WHO Mortality Data base

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
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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

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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**

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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**

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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

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FORM D1

REPUBLIC OF KENYA

THE BIRTHS AND DEATHS REGISTRATION ACT

(Cap. 149)

PERMIT FOR BURIAL

Serial No. DA **099976**   IP Number ....

1. NAME OF DECEASED ....
   First Name   Middle Name   Father's or husband's name

2. IDENTIFICATION /PASSPORT NUMBER..................................

4. SEX: Male ☐ Female ☐ 5. AGE............. 6. DATE OF DEATH ....
                          Year s Month s Days   Day Month Year

9. USUAL RESIDENCE ....
                    Sub-location or estate and town   District

After making due inquiry as to cause of the death of the above named deceased person. I hereby authorize the interment of the body.

18. DATE:.................   19. REGISTRATION ASSISTANT FOR: 20. SIGNATURE
    Day   Month   Year

PERMIT ISSUED TO (NAME): .... ID No. .... SIGNATURE ....

- -

FORM D1

REGISTER OF DEATH

099976 ((for use in health institutions and by Medical Practitioners)

Serial No. DA   IP Number ....

1. NAME OF DECEASED ....
   First Name   Middle Name   Father's or husband's name

2. IDENTIFICATION /PASSPORT No................ 3. NATIONALITY.............

4. SEX: Male ☐ Female ☐ 5. AGE........... 6. DATE OF DEATH...........
                          Years months days   Day Month Year

7. MARITAL STATUS: (a) Married ☐ (b) Divorced ☐ (c)Single ☐ (d) Widowed ☐

8. PLACE OF DEATH:../...........
              Health Institution/Sub-location or estate and town.   District

9. USUAL RESIDENCE../...........
              Sub-location or estate and town   District

10. LEVEL OF EDUCATION ....11. OCCUPATION ....

12. CAUSE OF DEATH (PRINT IN BLOCK LETTERS, DO NOT ABBREVIATE) ....

IMMEDIATE CAUSE: disease or condition directly leading to death (a)...........
                                    Due to

ANTECEDENT CAUSES: Morbid conditions, if any, which gave rise to immediate cause (a)
                    (b)...........
                              Due to stating the underlying condition last
                    (c)...........

OTHER SIGNIFICANT CONDITIONS: Contributing to death but not related to (a) ....

13. CERTIFICATE: I certify that:
    (a) I attended the deceased before death or
    (b) I examined the body after death; or
Tick as (c) I conducted a post-mortem examination of the body, and that the above information is correct to
Appropriate   the best of my knowledge.

14. NAME...........................15. TITLE...........

16. DATE...........................17. SIGNATURE...........

18. DATE...................19. REGISTRATION ASSISTANT FOR: 20. SIGNATURE...........
    Day   Month   Year   (Name of health institution)

MEDICAL CERTIFICATION

REGISTRATION ASSISTANT

Health S

d Health nization

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**

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ICD-10 chapters (include natural causes & external causes of death)

Chapter	Blocks	Title
I	A00-B99	Certain infectious and parasitic diseases
II	C00-D48	Neoplasms
III	D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving
IV	E00-E90	Endocrine, nutritional and metabolic diseases
V	F00-F99	Mental and behavioural disorders
VI	G00-G99	Diseases of the nervous system
VII	H00-H59	Diseases of the eye and adnexa
VIII	H60-H95	Diseases of the ear and mastoid process
IX	I00-I99	Diseases of the circulatory system
X	J00-J99	Diseases of the respiratory system
XI	K00-K93	Diseases of the digestive system
XII	L00-L99	Diseases of the skin and subcutaneous tissue
XIII	M00-M99	Diseases of the musculoskeletal system and connective tissue
XIV	N00-N99	Diseases of the genitourinary system
XV	O00-O99	Pregnancy, childbirth and the puerperium
XVI	P00-P96	Certain conditions originating in the perinatal period
XVII	Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities
XVIII	R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere...
XIX	S00-T98	Injury, poisoning and certain other consequences of external causes
XX	V01-Y98	External causes of morbidity and mortality
XXI	Z00-Z99	Factors influencing health status and contact with health services
XXI	IU00-U99	Codes for special purposes

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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.

