Performance Measurement for Community Health Improvement

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Learning Objectives

- Understand the goals, objectives and principles of performance measurement in health
- Apply the principles of performance measurement for community health improvement
- Choose a set of valid and actionable community-based performance measures
- Analyze and critique community-based performance measures

Outline

- ***Community health assessment principles***
- Performance measurement
  - Principles
  - Healthcare examples
  - Application to population health
- Exercise
- Case study: Monitoring public health preparedness

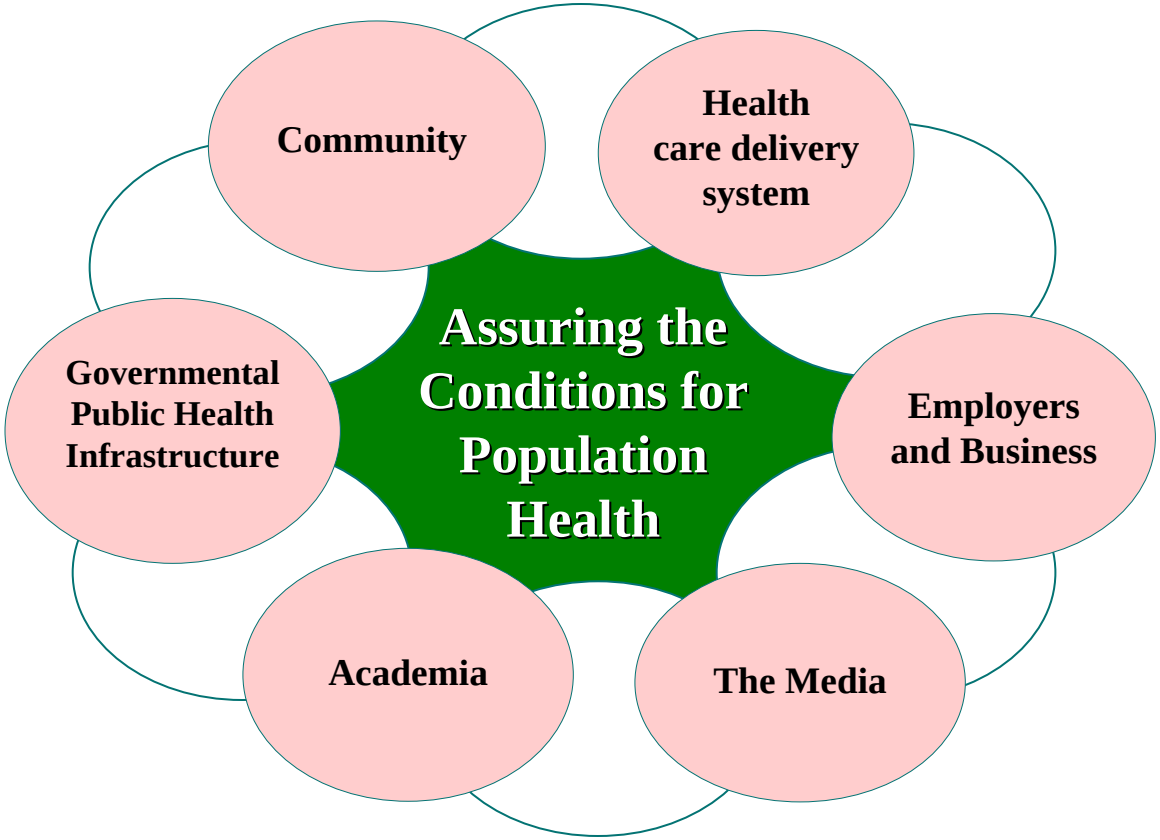
“Population Health”

- Kindig and Stoddart: The health outcomes of a group of individuals, including the distribution of such outcomes within the group
- Characteristics of the population health perspective
  - Broader array of the determinants of health than in traditional public health
  - Recognition that responsibility for health is diffuse
- Management of population health
  - Systems perspective, partnerships
  - Increasing amounts of public health activities are managed not within but between institutions

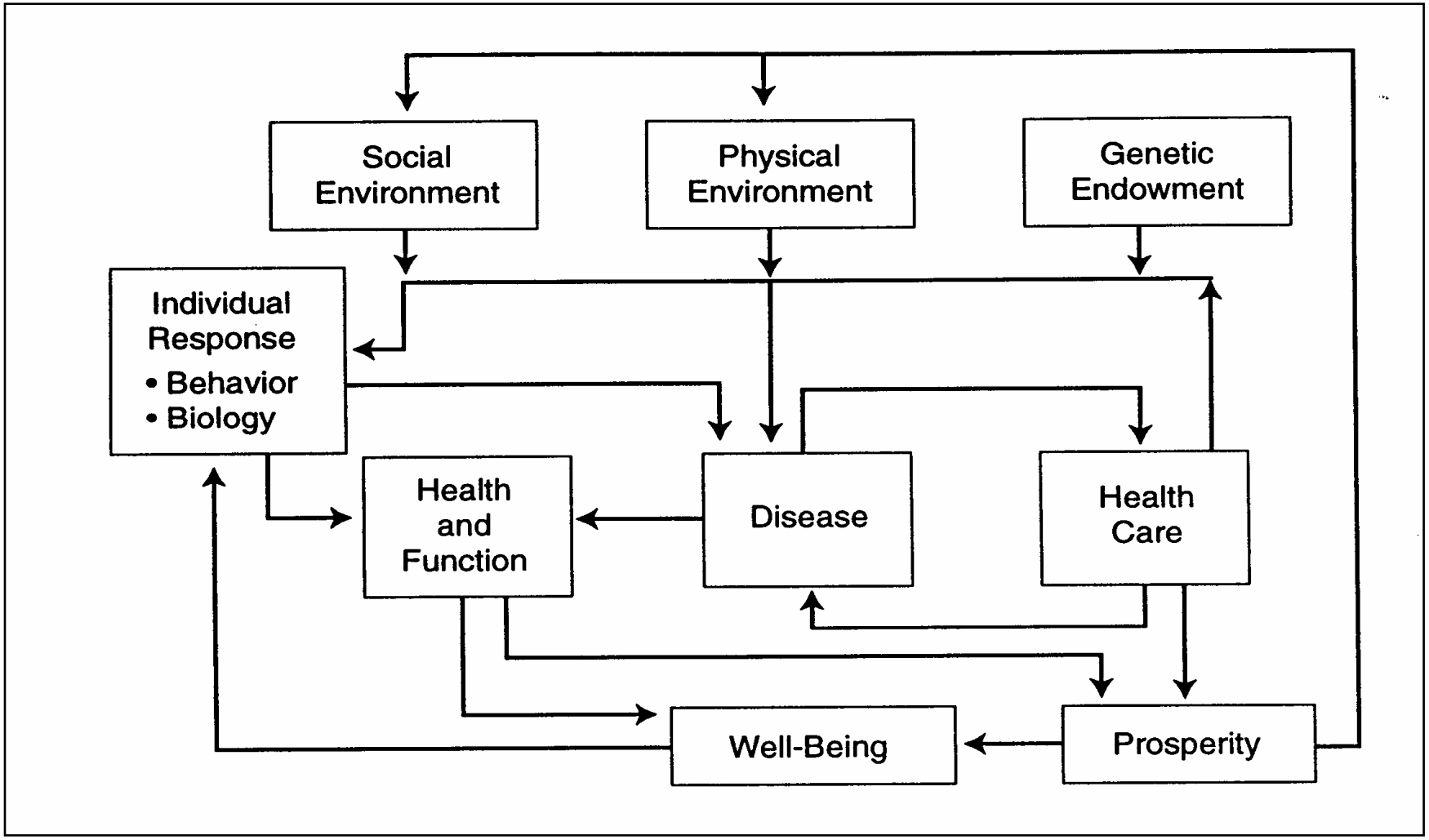
IOM: *The Future of the Public's Health in the 21st Century*

