

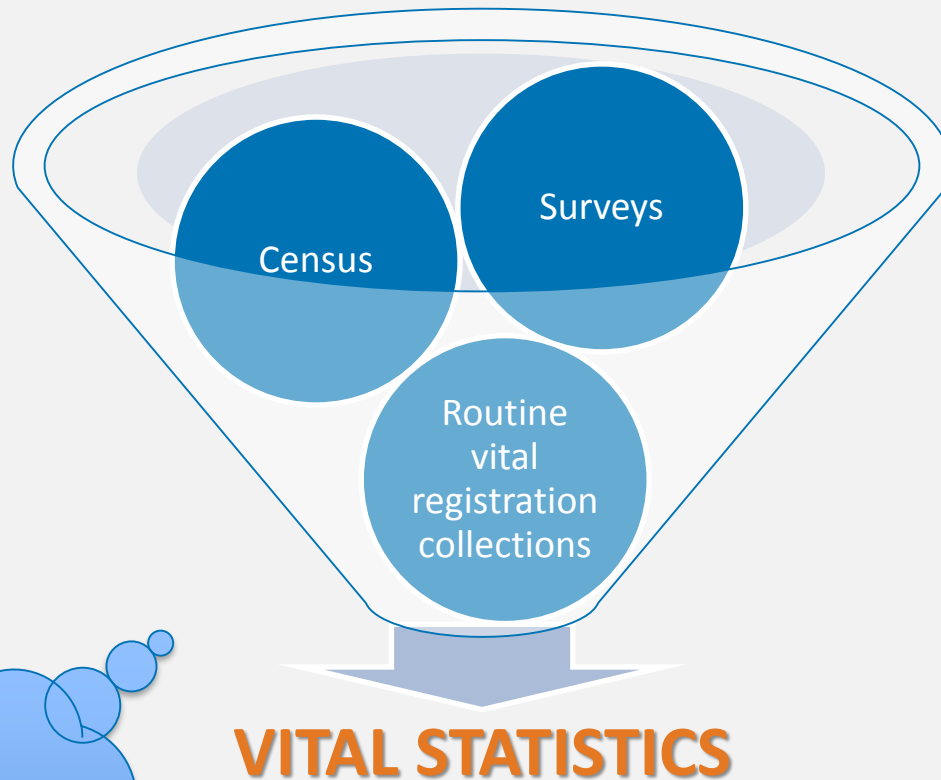


Get
every one
in the picture

Sources of Data

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

Sources of data



Should be seen as
complementary
rather than
alternative
options

Data sources can be classified as:

- ◆ **Population-based data sources**, which are those that are representative of the whole population.
 - ◆ population surveys
 - ◆ censuses
 - ◆ civil registration (when complete)
- ◆ **Institution-based data sources**, which are those collected routinely from administrative and operational activities.
 - ◆ Health Information Systems (HIS)
 - ◆ hospital discharge data
 - ◆ police records for attended deaths
 - ◆ health facility surveys, where data are collected in an institution

Periodic vs. Routine collections

◆ Periodic collection

- ◆ Censuses
- ◆ Surveys



◆ Routinely collected administrative data

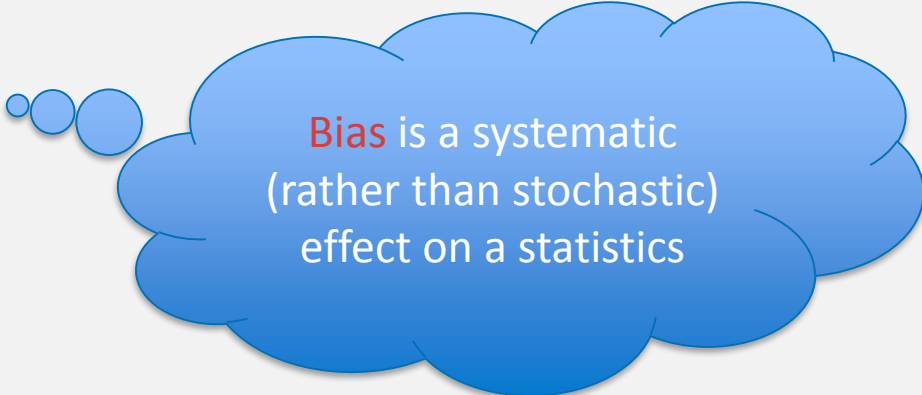
- ◆ CRVS
- ◆ HIS/ Hospital information
- ◆ Health facility data



Census

A **population census** is a compulsory, universal and simultaneous enumeration of the national population, conducted on a periodic basis.

