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HOW DO YOU DEFINE THE HEALTH OF POPULATIONS?

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HEALTH OF POPULATIONS

Key Concepts: Health of Populations/How do You Define Health?/Health Adjusted Life Expectancy (HALE)/Perceptions of Population Health/Potential Measures of Population Health

What are the perceptions of population health, and how do you define it to move forward on any common action agenda of policy, management, teaching, or research? The author asks a series of questions to clarify the ambiguities around the population health concept, beginning with defining "health" as more than the absence of disease, but less than the breadth of complete well-being. Such a framework requires an operational measure of population health outcome that goes beyond quantity of life (mortality) to add extra dimensions. In other words, the goal is not only to purchase life years, but life years at some level of quality. The article provides an argument for the importance of some aggregate measure of health outcome, such as Health Adjusted Life Expectancy (HALE), as a management tool for purchasing population health.

The concept of population health is broad, not clearly defined, and therefore has different meanings to various persons or groups. This lack of definition may serve a purpose, in that it allows the term to be used in a general way with a perceived common identification and understanding. On the other hand, the appearance of unity, which can be fragmented when moving from the general to the distinct, is problematic, since any common action agenda of policy, management, teaching, or

research will be weakened as deeper understanding occurs through program specification. This article attempts one conceptualization of population health that may be useful in developing such an action agenda in the early decades of the 21st Century.

Perceptions of population health

There are several current implicit definitions of population health:

1. Health promotion and disease prevention. This may be the most common view, since many of these activities are focused on population-based interventions, such as mass health education strategies or programs, including fluoridation or air and water quality efforts.

2. Primary care. This perspective is related to health promotion and disease prevention, except that it focuses more on the personal medical care services provided in primary care settings by such providers. In large part, this approach emphasizes first contact and ongoing medical treatment for common diseases, often involving screening and treatment for preventing illness and reducing morbidity and disability.

3. Public Health. While there is an obvious semantic relationship to the term population health, the definition of public health is being debated. The Institute of Medicine (IOM) defined the mission of public health as "fulfilling society's interest in assuring conditions in which people can be healthy." [1] But the Dean of Johns Hopkins School of Public Health, Al Sommer, recently observed that the IOM report fostered a restrictive public health agency interpretation that "carries too much baggage;" he urges a definition that is instead a "complex, diverse, integrated, and dynamic enterprise, composed of many disciplines, whose goal is protecting and improving the health of the public." Sommer also notes that the job of public health in the evolving capitated system is to "ensure that everyone's health should be maximized." [2]

First, what is health?

What is health? Answering this question is a challenge. Concepts and definitions range from the broadly philosophical to the narrowly statistical. Part of the complexity stems from the everyday usage of the word. To most of us, being healthy or unhealthy is a part of life's routine, and is most often related in our minds to the presence or absence of disease. In a frequently quoted statement, the World Health Organization defines health as "complete physical, mental, and social well-being, and not merely the absence of disease or injury." [3] While this has often been criticized for its breadth and the difficulties it poses, both in terms of measurement and achievement, the dictionary definition is similarly broad, citing "sound physical or mental condition."

There is no precise solution to this issue, but modern thinking does support a concept of health that

is more than the absence of disease, but less than the breadth of complete well-being. An important component is that of function-being able to perform, not only physically and mentally, but in social and occupational roles, as well.

In clarifying the definition of health, Evans and Stoddart[4] have presented a more complex model of health and its determinants, which provides a broader definition including both "health and function" and "well-being," as well as a more complete view of the interactions between medical care, the environment, socioeconomic status, genetics, and individual behavior. I believe for policy and management purposes, such an expanded definition and model is required.

How healthy are we?

Even with some general agreement and understanding of what is meant by health, answering the second question, "How healthy are we?" requires precise and useful measures. The most common measure of the health of a population is that of mortality, not only because being dead precludes any concept of health, but also because death rates are one of the most available and accurate health statistics. Overall, mortality rates have been reported for decades, and therefore trends and comparisons over time and with other countries are available. The trends are gradually upward (although not recently for black Americans) and such increases have occurred in the United States and in most developed countries over the last century. This increasing life expectancy is the result both of improvement in general socioeconomic conditions and public health, as well as advances in medical care.

