WHO Mortality Database

A unique historical collection of cause-of-death statistics

Presented by Doris Ma Fat
on behalf of the

Department of Health Statistics and Information Systems
World Health Organization, Geneva

at

United Nations Sub-regional workshop on applying Principles and Recommendations for a Vital Statistics System for implementing the Regional Action Framework for CRVS in Asia

15-18 September 2015, Istanbul, Turkey
Purpose of this presentation

• Provide an overview of the mortality data collection

• Show its relevance to other surveillance systems

• List its strength and limitations

• Identify the challenges
Objectives of collecting cause-of-death statistics

- WHO is constitutionally mandated to establish and maintain statistical services and to provide information in the field of health.

- For causes of death, WHO aims to provide comparable statistics on causes of death across countries for:
  - information
  - scientific research
  - advocacy of health policies
WHO Mortality Database is a good source of information to analyse the health of nations

- Data are reported on an annual basis by country, year, sex, age and cause of death from civil registries

- Causes of death are coded according to the International Statistical Classification of Diseases and Related Health Problems (ICD)

- Historical data since 1950 with data coded to ICD 6, 7, 8, 9 and 10th revision
Standards enhance the comparability of mortality data

- The International Statistical Classification of Causes of Death and Related Health Problems (ICD) - to code and compare causes

- The International Form of Medical Certification of Cause of Death - to record all the conditions relating to the death

- ICD rules - to select the underlying cause of death
ICD-10 chapters (include natural causes &
external causes of death)

<table>
<thead>
<tr>
<th>Chapter Blocks</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>A00-B99 Certain infectious and parasitic diseases</td>
</tr>
<tr>
<td>II</td>
<td>C00-D48 Neoplasms</td>
</tr>
<tr>
<td>III</td>
<td>D50-D89 Diseases of the blood and blood-forming organs and certain disorders involving endocrine, nutritional and metabolic diseases</td>
</tr>
<tr>
<td>IV</td>
<td>E00-E90 Mental and behavioural disorders</td>
</tr>
<tr>
<td>V</td>
<td>G00-G99 Diseases of the nervous system</td>
</tr>
<tr>
<td>VI</td>
<td>H00-H59 Diseases of the eye and adnexa</td>
</tr>
<tr>
<td>VII</td>
<td>H60-H95 Diseases of the ear and mastoid process</td>
</tr>
<tr>
<td>VIII</td>
<td>I00-I99 Diseases of the circulatory system</td>
</tr>
<tr>
<td>IX</td>
<td>J00-J99 Diseases of the respiratory system</td>
</tr>
<tr>
<td>X</td>
<td>K00-K93 Diseases of the digestive system</td>
</tr>
<tr>
<td>XI</td>
<td>L00-L99 Diseases of the skin and subcutaneous tissue</td>
</tr>
<tr>
<td>XII</td>
<td>M00-M99 Diseases of the musculoskeletal system and connective tissue</td>
</tr>
<tr>
<td>XIII</td>
<td>N00-N99 Diseases of the genitourinary system</td>
</tr>
<tr>
<td>XIV</td>
<td>O00-O99 Pregnancy, childbirth and the puerperium</td>
</tr>
<tr>
<td>XV</td>
<td>P00-P96 Certain conditions originating in the perinatal period</td>
</tr>
<tr>
<td>XVI</td>
<td>Q00-Q99 Congenital malformations, deformations and chromosomal abnormalities</td>
</tr>
<tr>
<td>XVII</td>
<td>R00-R99 Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified</td>
</tr>
<tr>
<td>XVIII</td>
<td>S00-T98 Injury, poisoning and certain other consequences of external causes</td>
</tr>
<tr>
<td>XX</td>
<td>V01-Y98 External causes of morbidity and morality</td>
</tr>
<tr>
<td>XXI</td>
<td>Z00-Z99 Factors influencing health status and contact with health services</td>
</tr>
<tr>
<td>XXI</td>
<td>U00-U99 Codes for special purposes</td>
</tr>
</tbody>
</table>
Definition of the underlying cause of death

"the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury"
Member States are contacted on an annual basis for submission of their most recent cause-of-death statistics

- by WHO Regional Offices
- by WHO Headquarters

Take advantage of the Regional Offices knowledge and closer contacts with the countries to obtain the necessary information in a timely manner.

Ensure that the same data sets are used within WHO Headquarters and the Regional Offices.

