Surveillance Systems & IS
Implementation Science in Health

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What is surveillance?

- Public health surveillance is the ongoing, systematic **collection, analysis, interpretation, and dissemination** of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health.
- Surveillance data can be used to:
  - Guide immediate public health action
  - Guide the planning, implementation, and evaluation of programs
  - Evaluate policy
  - Detect changes in health practices
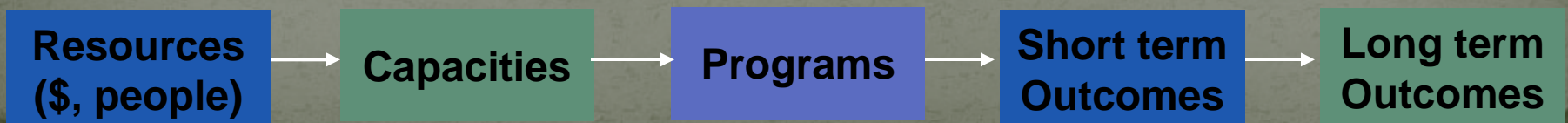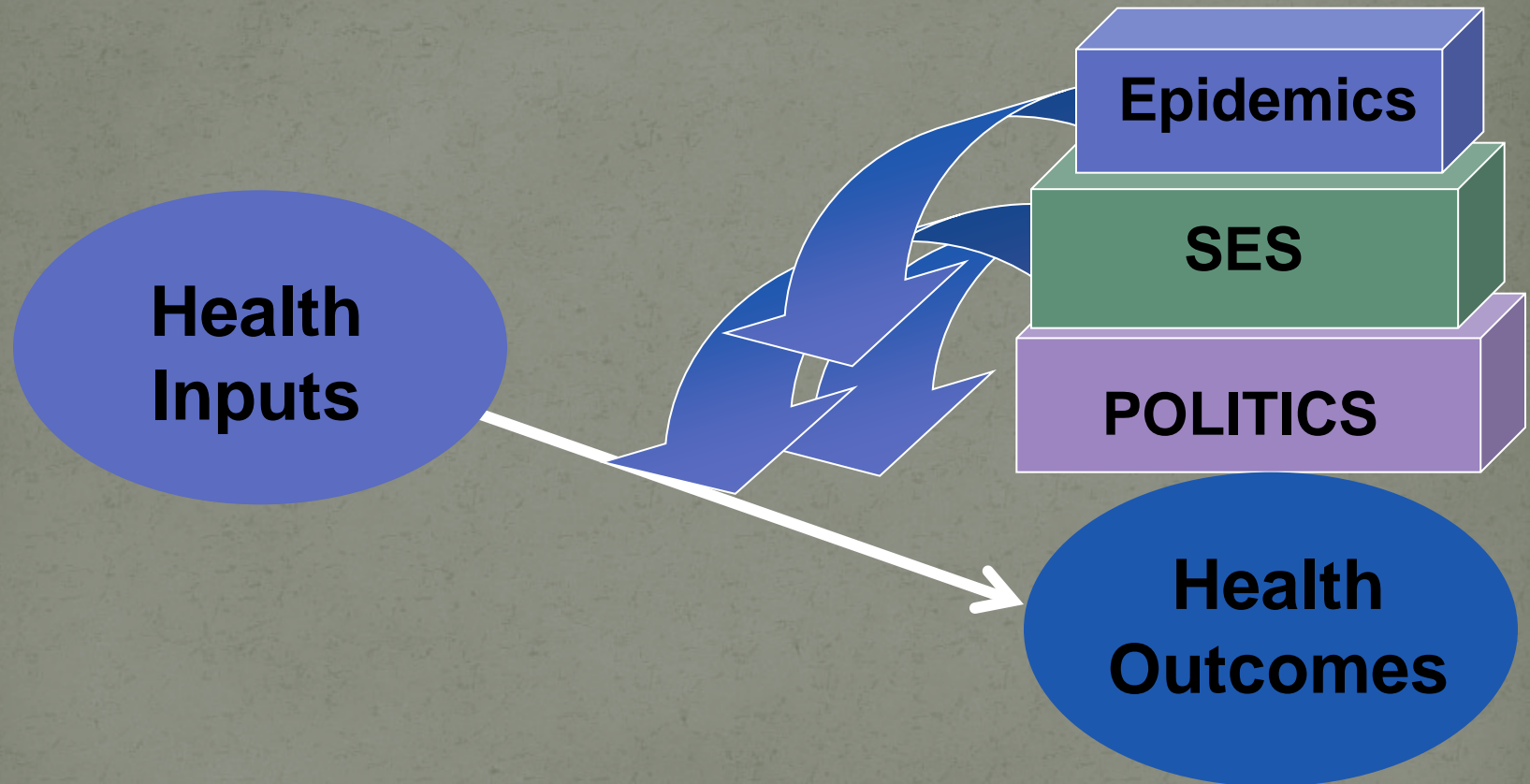 - Provide a basis for epidemiologic research
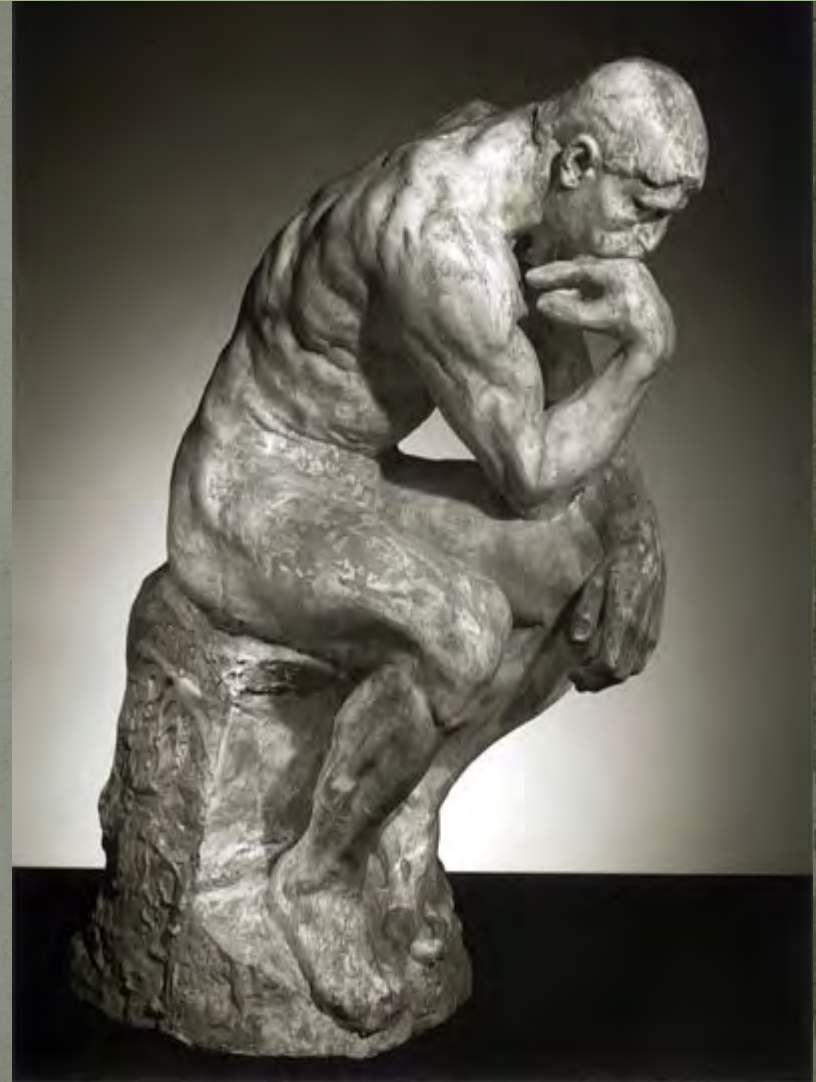
Program Interventions Logic Model