Determining how healthy we are requires a framework that provides an answer in comparison to some standard or benchmark. One comparison can be between different subgroups in the country, such as men and women, race and ethnicity, or different geographic regions of the country.

Table 1 compares age-adjusted mortality across four geographic regions and five population classifications, according to degree of urbanization. The highest rate of 582 is in the Northeast metropolitan core, and the lowest of 429 is in the West metropolitan fringe communities. This is a striking 36 percent variation in this very basic outcome measure. Rates in large metropolitan areas are higher than in rural areas, except for the South where they are about the same, most likely due to the large black rural population. In general, rates are highest in the Northeast, and lowest in the West. The purpose here is not to explain these differences, but to demonstrate the huge variations in this basic health indicator, and to ask whether these variations are ever considered when medical care payment rates are determined or other population health resources allocated.

Another comparative framework is between countries. While it is important to be certain that cross-national data are comparable, death rates among developed countries meet this standard. In 1992,

the United States ranked in 18th place with 79.1 expected years of female life expectancy, while U.S. males ranked 23rd at 72.3 years. Although it is not possible to precisely explain these cross-national differences, American performance clearly invites analysis and attention, since considerably higher levels of life expectancy have been achieved elsewhere. Comparative mortality rates are sometimes criticized as not being "fair," because they contrast nations with substantial differences in their socioeconomic status or higher levels of minority populations associated with poorer health. In the full population health model advocated here, such differences are not considered unfair, but are seen as essential descriptions of the total outcome desired across the entire population.

Quality of life: Morbidity and disability

Mortality data by itself is not an adequate operational definition of health. As Charles Dickens wrote, "It concerns a man more to know the risk of 50 illnesses that may throw him on his back than the possible date of the one death that must come." [5]

Health measures that go beyond death rates are indicators of morbidity or disability. Morbidity is defined as pertaining to disease, while disability refers to incapacity, particularly in the performance of everyday tasks and roles. Measuring morbidity or disability is less precise than measuring mortality and is now only done for samples of the population. Several surveys, such as the National Ambulatory Care Survey and the Health and Nutrition Examination Survey report periodically on the number of medical conditions and diagnoses in the population and compare trends over time.

Initial measures of disability were primarily the number of days in bed and/or days of restricted activity, as well as the number of persons with long-term limitations due to chronic illness. Since 1982, the National Long Term Care Survey has followed disability in terms of limitations in daily living activities, such as eating, bathing, toileting, shopping, housework, and traveling.

Standards or comparison groups for morbidity and disability trends are more limited than for mortality. Most existing measures focus on a particular disease or physical function, although the activity limitation approaches described above go beyond such a narrow focus. A recent report, "Chronic Disability Trends in Elderly United States Populations: 1982-1994," describes the improvement in such measures for America's elderly, and speculates that Medicare expenses may be less than projected in the future if such favorable trends in chronic disease in the elderly continue. [6]

Quality versus outcomes

Over the last several years, more attention has been focused on the issues surrounding health care quality than ever in our history. Ironically, this emphasis has been fostered, in part, through the growth of managed care plans, where information on the quality and outcomes of care for

populations is potentially available.

There have been recent calls for moving to a more performance-based approach to health system quality, most compellingly argued in Paul Ellwood's 1988 Shattuck Lecture on "Outcomes Management: A Technology of Patient Experience." [7] From this work, the Foundation for Accountability (FACCT) has emerged: a new, independent not-for-profit organization founded in 1995 by consumer groups, large private employers, and large government agencies dedicated to "improving the type of information consumers receive to make decisions about their health care." (FACCT, 1997). The Foundation for Accountability is making important contributions to future generations of outcome measurements.