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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

COUNTRY code	YEAR	FORMAT	FORMAT INFANT	CAUSE	SEX	ICD	BLANK	All ages	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29
XX	97	0	1	A09	1	104		354	6	4	4	2	1	1	0	0	2	3
XX	97	0	1	A09	2	104		486	6	3	1	0	0	4	0	0	1	0

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Civil registration coverage of cause of death (%), 2005–2011
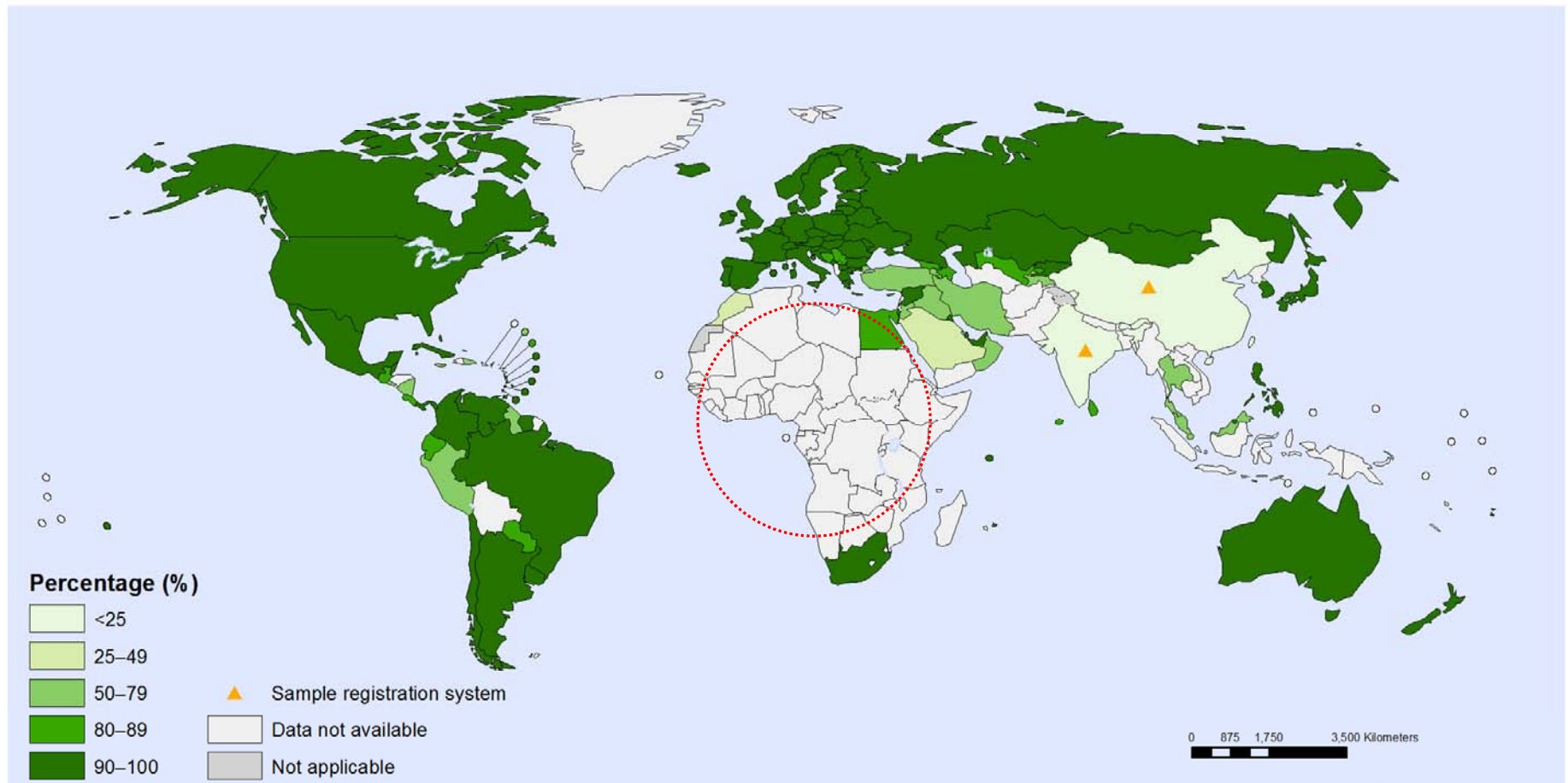
Percentage (%)
- <25
- 25–49
- 50–79
- 80–89
- 90–100