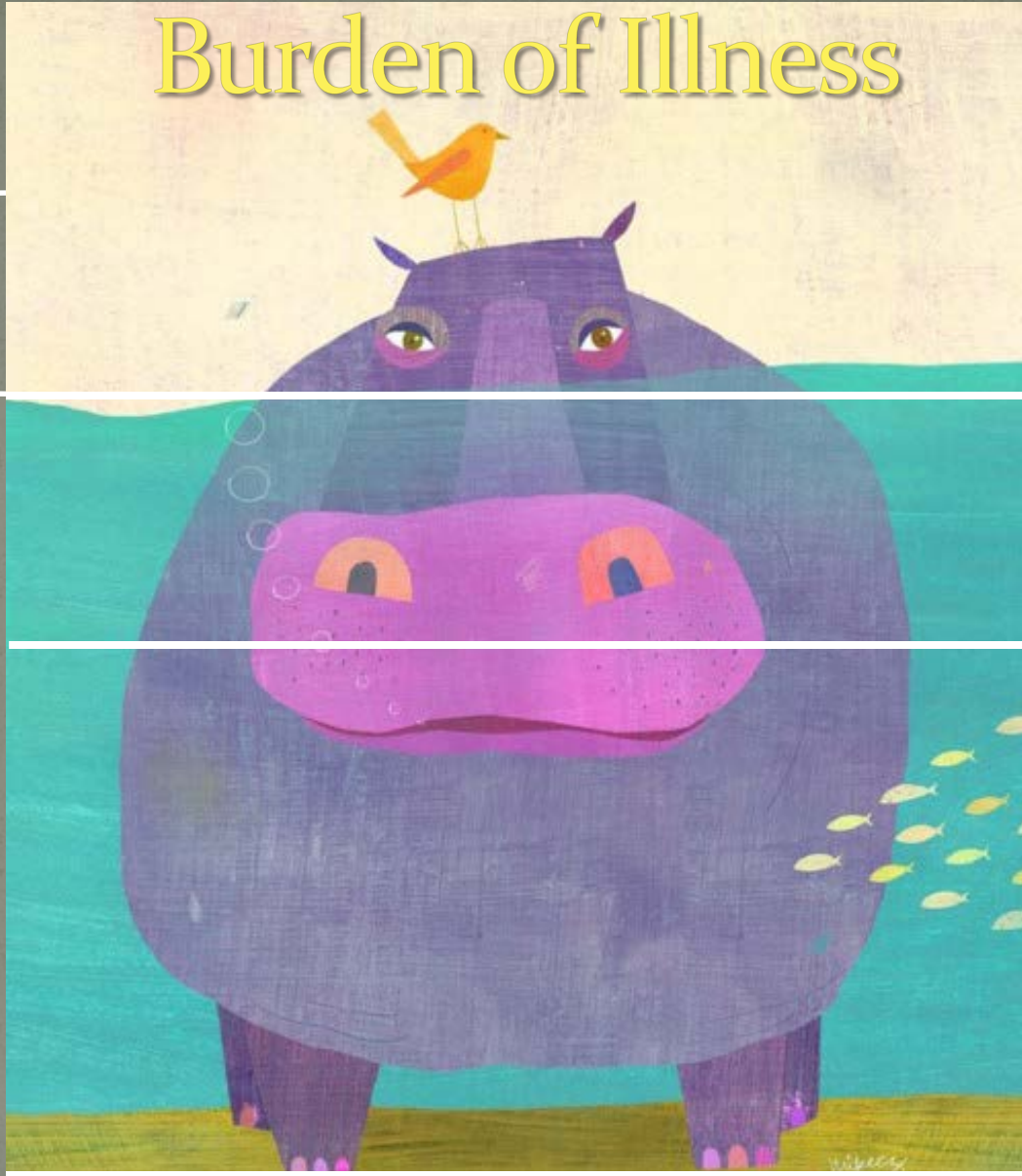# But, outside factors have a big influence on outcomes

