Health Measurement in the Third Era of Health

When writing about "the second epidemiologic revolution," Terris discussed 2 eras in health. The first era—the communicable disease era—began during ancient times and continues today; the second era—the chronic disease era—began during the 20th century, particularly among the industrialized nations.

Although neither revolution against these types of diseases is complete, we have made such considerable progress that substantial and growing segments of the population no longer regard disease as the only, or even the primary, health problem. Increasingly, the goal is a long and fruitful life, not simply the absence of disease. That potential and the effort to achieve it compose the third era of health, and a proposed new measure of health is outlined in this article. (*Am J Public Health.* 2006;96:17–19. doi:10.2105/AJPH.2004.055970)

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UNTIL RECENT TIMES, health measurement was appropriately focused on disease and injury and their consequences, particularly disability and death, and the activities intended to alleviate disease and injury, particularly medical and related services. However, strictly speaking, those services are not a part of health measurement. During the evolution of mankind, biological susceptibility to disease and injury has been carried forward with the environmental conditions that induce health impairments. Health measurement has increasingly been extended to include these important associations with health.

TWO HEALTH REVOLUTIONS

Terris wrote about 2 eras, or revolutions, in health.[1] The first health revolution was against communicable diseases, and that revolution continues today. The second revolution, which began in the mid-20th century and also continues today, was against chronic diseases. Whereas most health professionals who were concerned with the second revolution focused on institutional care for the affected, epidemiologists began to examine the causative factors of these newly prominent diseases, which they regarded as epidemics that have lasted for decades rather than weeks or months. Their scientific investigations showed how tobacco, excessive fat consumption, lack of exercise, and other factors characteristic of life in industrialized countries during the 20th century caused the chronic disease epidemic.[2,3]

The so-called *epidemiological transition*—from communicable diseases to chronic diseases as the primary public health problem—first occurred among the well-to-do in developed countries, because they were the first to be exposed to the causative conditions. The epidemic of chronic disease then moved down the social hierarchy as the less affluent were exposed to the causative conditions. During the 20th century, coronary heart disease, lung cancer, and other chronic diseases were mass phenomena. However, during the past 50 years, considerable progress has been made against the chronic diseases with the second health revolution, which is well underway in the industrialized world but is only beginning in developing countries. For example, heart disease mortality in the United States has been declining since 1950, and cancer mortality reached a peak in 1990 before it began to decline (Table 1).

THE THIRD ERA OF HEALTH

With the first and second health revolutions so far advanced, what is next? Actually, we have already entered the third era of health,[6] a time when people are living into their 70s and 80s and are increasingly free of disease burdens.

Ninety percent of all Americans, and almost 70% of those older than 75 years, believe their health is excellent or good, not just fair or poor (Table 2). People now seek to develop and maintain their health, not merely combat disease, which reflects the progress against both communicable and chronic diseases. All life activities require a certain anatomical, physiological, sensory, mental, or other health competence—a personal resource. The World Health Organization's (WHO) Ottawa Charter thus defined health as "a resource for everyday life."[7]

In 1948, the WHO said health was a positive notion and that it was "physical, mental, and social well-being, not merely the absence of disease and infirmity."[8] Efforts have been made

TABLE 1—Gross Death Rates per 100 000 From Major Chronic Diseases: United States, 1900–2000

	1900	1950	2000
Heart Disease	137	356	253
Cancer	64	140	197
Cerebrovascular disease	107	104	60

Sources: National Office of Vital Statistics[4] and National Center for Health Statistics.[5]

TABLE 2—Self-Assessed Health Status as Excellent or Good: United States, 1991–2001

	1991	1995	2000	2001
Total, %	89.6	89.4	91.0	90.8
Age, y				
<18, %	97.4	97.4	98.3	98.2
18–44, %	93.9	93.4	94.9	94.6
45–54, %	86.6	86.6	88.1	88.3
55–64, %	79.3	78.6	82.1	80.8
≥65, %	71.0	71.7	73.0	73.4
≥75, %	66.4	67.8	67.8	69.2

Source: National Center for Health Statistics.[5]

to measure health with that WHO concept.[9–13] One such effort noted that health status can be delineated as a spectrum (excellent to very poor) on which every person can be placed at any one time.[13] In that early formulation, however, health was a state of well-being. Going beyond that concept, the Ottawa Charter defined health as a resource for doing things—a capacity, not a state of well-being. According to this definition, health must be clearly differentiated from health status, because health has a dynamic potential for increasing or at least maintaining whatever health status (place on the spectrum) a person has. Health in this sense is a means of moving toward the positive end of the health status spectrum.

Probably more than achieving some degree of health status, people want health as a resource for doing the things they want to do. That view of health characterizes the new era of health. The goal is longevity with good function, and the challenge to health professionals is not only preventing disease and overcoming it when it occurs but also helping people to achieve that goal.