- ◆ Censuses provide denominators (population) for computing fertility and mortality indicators
- ◆ Can also provide numerators (births and deaths), and data for indirect estimation of mortality through a question on retrospective events which can have
 - ◆ **recall bias**, and
 - ◆ **response bias**




Bias is a systematic (rather than stochastic) effect on a statistics

Census

A **population census** is a compulsory, universal and simultaneous enumeration of the national population, conducted on a periodic basis.

- ◆ Censuses provide denominators (population) for computing fertility and mortality indicators
- ◆ Can also provide numerators (births and deaths), and data for indirect estimation of mortality through a question on retrospective events which can have
 - ◆ **recall bias**, and
 - ◆ **response bias**

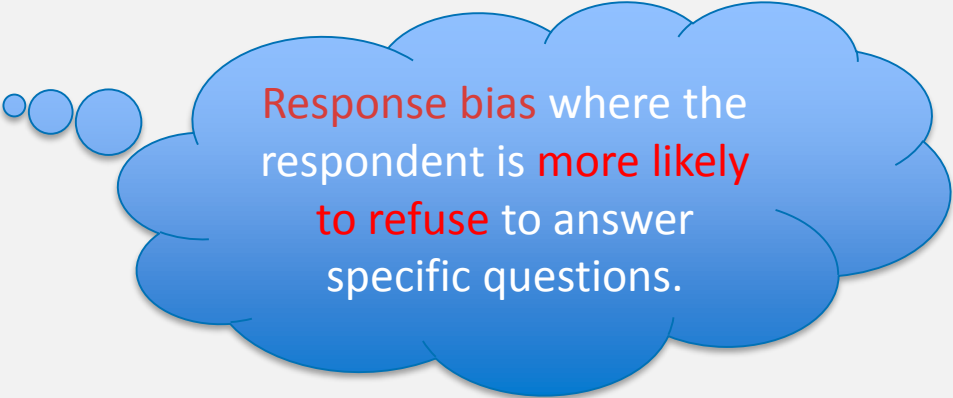


Recall bias where the respondent is **more likely to recall some** events than others.

Census

A **population census** is a compulsory, universal and simultaneous enumeration of the national population, conducted on a periodic basis.

- ◆ Censuses provide denominators (population) for computing fertility and mortality indicators
- ◆ Can also provide numerators (births and deaths), and data for indirect estimation of mortality through a question on retrospective events which can have
 - ◆ **recall bias**, and
 - ◆ **response bias**



Response bias where the respondent is **more likely to refuse** to answer specific questions.

Census

A **population census** is a compulsory, universal and simultaneous enumeration of the national population, conducted on a periodic basis.

- ◆ Censuses provide denominators (population) for computing fertility and mortality indicators
- ◆ Can also provide numerators (births and deaths), and data for indirect estimation of mortality through a question on retrospective events which can have
 - ◆ **recall bias**, and
 - ◆ **response bias**
- ◆ Big delay, happen every 5 or 10 years.

Periodic Surveys

- ◆ Household surveys such as Demographic and Health Surveys (**DHS**) and the UNICEF Multi-Indicator Cluster surveys (**MICS**).
- ◆ Not continuous data collections, but are collected in a **specific period** of time and re-occur ~every 5 years.
- ◆ Collect data for a **proportion** of the population considered to be representative of the broader population of interest.
- ◆ The reliability of estimates from survey data is driven by how well the **sample selection** reflects the broader population of interest
- ◆ May calculate direct estimation of mortality from reported deaths, or indirect estimation methods. But it should be considered that is often limited to specific age-groups & causes rather than all-ages all-causes mortality
- ◆ Before any analysis it should be checked whether there are enough observations.
- ◆ Surveys are also subject to
 - ◆ **recall bias**, and
 - ◆ **response bias**