In addition to this effort, Medicare has had a number of quality measurement and research initiatives under way for years, such as its Beneficiary Health Status Registry and a more recent proposal for Beneficiary-Centered Purchasing in the Medicaid managed care program (HCFA, 1996). Shortell and colleagues have recently called for moving to a "community health management system" in which epidemiologic measures of health status are used for performance purchasing. [8]

While these efforts are largely invisible to the public, recent "report cards," largely fueled by the growth in managed care systems and the need for some standard of quality beyond the hospital setting, have been well publicized. The system most widely in use is the Health Plan Employer Data and Information Set (HEDIS), developed by the National Committee for Quality Assurance. [9] Its current version contains more than 60 performance indicators covering quality, access and satisfaction, membership, finance, and management. Although voluntary, more than 80 percent of managed care plans surveyed are reviewing HEDIS for use in whole or in part. In many cases, compliance with these standards is being used in advertising in today's competitive health care marketplace, unlike the individual patient encounter data from fee-for-service practices.

Yet all of this important activity has not settled the issue. A 1997 headline in the Money section of USA Today states "Businesses Leery of Health Care Quality." [10] President Clinton has appointed a national Advisory Commission on Consumer Protection and Quality in the Health Care Industry, to report in early 1998 on quality and results of medical care and standards for consumer protection. Why is all of this necessary? Why aren't we more certain of what health care quality and outcomes are? Why don't all of these efforts give us adequate benchmarks about what our health care expenditures are accomplishing?

One major challenge concerns being able to clarify the relationships between quality and outcomes. In common usage, they are often used interchangeably, but this is not adequate. In Donabedian's early work, he identified three measurable components of quality: structure, process, and

outcome.[11] Outcome refers to the ultimate achievement of the system, such as mortality and life expectancy rates, and going beyond mortality to include measures of morbidity, disability, and quality of life.

The most widely used definition of quality at this time is one issued by a distinguished panel of experts for the Institute of Medicine in 1990. They concluded that "quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge." They stated that under such a definition, health care services are expected "to have a net benefit, with regard to patient satisfaction and well-being, health status and quality of life outcomes, and the process of patient-provider interaction and decision-making."[12]

While the last decade has shown considerable concern and developmental work in outcomes and quality,[13,14] most attention has been at the process- not outcome-level. Furthermore, this effort has focused primarily on individual patients and clinical units like hospitals, not on larger populations or communities. This has been, in part, due to the dominance of "quality improvement" approaches derived from the work by Deming that primarily focus on process improvement.[15]

While structure and process are related to outcomes, this relationship is incomplete enough to be an invalid basis for judging the overall performance of the system and the investments in it, certainly at the community or health plan level. While health professionals and institutions will say, and genuinely mean, that they are concerned about the ultimate health outcomes of their patients, they do not often have adequate data systems available to provide outcomes information, the data that is available may be faulty or misinterpreted, and they are not used to thinking about population health outcomes for the large groups of patients who make up their practices.

Potential measures of population health

The population health concept advocated here proposes using the intermediate health definition of health and function, incorporating the expanded idea of maximizing function in a number of domains. Such a framework requires an operational measure of population health outcome that goes beyond quantity of life (mortality) to add extra dimensions. In other words, the goal is not only to purchase life years, but life years at some level of quality.

The government of Quebec in 1989 stated its primary goals for "Improving Health and Well-Being" as "adding years to life, adding health to life, and adding well-being to life."[16] Healthy People 2000, the health goals for the United States, states an objective of "increasing years of healthy life to at least 65 in 2000."[17]

The challenge of measuring the health status of individuals and populations has been of increasing

concern to researchers and policy makers over the past several decades.[18,19,20,21,22] Deciding on an appropriate operational outcomes measure will be critically important, if population health improvement becomes a policy goal that teachers, researchers, and payment systems might work toward.

In terms of measuring and rewarding improvement in population health, combining individual health status component measures into an overall composite not only requires that many measures be collected and reported, but also some weighting of each one into the composite index. For example how many years of life gained for patients with AIDS is equal to the reduction in depressive symptoms in other patients?

There are significant methodologic issues with aggregating components into a single index or measure, but the advantage of a single aggregate measure or indicator is that it would allow accurate assessment of comparative baselines, as well as improvements across different populations. Having a common measure of benefit is essential when comparing alternative financial investments in a cost benefit framework.

