

Population Health and Its Implications for Health Statistics

Barbara Starfield, MD, MPH

NCVHS, Washington, DC
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Challenges of 21st Century Health Systems

- The poor and worsening position of US population health indicators
- Quality of health services
 - Responsiveness to needs
 - Co-morbidity
 - Coordination of care
 - Overuse
- Quality of health systems
 - Population outcomes
 - Disparities (inequities)

Is population health the sum
of individual health?

Distinction between focus on individuals and populations or subpopulations is at the heart of distinctions among the branches of medicine.

Clinical Medicine

What disease might this patient have, and how should it be managed?

Clinical Epidemiology

What is the relative likelihood that this patient has, or is at risk for, this disease, and what is the evidence to support its management?

Social Medicine

Why does this patient have this disease at this particular time, and how might this affect management?

Community Medicine

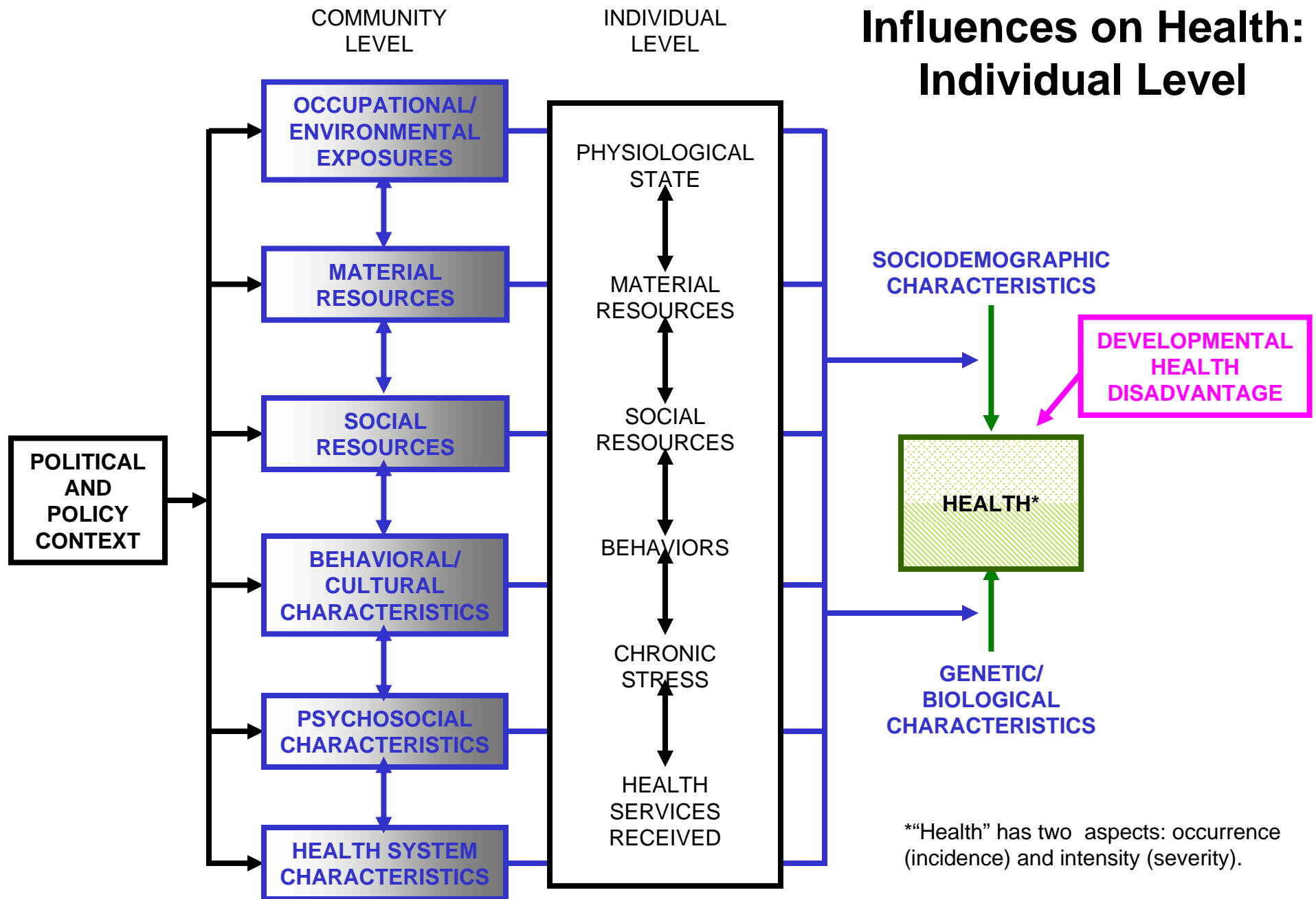
Is this disease important? If so, how important is it, to whom, and what is the overall benefit of management to the community?