- Public health: What society does collectively to assure the conditions for people to be healthy
- Multiple determinants of health
  - Health of populations and individuals is shaped by a wide range of factors in the social, economic, natural, built, and political environments
  - Health care services and biomedical technologies can generally address only the immediate causes of disease
  - Healthy policies address education, adequate housing, a living wage, clean air, socio-economic inequalities, etc.

The Public Health System



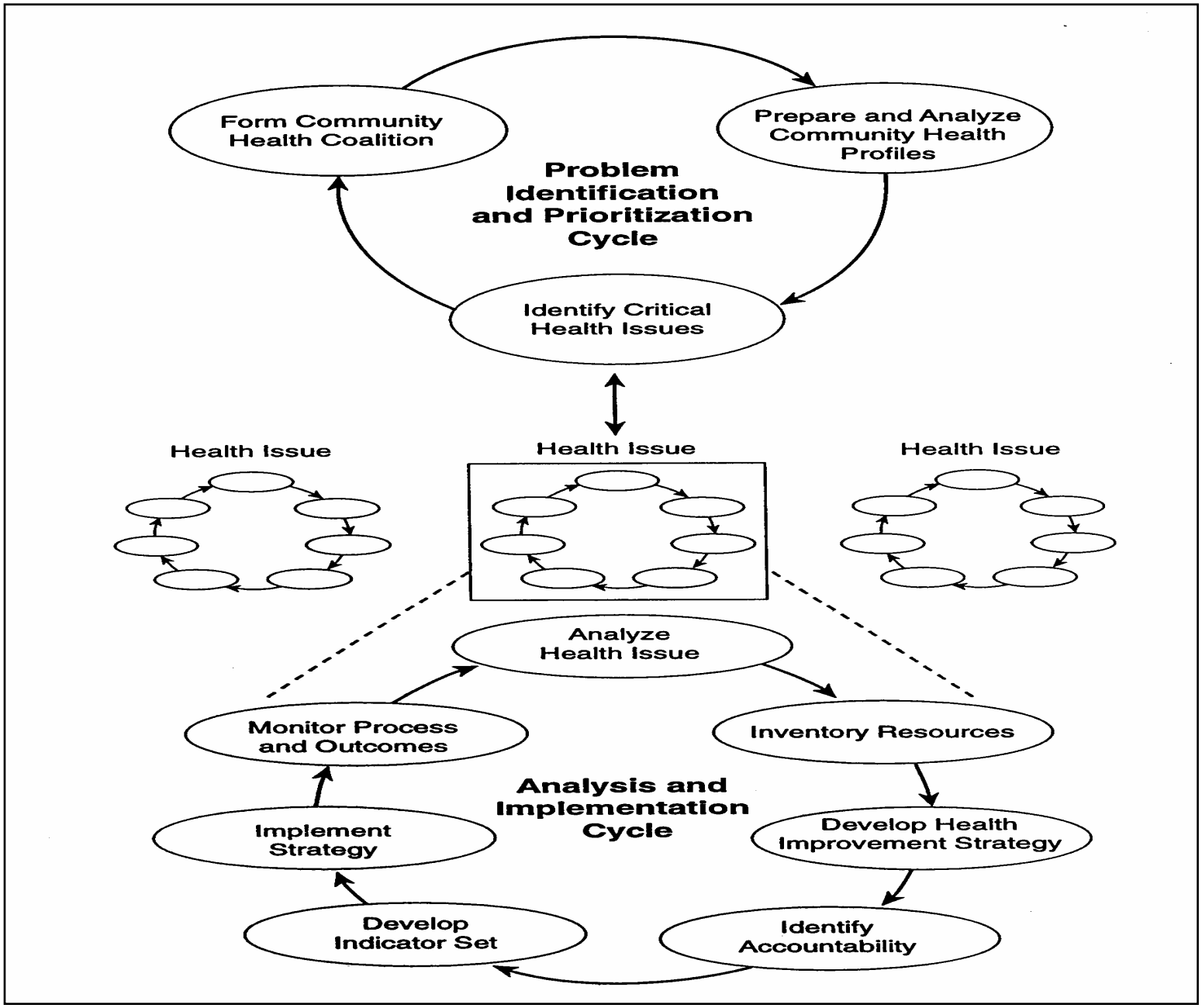
Evans and Stoddart "Field Model"



IOM Community Health Improvement Process (CHIP)

Improving Health in the Community, IOM, 1997

- **The community's health depends on the interaction of many factors, entities, organizations, and interests in the community**
- **Community health is a** ***shared responsibility***
  - **Community health assessment**
- **Specific entities in the community must be** ***accountable*** **for the actions that they can take to improve community health**
  - **Entity-specific performance measures**


Form Community Health Coalition
Prepare and Analyze Community Health Profiles
Problem Identification and Prioritization Cycle
Identify Critical Health Issues
Health Issue
Health Issue
Health Issue
Analyze Health Issue
Monitor Process and Outcomes
Inventory Resources
Analysis and Implementation Cycle
Implement Strategy
Develop Health Improvement Strategy
Develop Indicator Set
Identify Accountability