IMPLICATIONS FOR HEALTH MEASUREMENT

What are the implications of this new third era of health and the consequent new definition of health for health measurement? Instead of just describing and analyzing the pattern of mortality, diseases, and disability, health statisticians will have to specify not only the quantitative aspects of health status but also the equal, and perhaps more important, quantitative aspects of health as the capacity for maintaining and improving health because it is a resource for living. Various elements of a person's physical, mental, and social existence make up that resource. Epidemiologists and clinicians will have to consider predictors of both functioning and disease.

As we move into the third era of health, it is useful to briefly look at both ancient and recent beliefs about health. Hippocratic thought in ancient Greece considered health to be an internal equilibrium of the 4 bodily humors: blood, phlegm, black bile, and yellow bile.[14] *Dyskasia*—the disturbance of that internal equilibrium—yielded disease. Because the balance between man and his environment determined the balance of that equilibrium, factors in the environment and ways of responding to those factors profoundly affected health. Similar ideas about health emerged in ancient China.[15]

In 1941, Sigerist said, "Health is not simply the absence of disease: it is something positive, a joyful attitude toward life, and a cheerful acceptance of the responsibilities that life puts upon the individual."[16(p100)] The WHO definition of health further inspired efforts to achieve new kinds of health measurement. Thus, Fanshel proposed 11 categories of health, 1 that encompassed the WHO notion of well-being and 10 others that ranged from dissatisfaction and discomfort through disability and coma to death.[17] In the Human Population Laboratory, actual measurement of health in the WHO sense of physical, mental, and social well-being was conducted with a general population survey.[18–20]

These past endeavors, however, focused on health as a state of positive well-being (physical, mental, and social aspects) or negative well-being (discomfort, disability, coma, etc.). The new concept advanced in the Ottawa Charter—that health is not a state of well-being but a resource for living—can be measured in its physical (e.g., body mass index [BMI]), mental (e.g., cognition), and social health dimensions (e.g., network of friends and relatives). It also can be measured in terms of health-related practices (e.g., exercise), because there is evidence that, as a category of personal characteristics, health-related practices are important resources for living that carry great influence for future health.[21] A schema for systematic health measurement in the third era of health will require some consensus on not only the items to be measured but also the quantitative aspect of each item. For many items, that is well within reach.

Several items in this new kind of health measurement, especially in the physical dimension, are already being widely followed in patient care and health surveys (e.g., blood pressure, BMI, lipid level, and blood sugar). However, we usually call them risk factors and emphasize their levels of becoming abnormal, often to diagnose disease. Thus, blood pressure higher than 140 over 90 is hypertension, BMI higher than 30 is obesity, cholesterol above 200 is hypercholesterolemia, and fasting blood sugar above 126 is diabetes. We must now begin to focus on their optimal ranges, because the goal is not merely to minimize the risks for disease but to seek the maximum potential for living. Now the systematic assembly of all such details is needed for a comprehensive view of health as a resource of living. This should probably be a set of indicators rather than a single index of health.

The interpretation of the data will require establishing consensus on the quantitative range for each item that is regarded to be a part of the resource for health. Such standardization is already accepted for several items as a specification for diagnosis (e.g., blood sugar level for diabetes and hemoglobin level for anemia), but so far these are intended as indicators of a disease state. Clinicians who pursue health for their patients as I advocate here will require specific ranges that indicate an adequate reserve for everyday life. Thus, a fasting blood sugar level of 124

is too close to the diabetic state now specified as greater than 126; a healthful blood sugar range, for example, should possibly be 80 to 100. In the case of bone density, radiographers now designate a certain lack of density as osteoporosis; what I seek, however, is bone strength, not merely the absence of fragility. Therefore, we should ask the radiographers to define and measure the degree of bone density that constitutes the health of that tissue. Some might say that we must take into account age when assessing degrees of health; however, people in their later decades of life do lose some resources for living and thus, have lower health than they possessed in earlier years.

As standard health ranges are set and the relevant surveillance of the population is maintained, public health assessment and policy functions will expand to include setting population objectives for these new health indicators, just as we now set objectives for infant mortality and HIV incidence. The public health assurance function will grow to embrace community-directed activities designed to achieve the objectives for the population as a whole, and physicians will seek healthful ranges of the health indicators for their individual patients. For both public health and medical service purposes, it will be necessary to educate people as a whole about these matters; that is, we need such indicators as guidance for pursuing health—as a capacity of living—not just for avoiding disease states.

Many clinicians are moving toward the kind of health measurement I am suggesting by increasing the range of items incorporated into *comprehensive health examinations* rather than performing the old-fashioned blood pressure cuff, stethoscopic, and manual abdominal *health check-up.* Pediatricians and obstetricians especially have moved out of the limited complaint–response practice framework toward a health maintenance system.

For public health purposes, population health surveys can begin to put together the several items of measurement necessary for each person in a survey and ultimately aggregate the health of the individuals composing the population—in an index—rather than simply determining the proportion of the population who have various blood pressure levels, cholesterol levels, BMIs, and the like. What we need is a comprehensive assembly of the items to provide a view of health as a whole resource for living—for individuals and then for the population—to guide action for health in the future. ■

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