking)
- To monitor public health programs (immunization), health risks, and health interventions
- To provide clues for epidemiological research
- MORTALITY STATISTICS MORE EASY TO ACQUIRE THAN MORBIDITY DATA, since death is a unique, clearly defined event
Cause of death data needs

- Need to be comparable
  - Over time
  - Between countries

- Should provide an overview of total mortality burden

- Should identify vulnerable populations

- Be disaggregated by age and sex

Measures used include

- Numbers (# deaths from specific cause i.e. traffic accidents)
- Rates (number of traffic accidents per 100,000 adults aged 15-24)
- Proportional mortality (% of deaths due to traffic accidents)
# Key measures of causes of death

<table>
<thead>
<tr>
<th>Measure</th>
<th>Definition</th>
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<tr>
<td>Proportional mortality by cause</td>
<td>The proportion of deaths (as a percent) attributed to a specific underlying CoD (as defined by the International Classification of Diseases version 10, ICDv10). Can be for all ages and sexes or within a specific age group by sex.</td>
</tr>
<tr>
<td>Cause-specific mortality rate</td>
<td>Number of deaths in a specific sex and age group for a defined period attributed to a specific underlying CoD (as defined by ICDv10) divided by the total (mid-period) population in that sex and age group. Usually reported per 100,000 population.</td>
</tr>
</tbody>
</table>
Sources for cause of death in registration data

- Medical certification in health facilities/at home/in absentia
- Coroner’s/police records
- Verbal autopsy
- Lay reporting
- No cause
Level of certainty of underlying cause of death by data source

Increasing certainty

- Autopsy
- Medical certification by qualified practitioner
- Hospital discharge data
- Verbal autopsy (survey or routine)
- Other health reporting (i.e. Community nursing reports)
- Lay reporting

Gold Standard for Cause of Death Statistics

1. Complete Registration of Births and Death
2. Each death has medically assigned “Underlying cause of death”
3. Deaths certified using the WHO standard Cause of Death Certificate
4. Cause of death is coded using ICD-10 classification
Civil registration and COD

In a perfect world all deaths:

1. are registered
2. include a medically certified cause of death assigned by a physician
3. using the WHO International standard death certificate, and are
4. coded using the ICD-10.

However, this is much more likely to be true for deaths that occurred in hospital and much less common for community deaths.
Why can’t we rely on hospital data alone?

- The population that dies in hospital is not representative of the broader community

- Injuries and infectious diseases more likely to be missed
  - Are there other causes of death that would be affected?
Integrating different sources of COD data

CRVS system