REPRESENTATIVE

Civil Registration

- ◆ **Civil registration** provides a legal basis for the recording of vital events such as live births & deaths
- ◆ In most developed countries, it is a legal requirement that:
 - ◆ vital events, such as births and deaths, are registered
 - ◆ a medical practitioner completes a *death certificate* with a cause of death whenever anybody dies
- ◆ An efficient routine CRVS system, with medical certification of cause of death, provides continuous and relatively low cost data collection
 - ◆ upheld as the “**gold standard**” for birth and death data
- ◆ An effective vital registration system requires coordination across Ministries and government agencies.

Civil Registration

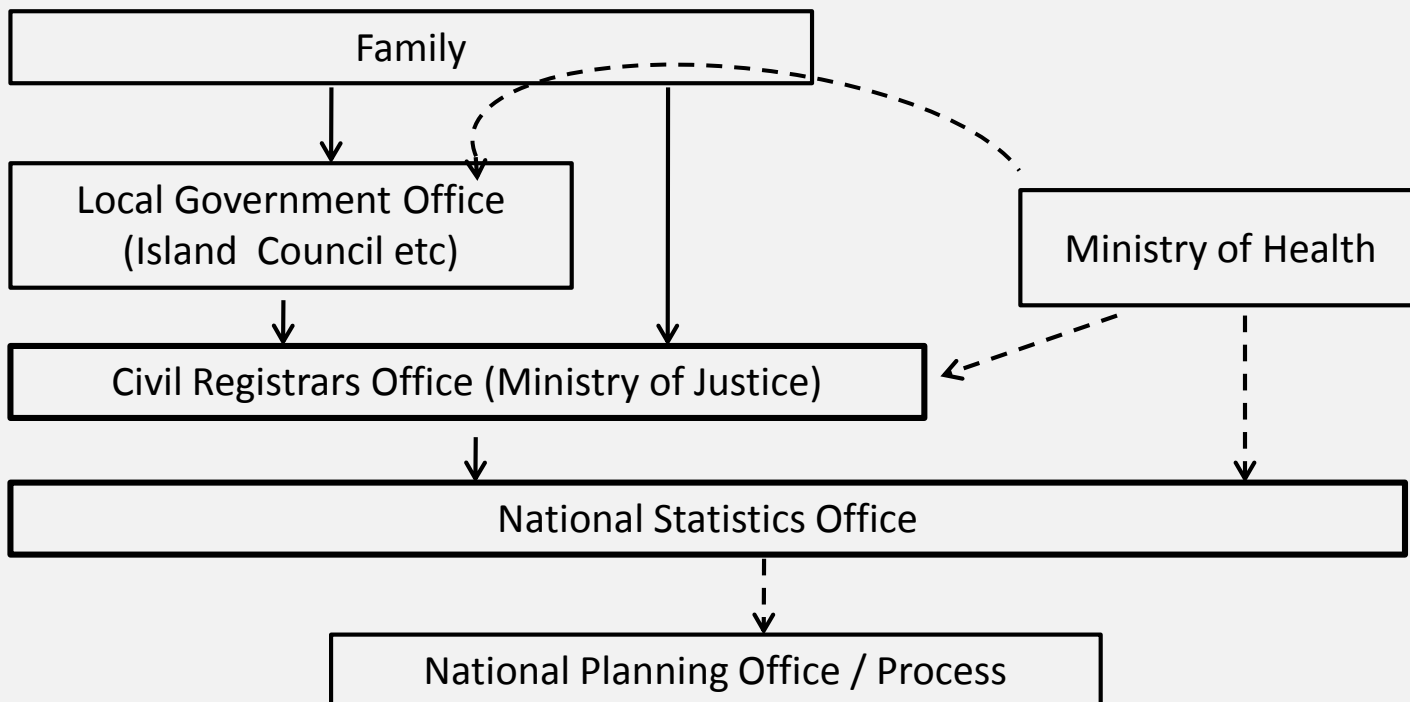
- ◆ However, because data is collected for administrative and legal purposes, data quality may not be as high as a census or survey who's primary function is to collect data
- ◆ Citizen/government responsibility (Platform, incentives)
- ◆ Passive system, as opposed to active enumeration from surveys or census
- ◆ Multiple government agencies responsible
 - ◆ Data transmission losses, need for inter-sectoral collaboration
- ◆ Difficulties in data quality, cause of death determination in some situations (report by family members, medical certificate)