Public Health

What characteristics are most salient in improving overall health and the distribution of health in populations, and what does evidence suggest should be priorities for intervention?

Clinical, Epidemiological, and Social Views towards Health

Influences on Health: Individual Level

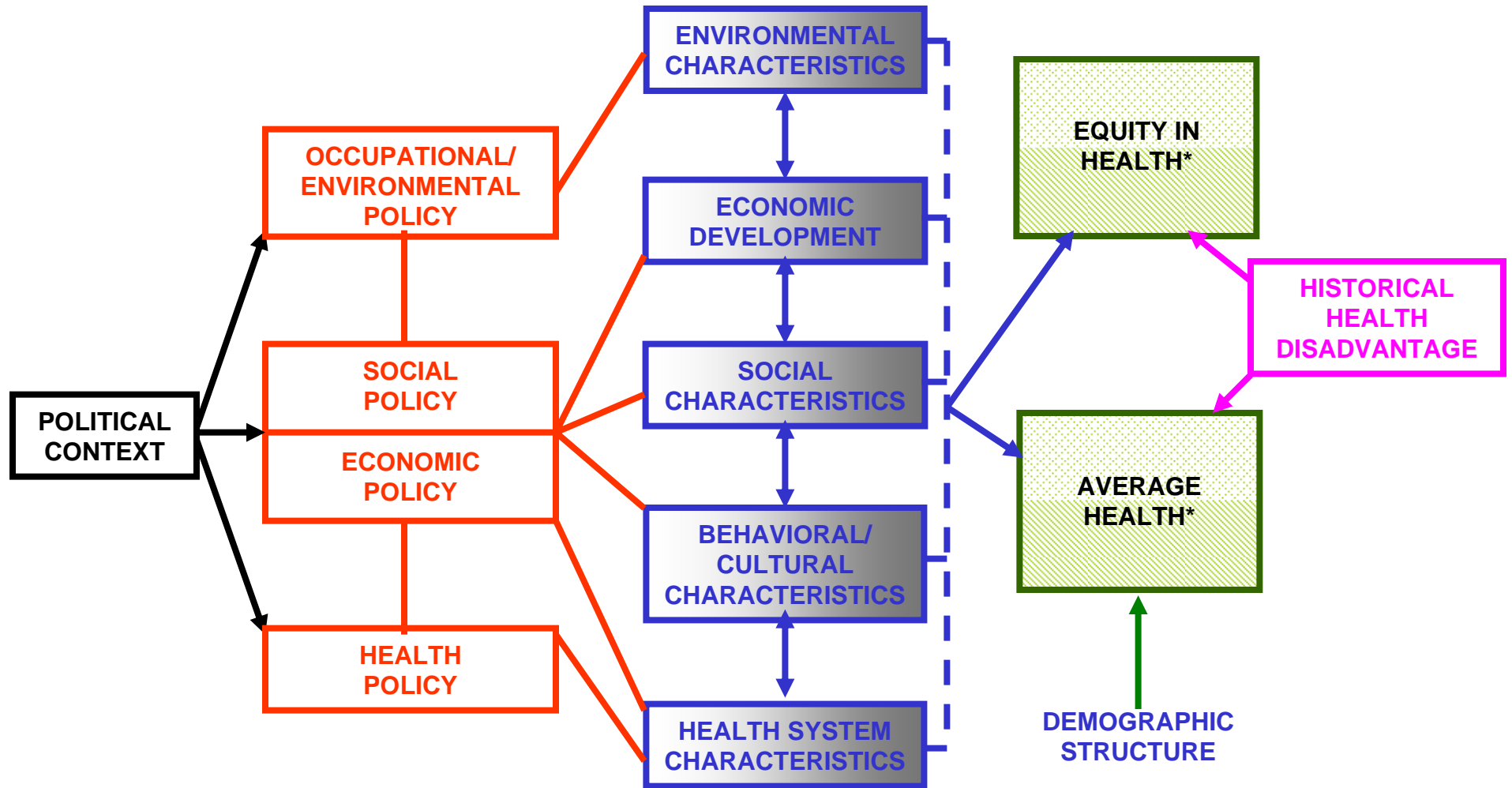


*"Health" has two aspects: occurrence (incidence) and intensity (severity).

Shading represents degree to which characteristics are measured at the ecological level (lighter color) or at the individual level aggregated to community.

Community Medicine and Public Health Views towards Health

Influences on Health: Population Level



Dashed lines indicate the existence of pathways through individual-level characteristics that most proximately influence health.