▲ Sample registration system

Data not available

Not applicable

0   875   1,750   3,500 Kilometers

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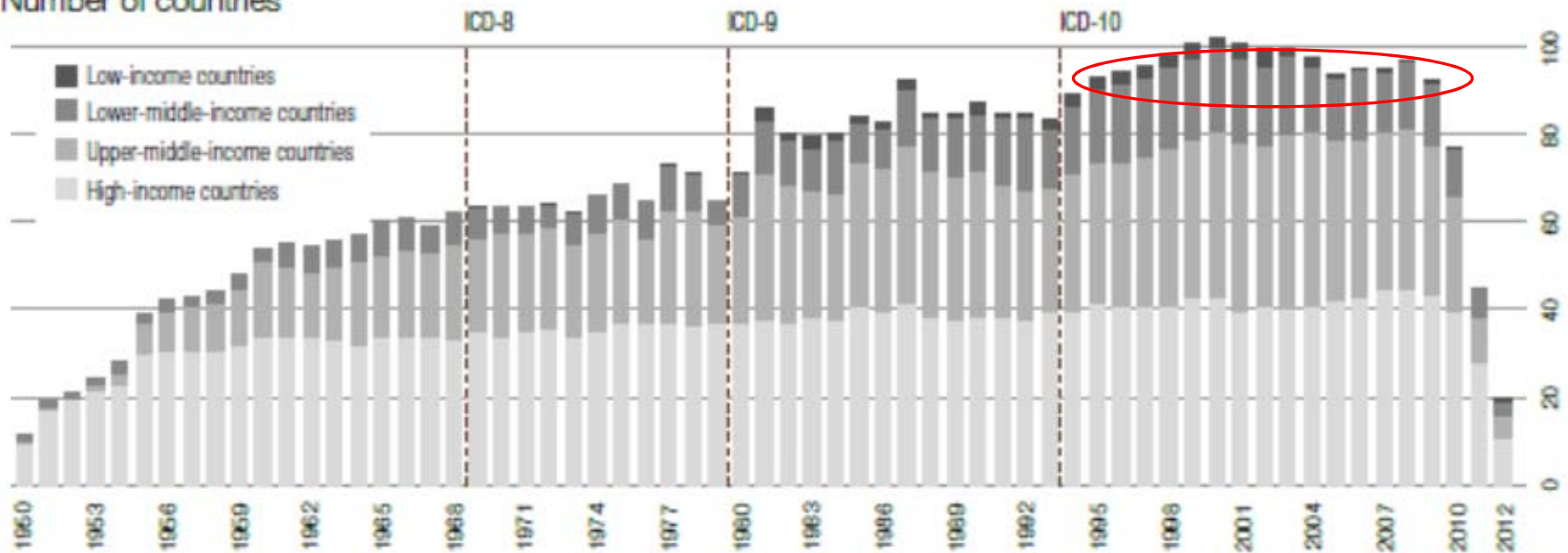and Geographic Information Systems (GIS)
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Trends in cause-of-death data reporting, by country income group

By income group
Number of countries

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.
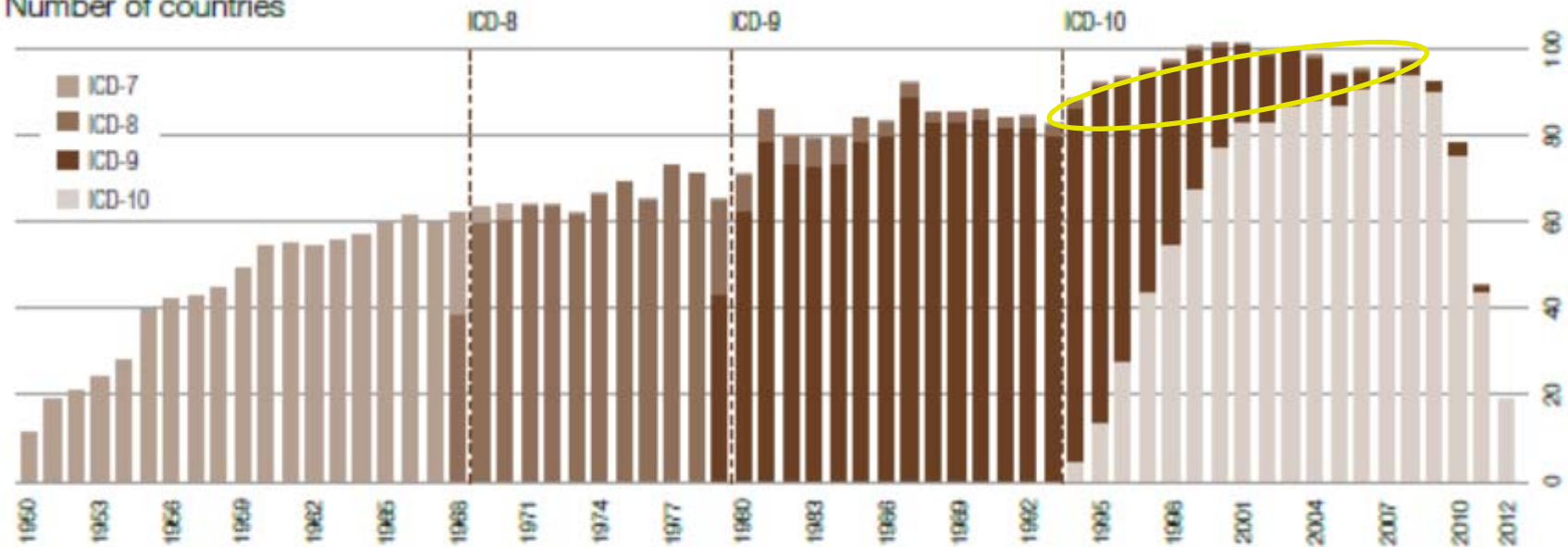
The implementation year of the ICD revisions are indicated by the dashed lines.