Michael Wolfson from Statistics Canada makes a strong case for such a summary measure, which would be similar to other commonly used indicators, like the Gross Domestic Product and the Consumer Price Index.[23] He states that such a measure would initially be an object of policy interest, would focus attention on population health rather than on health care, and could be gradually incorporated into a financial incentive system.

It is of interest that in 1979 Chen proposed such a single measure called the Gross National Health Product, but it and other suggestions of the time were too mathematically complex for common understanding and use.[24] Recently, it has been suggested that an appropriate aggregate measure of health and function might be "health adjusted life expectancy" (HALE), which combines the length and quality of life into an estimate of the number of years that can be expected in a specified state of health.[25,26]

There have been significant developments in such measures since the Chen proposal. There are several potential approaches for a single measure of health adjusted life expectancy (HALE) that follow the concept of population health presented here, and that could allow the assessment of population morbidity and mortality together; these are Disability Adjusted Life Years, Quality Adjusted Life Years, and Years of Healthy Life.[27,28,29]

Is population health different from the sum of the health of individuals?

Whatever the operational measurement of health and function, what does a population health

framework add to this definition? Why is population health not simply the sum of individual health and function in the total population or sub-population? From a narrow perspective, the sum of the health of individuals is, of course, equal to that of the population under consideration. However, this is too narrow a concept, because it lulls us into thinking that improving health outcomes can be accomplished only by focusing on individual medical care interventions, which is still the dominant model operating today.

A population health framework adds two additional considerations beyond a sum of individual health. The first is a broad understanding of the multiple determinants of health. While this does not change the definition of total population health, it requires a broader perspective than simply providing medical care to the individual.

Most of these non-medical interventions, such as public health, education, and the environment, are introduced at the community or social level, but have a direct or indirect impact on the health of individuals. Examples for thinking about this are reducing harmful contaminants in the air or water, decreasing crime and violence, and public advertising campaigns regarding smoking or sexually transmitted diseases.

The second additional population health consideration is from an economic or resource allocation perspective. If resources were not an issue, then any individual investment in medical care or other health determinant might be appropriate, even if it was very costly, was of questionable effectiveness, or was clearly ineffective, but desired by the individual.

But, given that health care is financed to a considerable degree with public funds, and that employer and individual cash outlays are constrained as well, it is necessary to look at the most cost-effective means of getting value in terms of health outcomes. This may mean that expenditures on some individuals or on alternative determinants of health will have a much higher return than others in terms of the health adjusted life expectancy of the population.

Making such resource allocation decisions is difficult, and has distributional considerations that need to be addressed. However, it is naive to think that such allocation decisions are not being made now, some explicitly (all older persons are provided health insurance and many children are not) and some implicitly (many low-income areas have higher levels of environmental contamination). The population health perspective requires that purchasers, providers, and society consider the health of all individuals, in addition to the health of particular individuals.

This idea is summarized by Evans and Stoddart's statement that "a society that spends so much on health care that it cannot or will not spend adequately on other health enhancing activities may

actually be reducing the health of its population."30 By this, they mean that in a world where resources are limited, spending so much on one health determinant, such as medical care, and leaving less resources to invest in another, like the environment or education--with a possibly greater marginal return to health--may negatively affect the health not only of individuals, but the whole population.

A proposed definition of population health

It is not essential that agreement be reached on the specifics of measuring health outcomes in order to reach consensus on a definitional approach for population health. The generic concept of health adjusted life expectancy (HALE) does seem to fit the criteria for a measure of health and function, combining length and health-related quality of life.

Therefore, a proposed working definition of population health is the health adjusted life expectancy-quantity and quality-of a group of individuals, in an economic framework that balances the relative marginal return from the multiple determinants of health. Whatever the conceptual and methodologic challenges, the price of inertia and doing nothing is to continue to make medical care and other health promoting investments in a framework in which we are not sure of the ultimate outcome we are trying to achieve.