MAPP: Mobilizing for Action through Planning and Partnerships

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- ***Performance measurement***
  - ***Principles***
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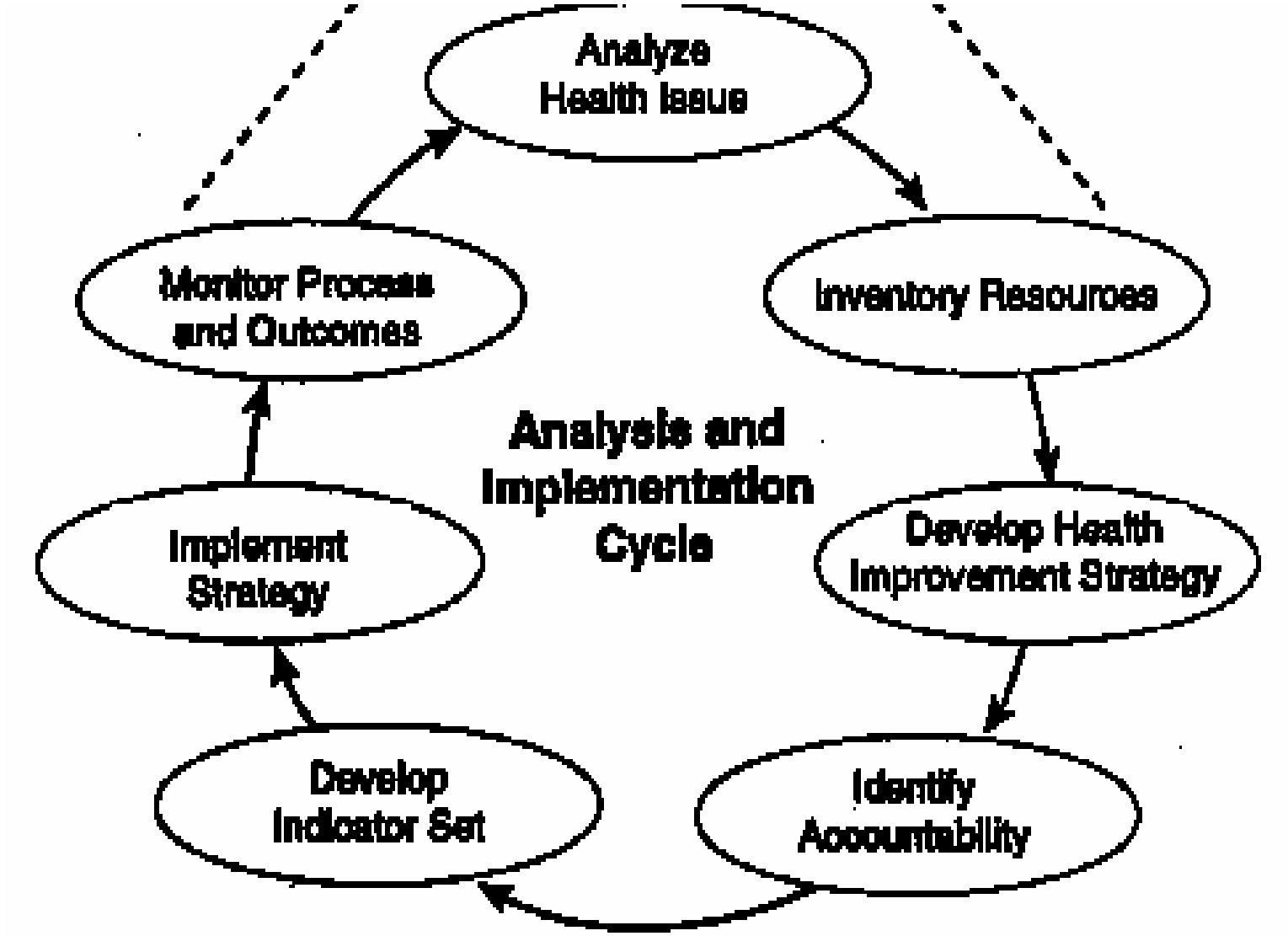
Measurement theory & methods

Steps for developing measures

1. ***Clarify the purpose of measurement***
2. Identify the concepts to be measured
3. Identify specific indicators of these concepts
4. Assess validity, reliability, practicality, and utility


Analyze
Health Issue
Inventory Resources
Develop Health
Improvement Strategy
Identify
Accountability
Develop
Indicator Set
Implement
Strategy
Monitor Process
and Outcomes
Analysis and
Implementation
Cycle

Measurement theory & methods

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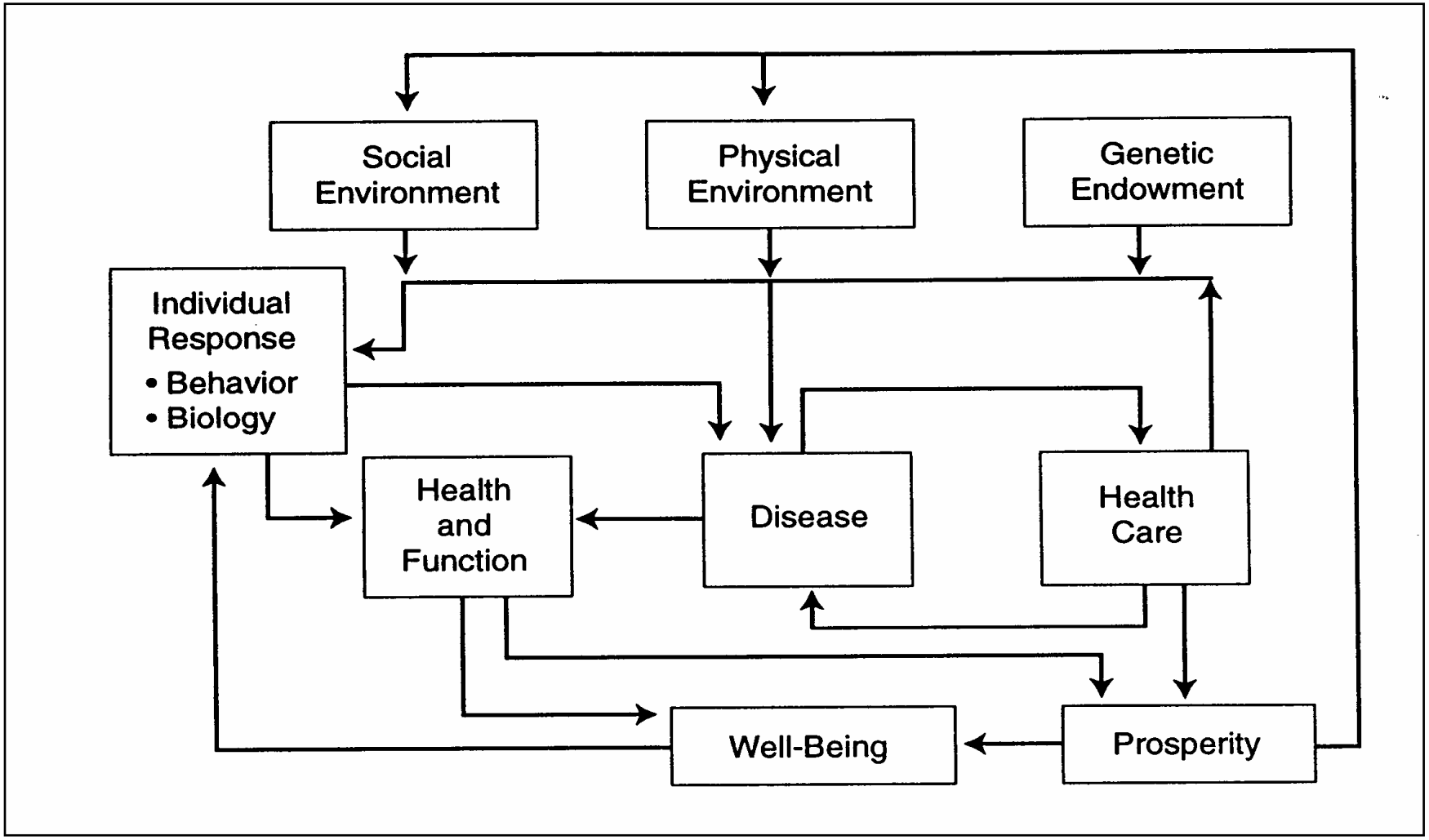