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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.

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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

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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

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Some potential sources of biases

- Type of certifiers – authorised doctors/any medically qualified practitioner/nurses

- Certification problems

- Coding practices

- Social stigma or pressures

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# Our unit (Mortality and Burden of Disease) uses the reported mortality data for producing:

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

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The trend data from 1950 onwards enable the analyses of changes in patterns of causes of death (epidemiological transition)

Mexico 1960, 1980 and 2000

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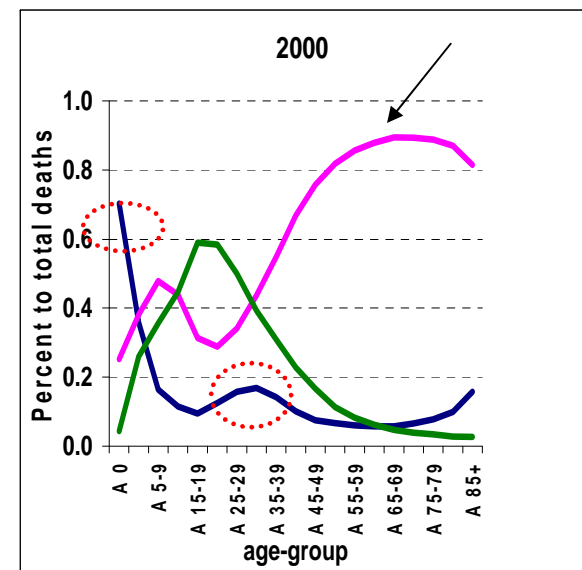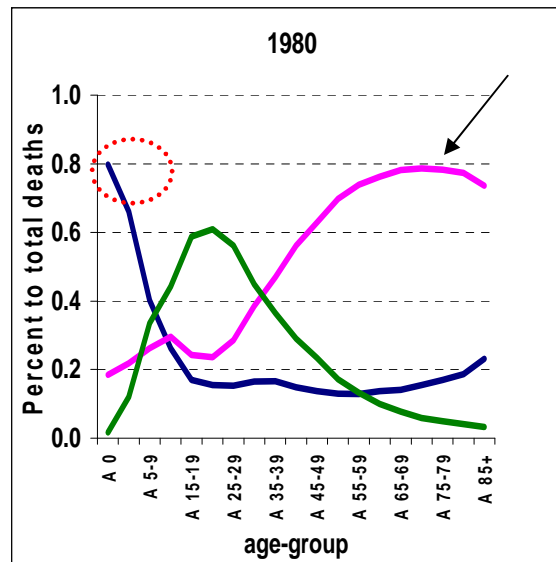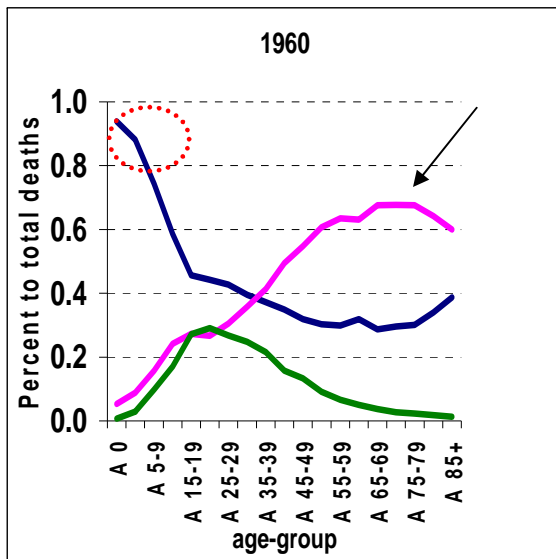
Other users of cause-of-death data

- **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)**

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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

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WHO Mortality Database

- **http://www.who.int/healthinfo/mortality_data/en/**

- **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)**

- **Analysis of quality of data in WHO Bulletin March 2005 (Mathers et al.), World Health Statistics 2012**

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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

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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 disagreggated data, multiple causes of death)

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- Thank you for your attention