Health registration of vital events



- ◆ Vital events such as births and deaths are also often recorded through routine data collections within the health system.
- ◆ Compared to civil registration system, health data collections are primarily to inform operational decisions, and CoD is central to this purpose.
- ◆ Health systems for reporting death may include a vital registration system (a record of all deaths both in the health facilities and the community) based on medical certificates or community nursing reports, or facility based data

Figure 5.1: Diagram of the reporting and registration processes for deaths



Demographic surveillance sites



- ◆ A demographic surveillance system (DSS) captures all vital events in a specified area.
- ◆ Often combined with disease detection (sentinel surveillance)
- ◆ Unlikely to be a suitable solution where small populations mean rates are often quite unstable and already need to be averaged over several years to be interpretable
- ◆ Focusing enumeration in specified areas over a number of years could result health interventions that makes the sites become less representative of the broader population over time.

Summary of Population based Data Collection Approaches for Mortality Data

Data Source		Periodicity	Sample frame	Period of interest	Data collection (mortality level data)	CoD Data Collected?
Census		Periodic – 5-10 years	Whole Population	Retrospective	Direct - (deaths in the household) Indirect – partial birth history (CEB/CS) & orphanhood data	No
Survey	DHS	Periodic – ~ 5 years	Selected sample – representative of whole population	Retrospective	Direct – complete birth history	No
	MICS	Periodic – ~ 5-10 years	2 stage clustered sample – representative of whole population	Retrospective	Indirect - partial birth history (CEB/CS)	No
	Other household based surveys	Usually once-off	Varies	Retrospective	Varies	Possible - using verbal autopsy
Routine vital registration	Civil Registration	Continuous	Whole population (depending on coverage)	Current	Direct reporting of event	Yes
	Health vital registration	Continuous	Whole population (depending on coverage)	Current	Direct reporting of event	Yes
	Hospital discharge records	Continuous	Hospital cases only	Current	Direct reporting of event	Yes
Other routine databases	Various	Continuous	Varies – usually targets sub-population of specific interest.	Current	Direct reporting of event	Usually limited
Demographic surveillance Sites		Continuous	Selected areas – usually not representative of whole population over time.	Current	Direct reporting of event	Yes

Institution-based data sources

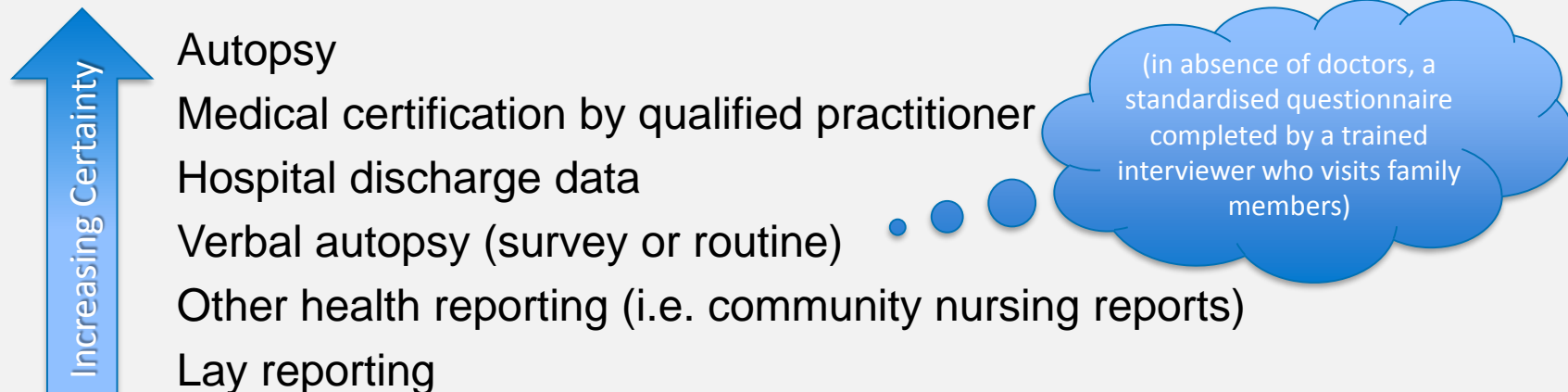
- ◆ Include those based at hospitals and health centres and cover:
 - ◆ Data available on preventive services, acute curative services, follow-up of chronic disease, inpatient care, laboratory or radiographic examinations, referrals, immunisations, etc.
 - ◆ Utilisation of case records and disease records
 - ◆ Delivery of services e.g. growth monitoring of children, antenatal care
 - ◆ Cancer registries, pregnancy registers