Measurement theory & methods

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Concepts vs. indicators

Concept	**Indicator or measure**
Mortality	Disease specific mortality rate
Presence of disease	Disease prevalence rate
Health risks	Risk factor prevalence rate
Costs	Treatment costs per patient
Quality	Patient satisfaction ratings
Access	Percent of population with health insurance

Data sources for performance measures

- Census
  - SES, education, income
  - housing, commuting patterns
- Vital statistics
  - maternal and infant mortality
  - birth certificate information
    - prenatal care
    - low birthweight births
  - teenage fertility rate
  - motor vehicle crash deaths
  - suicide deaths among youths

Data sources for performance measures

- Surveillance data
  - active vs. passive
- Special purpose surveys
  - immunization coverage
  - children with health insurance
- General health survey
  - BRFSS
- Program data
  - Title V, other MCH, other programs
  - Newborn screening

Measurement theory & methods

Steps for developing measures

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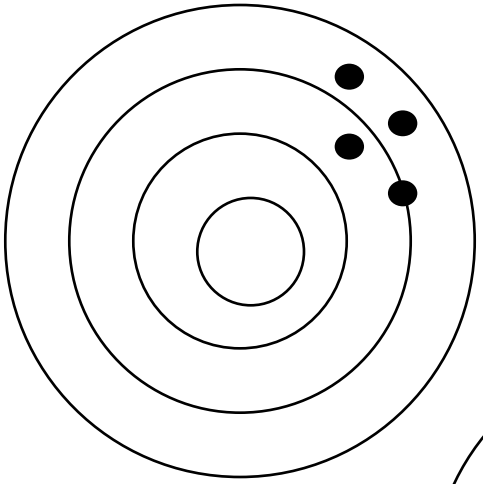
3. Identify specific indicators of these concepts
4. ***Assess validity, reliability, practicality, and utility***

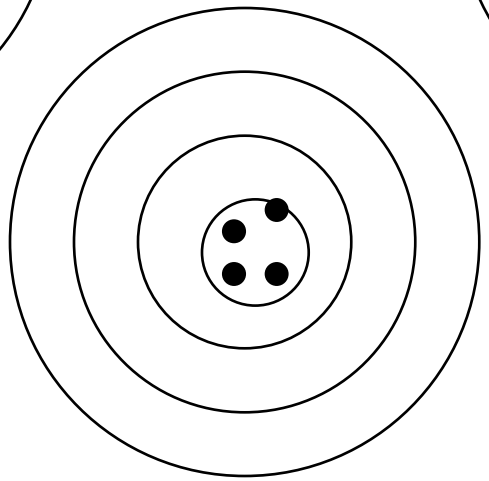
Assess the proposed measures

- Validity
  - is the indicator measuring the **right concept**?
- Reliability
  - is the indicator **consistently** measuring the concept?
  - Is measurement error small compared to population variability?
- Robustness and responsiveness to change
  - will the indicator change if and only if the concept being measured changes?

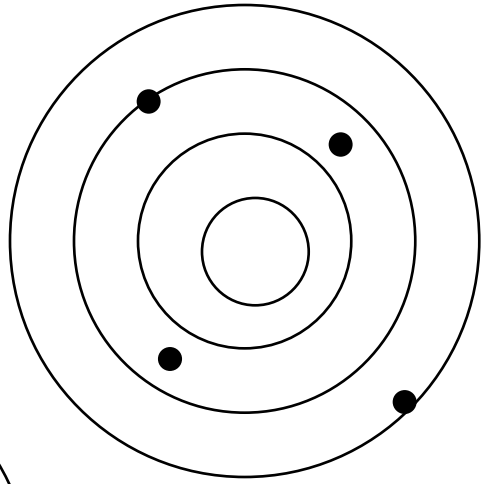
Reliability and validity



Reliable



Reliable and valid



Valid

Performance measurement principles

- Proceed from clearly defined goals and be seen as tools to promote progress toward these goals
- Structure, process, and outcome measures
- Performance measure characteristics
  - agreed-on definitions
  - valid, reliable, responsive to change
  - adaptable and consistent across different uses
  - evaluated periodically to ensure continued appropriateness and usefulness
- Feasibility and cost of data collection
- Developmental and evolving activity

Performance measurement in population health

- “Community health report card” advantages
  - encourage continuous improvement rather than set floors or ceilings
  - motivate performance through benchmarking and comparison with peers
  - enable aggregate performance measures across a group of organizations in the community
- Promote collaboration and information sharing rather than competition

Population health measurement issues

- Consideration of health field model
- Engage stakeholders
- Established validity and reliability
- Evidence-based link between performance and health
- Responsibility and accountability for performance
- Timely availability of data at a reasonable cost
- Inclusion in other indicator sets
- Robustness and responsiveness to change