TABLE I U.S.AGE ADJUSTED DEATH RATES

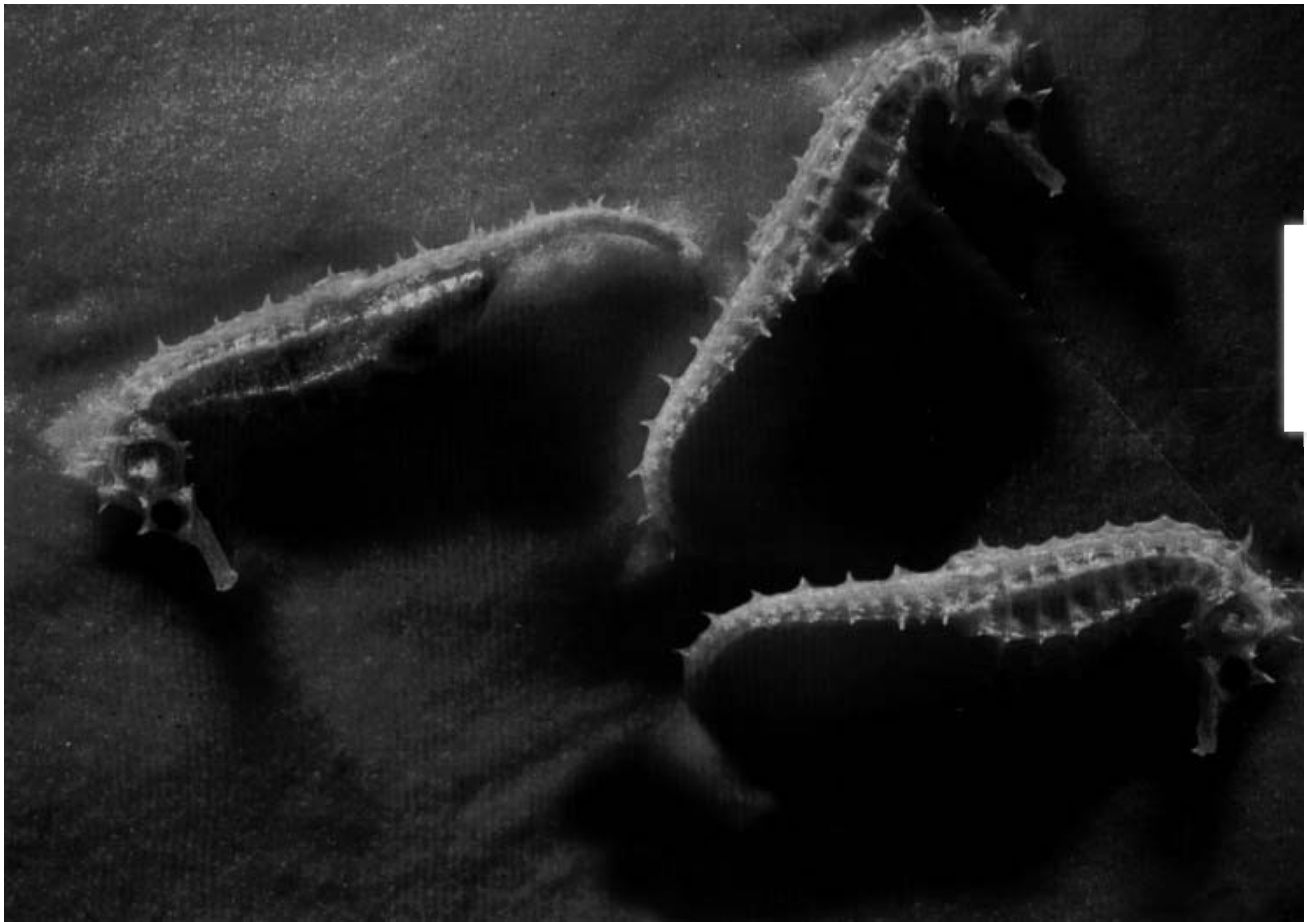
Legend for Chart:

- A - Northeast
- B - South
- C - Midwest
- D - West

	A	B	C	D
Large metro core	582	564	569	491
Large metro fringe	459	467	466	429
Medium/small metro	478	529	483	475
Urban non-metro	483	568	477	485
Rural	482	569	487	471

Source: Data from USDHHS 1995

Note: Death rates are deaths per 100,000 resident population



The population health perspective requires that purchasers, and society consider the health of all individuals, in addition to the health of particular individuals.



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