- ◆ Unit record data on deaths and CoD may be collected through:
 - ◆ hospital separation data (discharged home, transferred to other facility or died)
 - ◆ Primary or community health care nursing programs
 - ◆ Lay reporting by community leaders

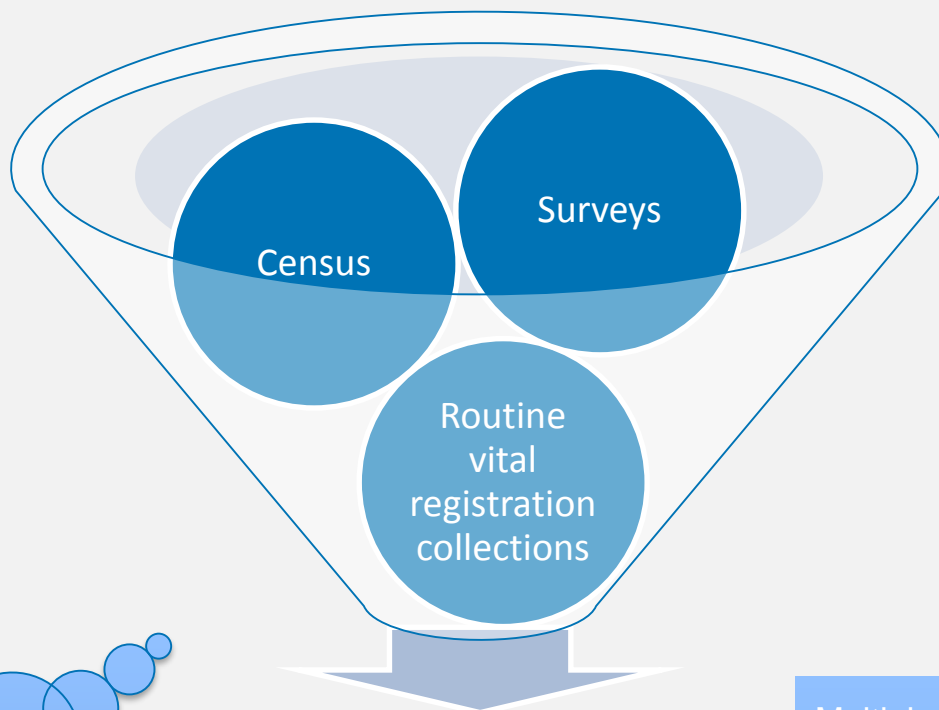
- ◆ Police data may include:
 - ◆ Information on road traffic accidents
 - ◆ Homicides
 - ◆ Unintentional injuries

Data sources to ascertain causes of death

- ◆ Cause of death data can be obtained through medical certification, hospital discharge records, verbal autopsy, nursing reports, or lay reports from family and other community representatives.
- ◆ Level of certainty of underlying cause of death by data source



Sources of data




VITAL STATISTICS

Should be seen as
complementary
rather than
alternative
options

Multiple data sources can be used to compute indicators

A common method is using population data from a census as denominator while another data source is used as numerator

Care must be taken ensuring areas of enumeration (e.g. region/province) are consistent



Complete, vital registration data in conjunction with routine medical certification of death, is considered the “gold standard” data source for vital statistics due to the relatively low cost of data collection, the ongoing nature of collection, and representativeness of the whole population.