Outline

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- Performance measurement
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  - ***Healthcare examples***
  - Application to population health
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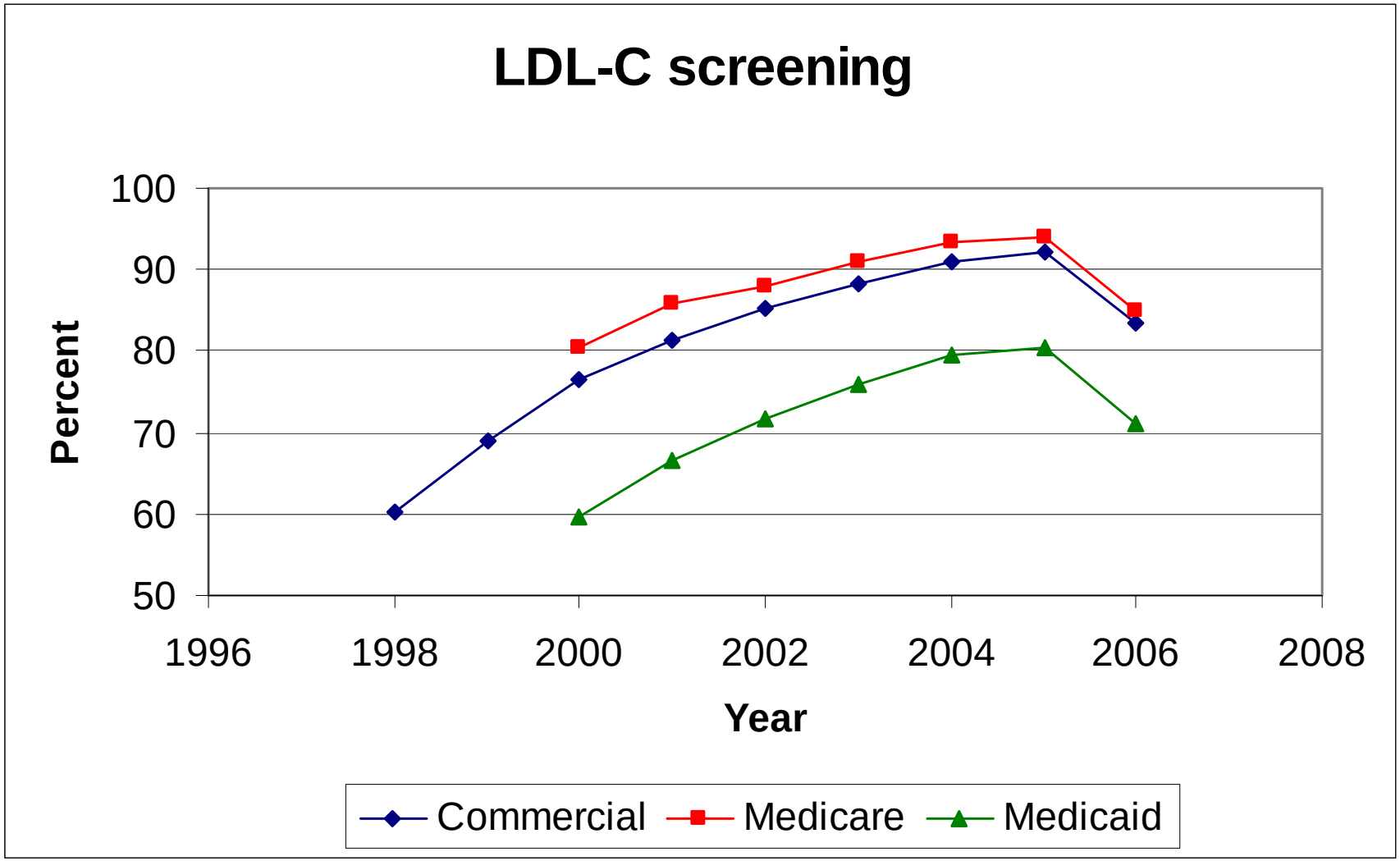
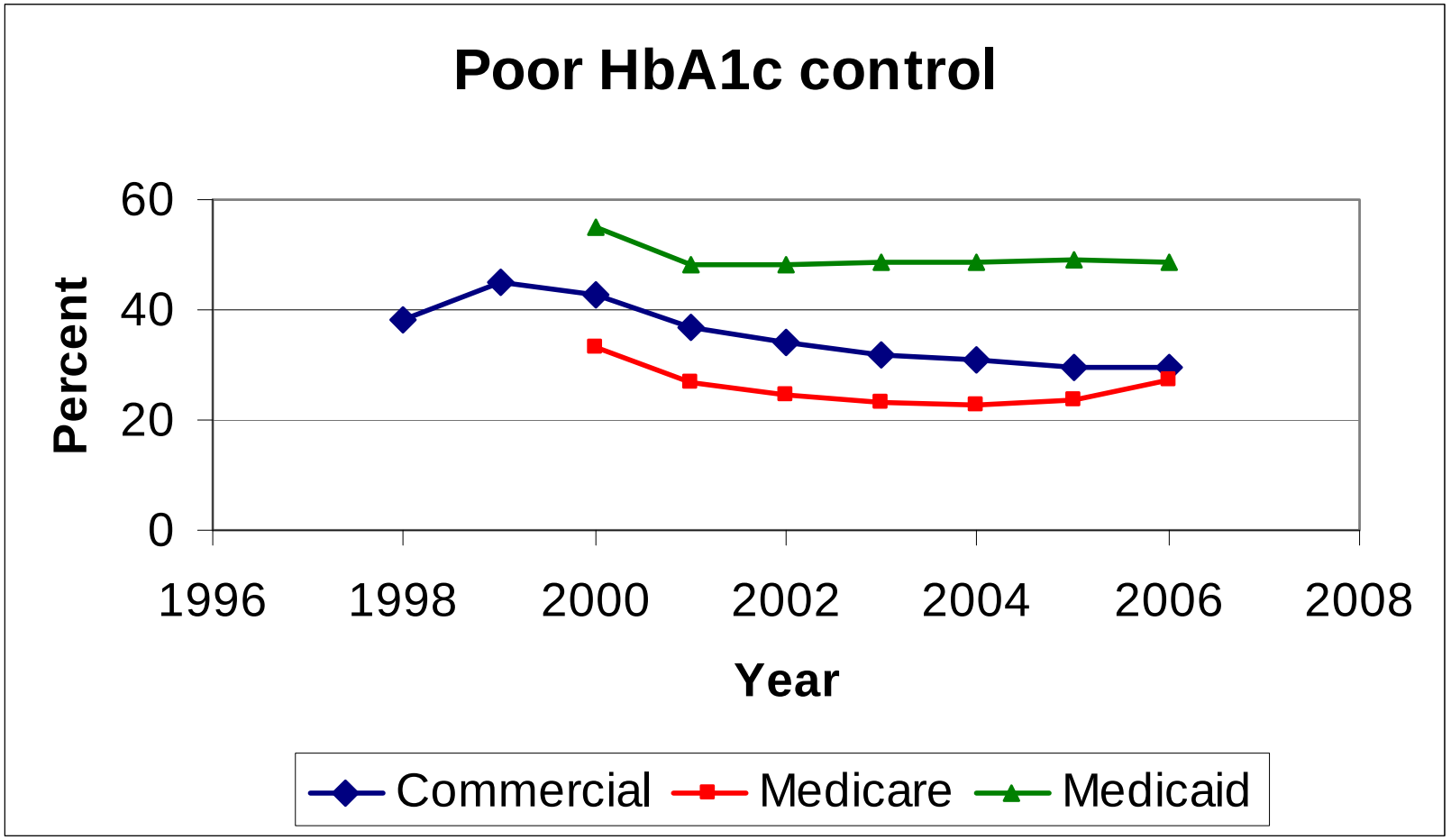
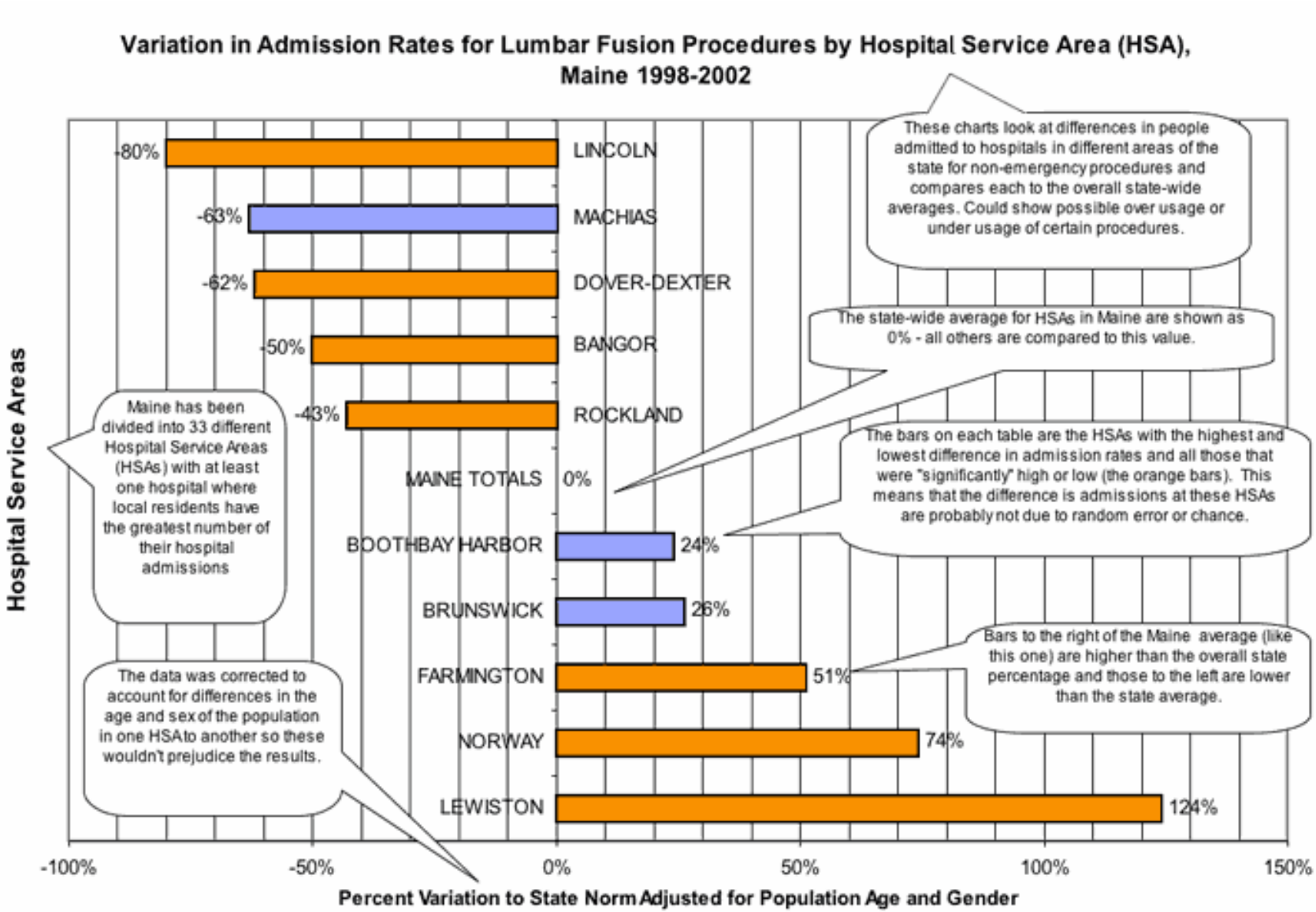
National HEDIS measures