Shading represents degree to which characteristics are measured at the ecological level (lighter color) or at the individual level aggregated to community.

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Implications for Data/Information Systems: I. Linkages

- Linking individual/aggregated individual data with contextual/ecological data
i.e., clinical approaches with systems approaches

Implications for Data/Information Systems: II. Areas

- Characteristics of areas in which people live and work
- Social and political (power) characteristics of the people in an area
- Characteristics of health system

Implications for Data/Information Systems: III. Health Services

- Problems (ICPC)
- Diagnoses (co-morbid diagnoses)
- Management (disease or morbidity-oriented?)
- Reassessment (disease or problem-oriented?)

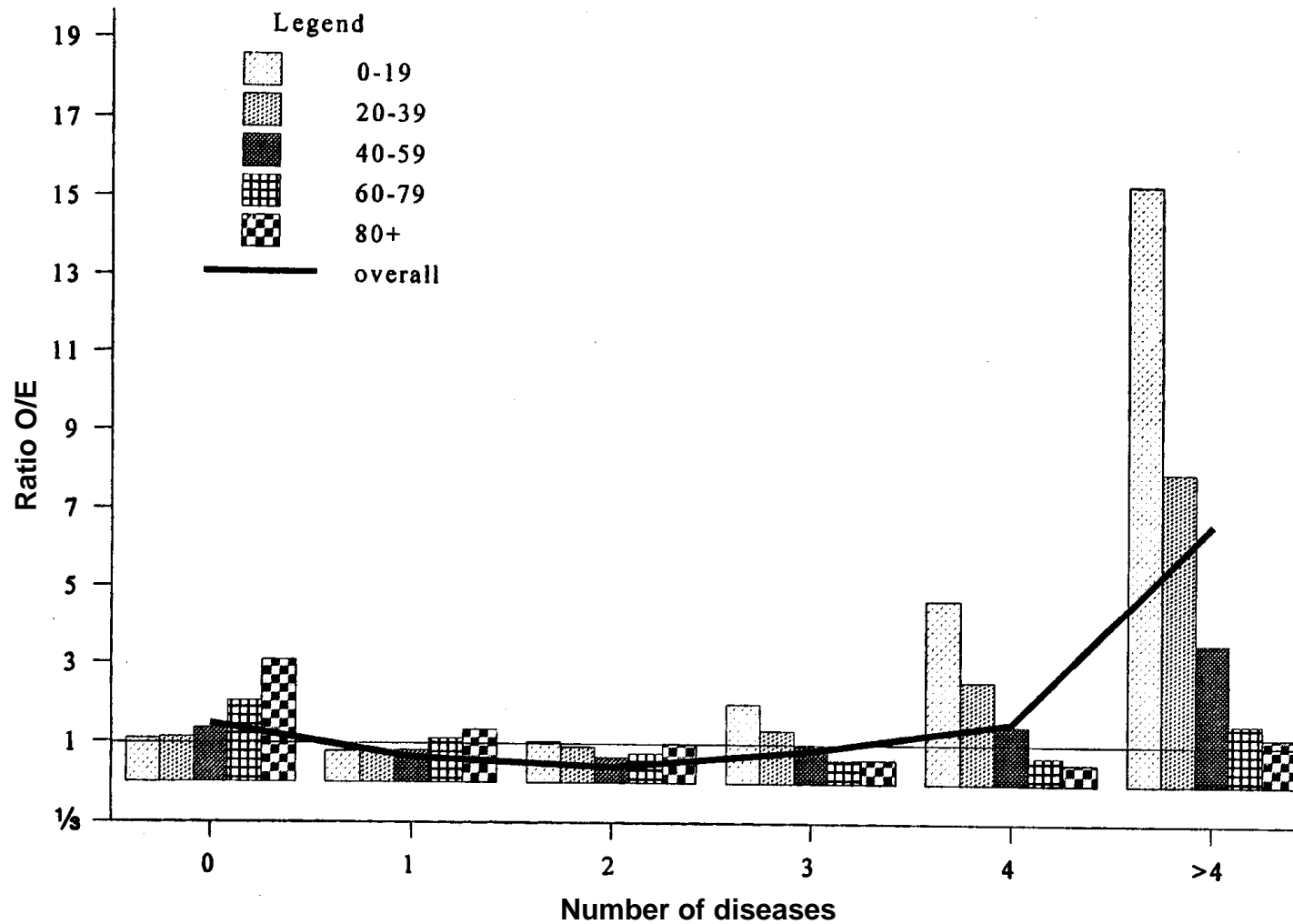
Implications for Data/Information Systems: IV. Disease, Morbidity, or Health Oriented?