- System design problems
  - Surveillance systems measure health outcomes, not program impact

- Data quality problems
  - Surveillance data suffer from quality problems

Burden of Illness

Active surveillance

Passive surveillance

Sick individuals who seek care

Sick individuals who do not seek care (at our clinic or elsewhere)

Mild or asymptomatic who do not seek care (at our clinic or elsewhere)

Surveillance Systems

Allow for monitoring and impact evaluation of current diseases and interventions , and new interventions and emerging threats

GHI targets

Infectious diseases

Interventions

Non-infect. diseases

MDGs

Surveillance Systems

Attributes of a good surveillance system

Simplicity

Flexibility

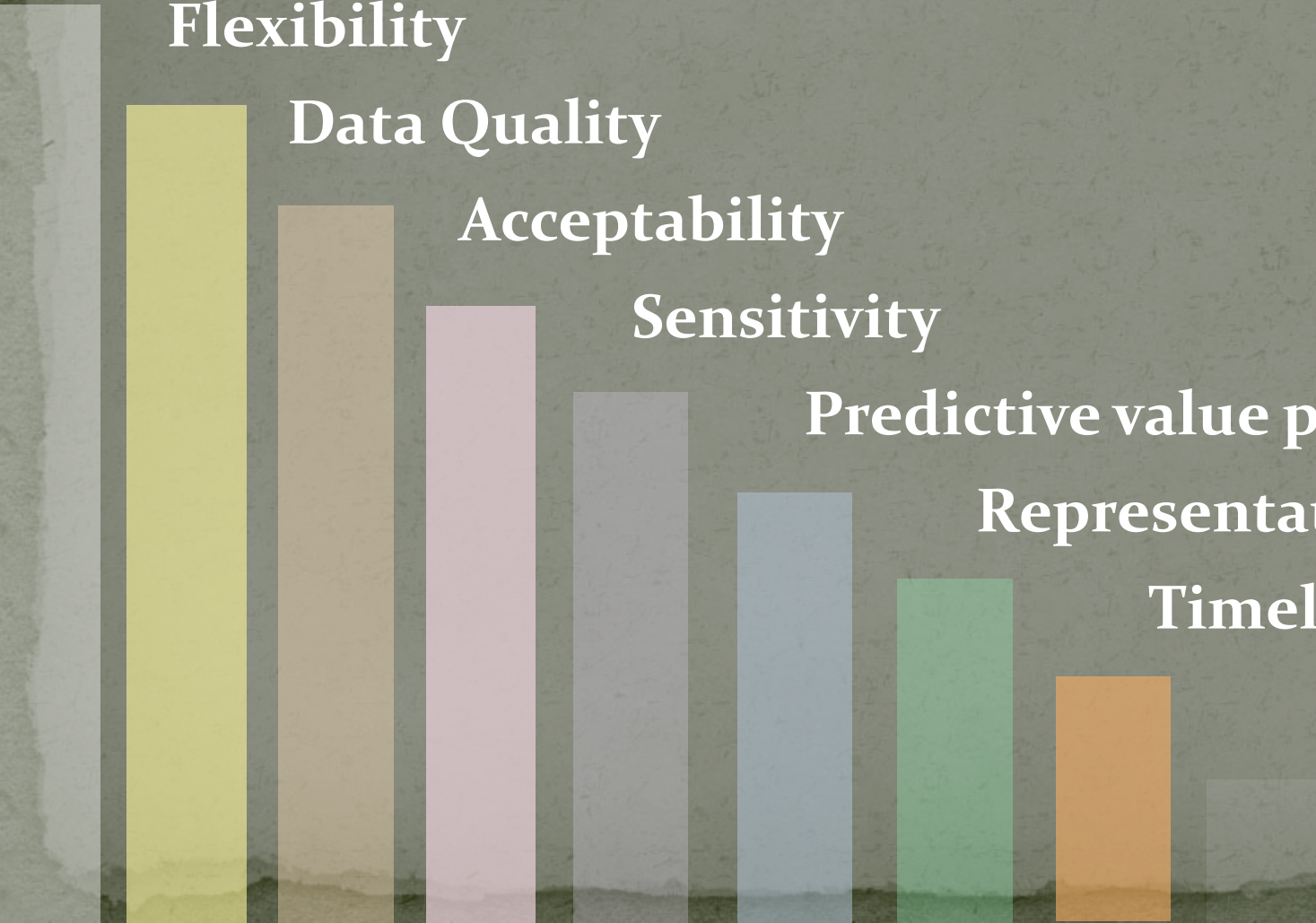**Data Quality**

Acceptability

Sensitivity

Predictive value positive

Representativeness

Timeliness

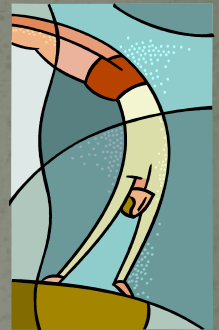**Stability**

Attributes of a good surveillance system

Simplicity

Is the system simple in structure and easy to operate?

Flexibility

Can the system adapt to changing information needs or operating conditions with little additional time, personnel or allocated funds?
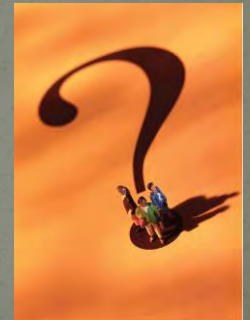

Data Quality

Is the information in the system complete and valid?

Acceptability

Are people and organizations willing to participate in the surveillance system?