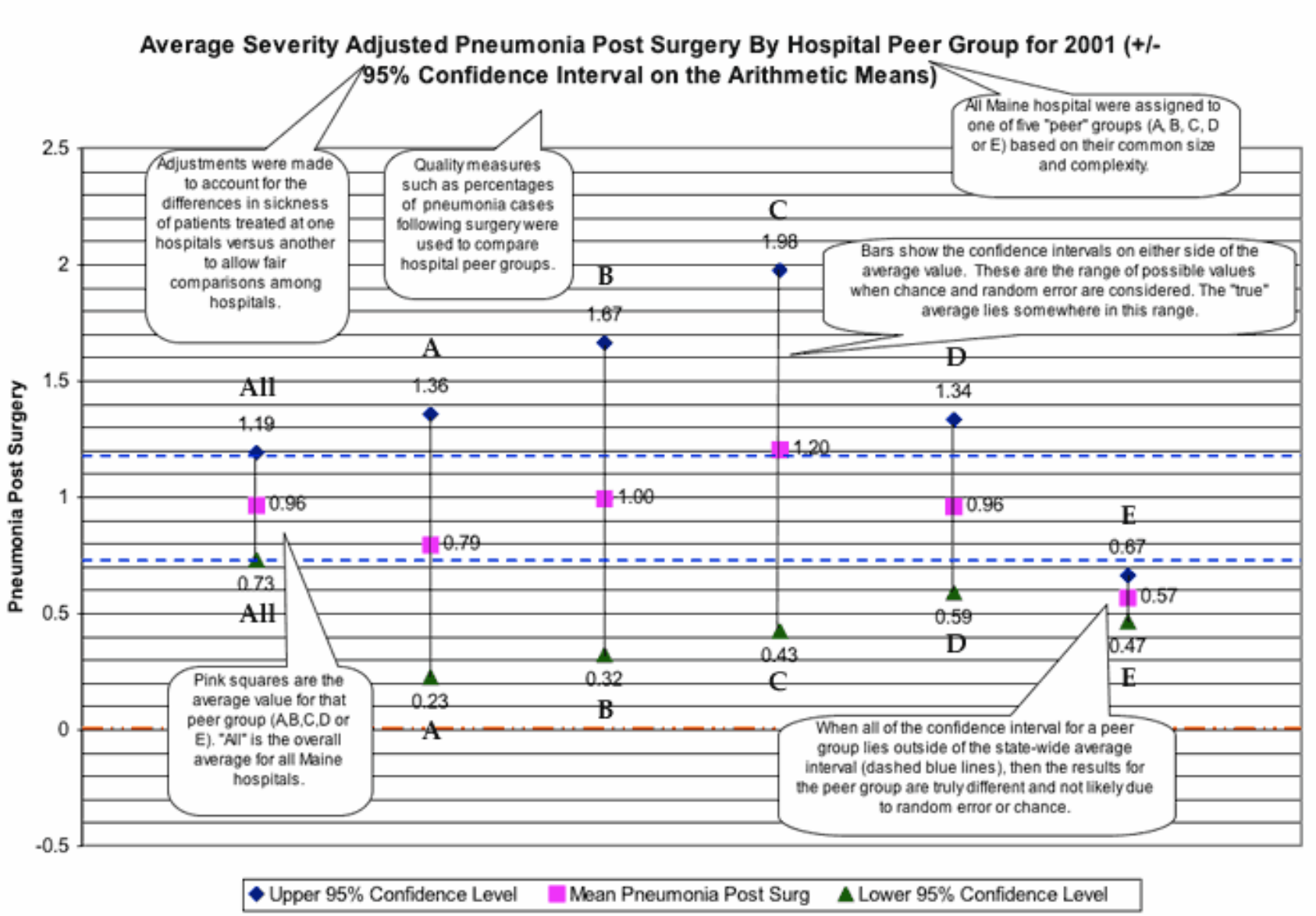
National HEDIS measures



Maine Quality Forum
Medical variation chart format



Maine Quality Forum
Quality analysis chart format



DHHS Hospital Compare site

www.hospitalcompare.hhs.gov

- Hospital process of care measures
  - Surgical infections prevention
    - % of surgery patients who received preventative antibiotics 1 hour before incision
  - Heart attack
    - % of heart attack patients given aspirin at arrival
- Hospital outcome of care measures
    - Adjusted adult heart attack death rates
- Survey of patients' hospital experiences
    - % of patients who reported that their doctors “always" communicated well
    - % of patients who gave their hospital a rating of 9 or 10 on a scale from 0 to 10

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  - ***Application to population health***
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What can a community do to prevent and control diabetes?

- Prevention
  - Reduce the prevalence of obesity by encouraging and enabling healthy lifestyles
    - Especially physical activity and diet
  - Screen the population to identify those with diabetes as early as possible so they can get treatment
- Health care
  - Provide quality care for those with diabetes
  - Improve access to and cost of that care

Sample performance indicator set *Diabetes prevention*

- % of adult population who have been
  - tested for diabetes
  - who have been told they have diabetes
- Availability of parks, trails, sidewalks, etc.
- Physical education in the schools
- School-based obesity screening
- Availability of healthy alternative foods
- Obesity counseling by health care providers
- Availability of weight-loss programs
- Health plan coverage for weight-loss programs
- Registry of people with elevated A1c test results

National Diabetes Quality Improvement Alliance *Performance measurement set for adult diabetes*

Concept	***Measure*** (per year, denominator = all diabetes patients aged 18-75)
Intensive therapy of hemoglobin A1c	• % of patients with ≥ 1 A1c test • % of patients with most recent A1c > 9%
Lowering serum cholesterol	• % of patients with ≥ 1 LDL-C test • % of patients with LDL-C < 130 mg/dl
Early detection of ESRD	• % of patients with ≥ 1 microalbumin test
Early detection of retinopathy	• % of patients with standard eye exam (ok in previous year if low risk)
Prevention of foot ulcers/amputations	• % of patients with foot exam

National Diabetes Quality Improvement Alliance
Performance measurement set for adult diabetes

Concept	***Measure*** (per year, denominator = all diabetes patients aged 18-75)
Lowering influenza risk	•% of patients receiving influenza vaccine
Blood pressure control	•% of patients with most recent blood pressure < 140/80 mm Hg
Prevention of cardiovascular events	•% of patients receiving aspirin therapy (dose ≥ 75 mg/day)
Smoking cessation	•% of patients whose smoking status was ascertained and documented annually

Other possible measures of quality of diabetes care

- Donabedian measures
  - Structure
    - Availability of knowledgeable providers, testing equipment, vaccines, etc.
  - Process
    - % of patients with > 1 A1c test
  - Outcomes
    - % of patients with most recent A1c > 9%
    - Patient satisfaction

Sample performance indicator set
Vaccine-preventable disease

- Immunization rate for
  - all children at 24 months
  - children in managed care organizations
  - children in Medicaid
- Full insurance coverage for immunizations
- Pneumonia/influenza in 65+ population
  - immunization coverage
  - death rate
- Existence of community immunization registry
- Existence of active community immunization coalition

Sample performance indicator set *Tobacco and health*

- Deaths from tobacco-related conditions
- Smoking-related residential fires
- Prevalence of smoking
- Initiation of smoking among youth
- Ordinances to control ETS
- Local enforcement of laws on tobacco sales to youth
- Tobacco use prevention in school curricula
- Counseling by health care providers
- Availability of cessation programs
- Health plan coverage for cessation programs

Measurement issues

- Consideration of health field model
- Engage a variety of stakeholders
- Established validity and reliability
- Evidence-based link between performance and health
- Responsibility and accountability for performance
- Timely availability of data at a reasonable cost
- Inclusion in other indicator sets
- Robustness and responsiveness to change

Outline

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Exercise

- Develop a performance indicator set
  - Identify the community
  - Choose a topic of interest
  - Identify actions to be included
  - Identify responsible parties
  - Choose indicators or measures
    - from DHHS District Health Profiles
    - Other data sources as needed

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Challenges in assessing preparedness

- Public health emergencies are rare
  - Can't measure outcomes directly
  - Hard to learn from experience about what "works"
- Effective response is complex and multi-factorial
  - Public health "system" is fragmented
    - City, county, regional, and state departments
    - Partners that are not formally public health agencies (health care, schools, EMS, media, …)
  - What is effective and needs to be done?
    - Who's responsible for what?

Measurement Approaches

- Informed judgment

  Are you prepared?

- Standards-based assessments

  Did you do what's recommended?

- Proxy events

  How did it go?

- Drills and exercises

  How would it go?

Capacity building

Must be built now to enable an effective emergency response

Functional capabilities

Capabilities needed during an emergency

Using drills and exercises to measure preparedness

- Examples
  - Strategic National Stockpile drills; 24/7 calls
  - Tabletops (TTX) designed for evaluation
- Strengths
  - Simulate events of concern
  - Control and standardization possible
  - Can address institutional knowledge, thinking, and overall response and specific capabilities
- Weaknesses
  - Lack of realism or perceived relevance
  - Lack of clear performance standards
  - Requires subjective assessment of high order response

Checklist for pandemic flu TTX

- Domains
  - Surveillance and epidemiology
  - Disease control and prevention
  - Mass care
  - Communication within the “public health system” (broadly defined)
  - Communication with the public
  - Leadership and management