- Co-morbidity
- Concept of health

Co-morbidity

Diseases, risk factors, and influences are not independent of one another. Data systems must allow for coordination among different providers and types of providers.

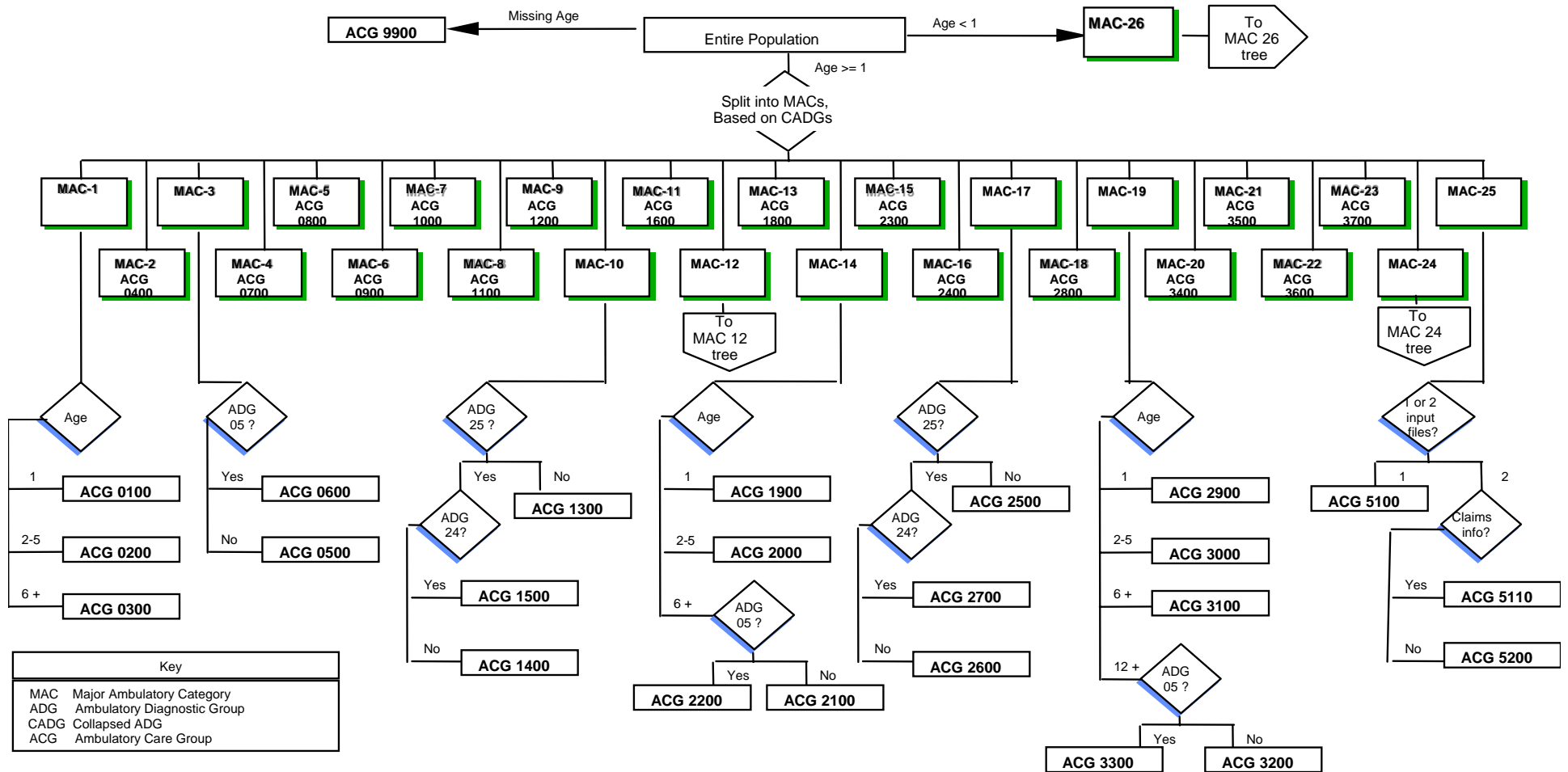
Ratios of Observed and Expected (Co-)Occurrences of Diseases, Overall and for Different Ages