Attributes of a good surveillance system

Sensitivity

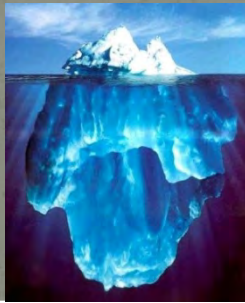What proportion of actual cases are detected by the surveillance system?

Predictive Value Positive

What proportion of cases actually have the disease under surveillance?
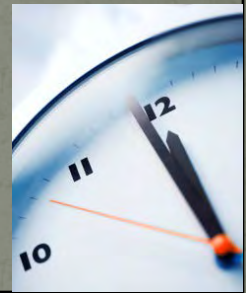
Representativeness

What proportion of actual cases are detected by the surveillance system?

Timeliness

How quickly does the system receive and process information?

Stability

How reliable is the system (reliability is the ability to collect, manage, and provide data properly without failure)?

Available surveillance systems

- Six basic surveillance systems are commonly available

- These systems can be more or less robust

- Depending on the program, you will need to rely on one or more systems
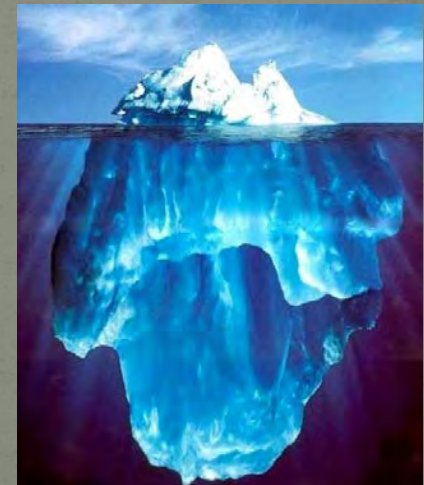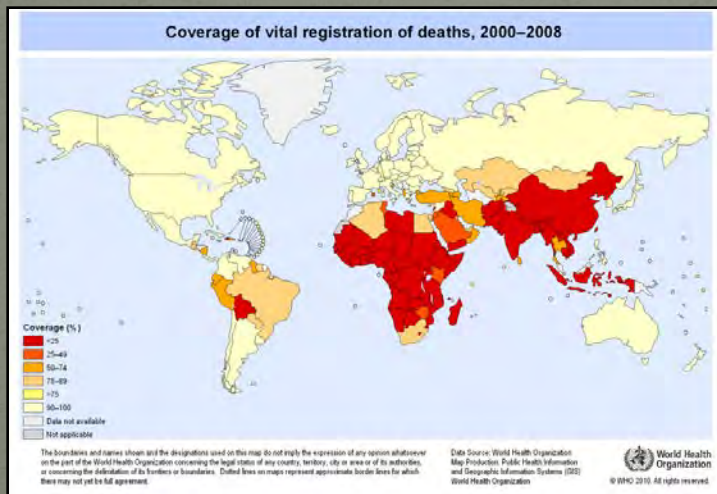
Surveillance system #1: Census

- A regularly occurring and official count of a particular population
- Censuses provide the denominator to calculate rates of disease
- By UN recommendation, censuses should occur every 10 years

Timeliness

Surveillance system #2: Vital events

- Also called "civil registration"
- Universal recording of occurrence and characteristics of vital events (live births, deaths, fetal deaths, marriages and divorces)

Coverage of vital registration of deaths, 2000–2008

Representativeness

Surveillance system #3: Registries

- Disease reporting, active or passive, used most often for infectious diseases
  - TB, HIV, cancer, etc.

Sensitivity

Surveillance system #4: Administrative data sets

- Service records from health care providers and other sectors
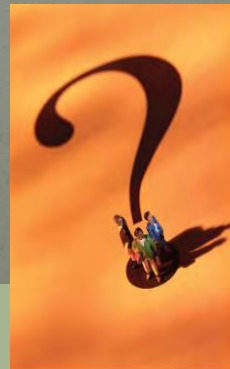
Stability   Data Quality

Surveillance system #5: Household surveys

- Household surveys on health measures, knowledge, beliefs, spending and inequities
- Can include biological and clinical data collection
- Probably the most valuable for information about program effectiveness

Flexibility

Acceptability

Surveillance system #6: National health accounts

- Resource records focus on the quality, availability and logistics of health service inputs.

- National Health Accounts (NHA) monitor trends in health spending for all sectors - public and private, and include activities, providers, diseases, population groups and regions
  - Sub accounts also carried out

Simplicity