Streamline the administrative and database management tasks shared by WHO Headquarters and its Regional Offices.
The data sent to WHO are systematically verified for:

- Incorrect use of the ICD (3- or 4-character), including failure to apply the periodic updates
- Invalid ICD codes
- Age and sex specific errors
- Unusual weird patterns or trends in causes

Queries are sent to countries for clarification

<table>
<thead>
<tr>
<th>COUNTRY code</th>
<th>YEAR</th>
<th>FORMAT</th>
<th>FORMAT INFANT</th>
<th>CAUSE</th>
<th>SEX</th>
<th>ICD</th>
<th>BLANK</th>
<th>All ages</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5-9</th>
<th>10-14</th>
<th>15-19</th>
<th>20-24</th>
<th>25-29</th>
</tr>
</thead>
<tbody>
<tr>
<td>XX</td>
<td>97</td>
<td>0</td>
<td>1</td>
<td>A09</td>
<td>1</td>
<td>104</td>
<td></td>
<td>354</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>XX</td>
<td>97</td>
<td>0</td>
<td>1</td>
<td>A09</td>
<td>2</td>
<td>104</td>
<td></td>
<td>486</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Civil registration coverage of cause of death (%), 2005–2011

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization
© WHO 2013. All rights reserved.
Trends in cause-of-death data reporting, by country income group

As of Jan 2014

Because of the typically observed lag of 18–24 months before countries report finalized latest data, it should not be inferred from these charts that reporting for the most recent years has decreased.

The implementation year of the ICD revisions are indicated by the dashed lines.
Trends in cause-of-death data reporting by ICD revision

As of Jan 2014

Because of the typically observed lag of 18–24 months before countries report finalized latest data, it should not be inferred from these charts that reporting for the most recent years has decreased.
The implementation year of the ICD revisions are indicated by the dashed lines.
Timeliness of data: the facts are

• Countries on average report their annual cause-of-death statistics usually 18 - 24 months later.

• We are currently requesting countries to submit their 2013 or 2014 data

• It is very rare that countries report their annual cause-of-death statistics 6 months later
Several factors affecting timeliness of data

- Centralized or decentralized processing of data
- Computerization, electronic death certificates
- Death certificates not finalized - pending verdict from coroner or medico-legal authority

In practice some countries temporarily assign deaths to "event of undetermined intent" pending verdict
Some major problems in data reporting

- For some countries reporting is sporadic
- Non-standard layouts of data files
- Confidentiality of data
- Detailed ICD codes and condensed list
- Comparability of data
Some potential sources of biases

- Type of certifiers - authorised doctors/ any medically qualified practitioner/ nurses
- Certification problems
- Coding practices
- Social stigma or pressures
Our unit (Mortality and Burden of Disease) uses the reported mortality data for producing:

- Demographic estimates (e.g. life tables) on a regular basis

- Global Health Estimates - one of the outcomes are estimates of causes of death by country, year, sex and age.

For countries which do not have mortality data, a model is used to estimate broad categories of causes of death.
The trend data from 1950 onwards enable the analyses of changes in patterns of causes of death (epidemiological transition)

Mexico 1960, 1980 and 2000
Other users of cause-of-death data

- WHO programmes (e.g. TB, Maternal)

- Research groups (child mortality, smoking-lung cancer, suicide)

- International organizations (UN, World Bank, OECD, etc)

- Other researchers (e.g. IARC)
Some areas where mortality data have been used in addition to other surveillance/monitoring systems

- Cancers: cancer registries linked to cancer deaths certified in death certificates
- Maternal deaths: Confidential inquiry into maternal deaths
- Suicide/ homicide: police reports
WHO Mortality Database

- Country-years can be selected and viewed online
- Complete raw datasets for about 120 countries can be downloaded in CSV format (requires some programming skills for use)
Future/ Challenges

WHO level

• Obtain more data from low-income countries. Actually the reported data represent only 1/3 of all the deaths in the world.

• Provide simplified procedures to low-resourced settings for collecting cause-of-death information
  http://www.who.int/healthinfo/civil_registration/ICD_10_SMoL.pdf?ua=1

• Ensure WHO continues to lead this area in terms of data collection and warehouse
Future/ Challenges

Country level

• Help countries to improve the quality of the reported data (ICD training, etc...)

• Develop further simple tools for countries to analyse their data.
  http://www.who.int/healthinfo/civil_registration/en/
  (tools: ANACoD, CodEdit)

Users' level

• Foresee the future needs of users (more disaggregated data, multiple causes of death)
• Thank you for your attention