Source: van den Akker et al, 1998

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Decision Tree for ACGs



What Is Health?

Health is the extent to which an individual or group is able, on the one hand, to realize aspirations and satisfy needs and, on the other hand, to cope with the interpersonal, social, biological, and physical environments. It is a resource for everyday life, not the objective of living; it is a positive concept embracing social and personal resources as well as physical and psychological capacities.

How Is Population Health Measured?

Infant mortality rates vs. neonatal and postneonatal

Mortality rates vs. age-adjusted mortality rates

Cause-specific mortality

Life expectancy

Years of potential life lost

(GAO choice among 17)

Disease occurrence/severity

All diseases

Target diseases

(Popular in US and worldwide)

Self-reported health

DALYs

Which of these represent health?

Alternatives for Characterizing Population Health

1. Diagnosed morbidity case mix by age
2. DALYs
3. Profiles of health derived from combinations of separate domains

Criteria for Defining Profile Types

Profile	Type	Criteria
A	Excellent health	Excellent health on 3 or 4 domains, with no domains of poor health
B	Good health	At least average health on all domains, with excellent health on no more than 2 domains
C	Dissatisfied	Poor health only on satisfaction
D	Discomfort	Poor health only on discomfort
E	Low resilience	Poor health only on resilience
F	High risks	Poor health only on risks
G	Dissatisfied/high discomfort	Poor health on satisfaction & discomfort
H	Dissatisfied/low resilience	Poor health on satisfaction & resilience
I	Dissatisfied/high risks	Poor health on satisfaction & risks
J	Discomfort/low resilience	Poor health on discomfort & resilience
K	Discomfort/high risks	Poor health on discomfort & risks
L	Low resilience/high risks	Poor health on resilience & risks
M	Worst health	Poor health on 3 or 4 domains

Dealing with Disparities

Stratified analysis
rather than statistical
adjustment

Social and Political Context

Important future direction
to understanding the
variety of influences on
health

Directions for Population Health Data

Information systems moving towards characterizing

- Health
- Contexts
- Co-morbidity as well as disease
- Disparities (systematic differences)
- Bridging clinical medicine and public health to use knowledge about health, risks, and resiliencies

Summary: Health

Population health is NOT the sum of individual health. Averages do not represent population health or provide information about the context in which systematic differences in health occur and how they can be remedied.