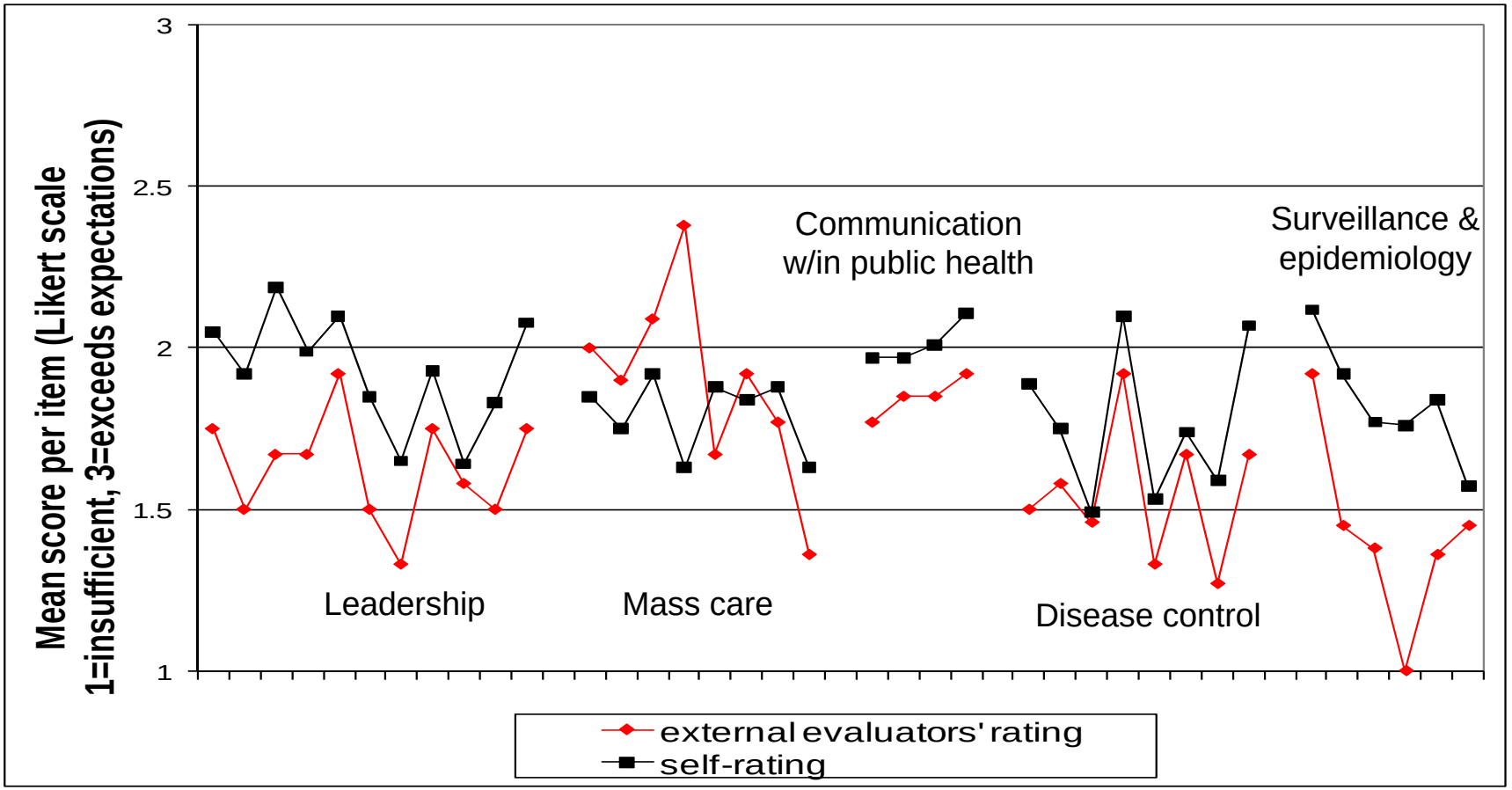
Surveillance and epidemiology

- Receive and respond to urgent case reports
- Investigate and track reported cases
- Track information (i.e. newly hospitalized cases, newly quarantined cases) for policy makers
- Laboratory capacity (i.e. rapid identification of unusual influenza strains), including ability to ship specimens to state or CDC lab
- Link with and share data among different surveillance systems (e.g. state DOH, CDC, other communities and states, local hospitals, etc.)
- Step up surveillance systems in time to initiate containment protocols

Disease control and prevention

- Legal authorities regarding isolation and quarantine
- Procedures to manage isolation and quarantine
- Capability to
  - Support people in quarantine
  - Develop infection control policies and disseminate them to health care providers
  - Implement community interventions
  - Conduct mass screening
  - Distribute limited medical supplies to priority groups
  - Control population movement in and out of the community

Correspondence between external and self-evaluations



Savoia et al., 2007 APHA meeting

Big Ideas

- Performance measures hold specific entities accountable for actions that they can take to improve community health
- Key characteristics
  - Accountable entity identified
  - Balance structure, process, and outcome measures
  - Evidence-based link between performance and health
  - Validity, reliability, and sensitivity to change

References

- Evans RG, Stoddart GL. Producing health, consuming health care. In *Why are Some People Healthy and Others Not? The Determinants of Health of Populations*, Evans RG, Barer ML, Marmor TR, eds. Aldine De Gruyter, 1994.
- Institute of Medicine. *Improving health in the community: A role for performance monitoring*. Durch JS, Bailey LA, Stoto MA, eds. National Academy Press, 1997.
- Institute of Medicine. *The Future of the Public's Health in the 21st Century*. National Academy Press, 2003.
- Kindig DA. Purchasing population health: Paying for results. The University of Michigan Press, 1997.
- NCQA, *The State of Health Care Quality 2007*, 2008. Available at: http://ncqa.org/tabid/543/Default.aspx
- Stoto MA, Cosler LE. Evaluation. In Novick L, Mays G, eds., *Public Health Administration: Organization and Strategy for Population-based Management*, 2nd Edition, Jones and Bartlett, 2007.
- UK NHS Institute for Innovation and Improvement, *The Good Indicators Guide: Understanding How to Use and Choose Indicators*, 2008. Available at: www.apho.org.uk/resource/item.aspx?RID=44584

Data resources

- Maine
- DHHS District Health Profiles www.maine.gov/dhhs/boh/maine_dhhs_district_health_profiles.htm
- Maine CDC www.maine.gov/dhhs/boh/data_resources.htm
- Maine Quality Forum www.mainequalityforum.gov/mqsp01f.html

- Centers for Disease Control and Prevention
- National Center for Health Statistics www.cdc.gov/nchs/
- CDC Wonder wonder.cdc.gov/
- Behavioral Risk Factor Surveillance System www.cdc.gov/brfss/

- Other federal sources
- Agency for Healthcare Research and Policy www.ahrq.gov/data/
- Health Resources and Services Administration datawarehouse.hrsa.gov/
- Centers for Medicare & Medicaid Services www.hospitalcompare.hhs.gov
- National Cancer Institute www.cancer.gov/statistics/
- U.S. Census Bureau, American FactFinder
- factfinder.census.gov/home/saff/main.html?%20Lang=en