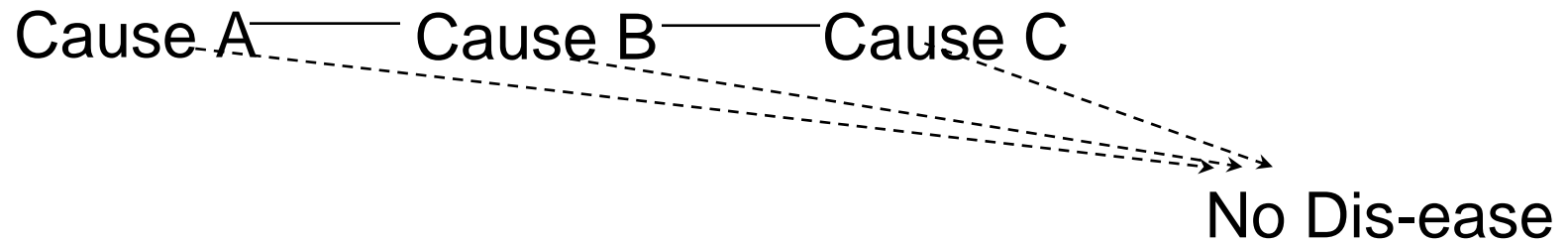
Summary: Why Population Health Is NOT the Sum of Individual Health, in Any Useful Sense

- Co-morbidity: individual measures of health do not represent health
- Non-random distribution of health, e.g., age, geography, societal differences cause systematic differences in population subgroups

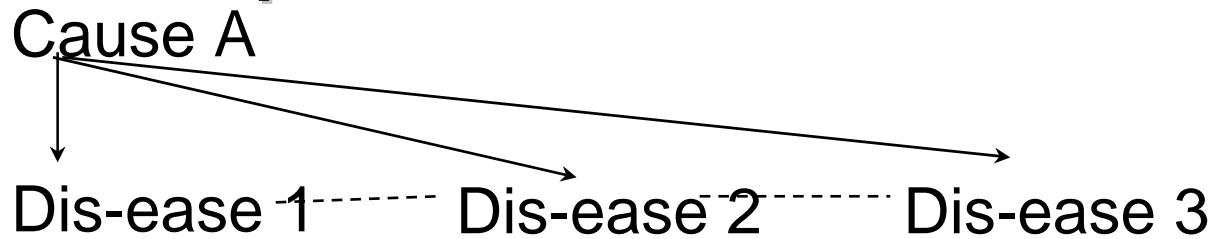
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If interest is in reducing ill health and/or promoting health, attention shifts to understanding influences on health and clustering of ill health.

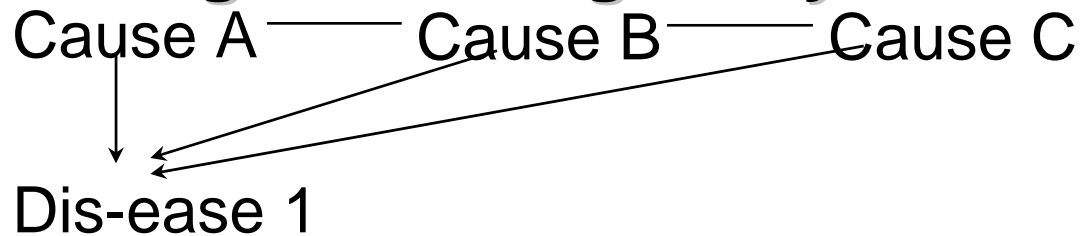
Penetrance



Pleiotropism



Etiologic Heterogeneity



Data Systems for Bridging Public Health and Clinical Medicine

Boundaries between public health and clinical medicine are fluid. Data systems are needed to coordinate the activities of both sectors.

Population health is not the sum of any individual measure of health because of

NON-RANDOM DISTRIBUTION OF HEALTH AND INFLUENCES ON HEALTH

- Age and gender distributions
- Political/economic/social/environmental contexts

INDIVIDUAL MEASURES OF HEALTH DO NOT REPRESENT HEALTH.