Viewpoints

In response to widespread interest in the development of indexes of health status, a small, multidisciplinary conference of researchers active in that area was held in October 1972 under the auspices of Health Services Research. *The keynote address of the conference, by Monroe Lerner, raised basic philosophical questions that even the most pragmatic of those participating agreed could not be ignored. Dr. Lerner's paper is reprinted here, with two other short contributions on the subject, in the hope of stimulating response from a wider audience. The complete proceedings of the conference are now being prepared for publication.*

Conceptualization of Health and Social Well-being

Attempts to construct an index of health status have at least three major objectives. Perhaps most important of these objectives is to evaluate the effectiveness of current health services delivery systems or programs, especially those of an experimental nature and financed with public funds. Explicitly or implicitly, these systems or programs aim at the maintenance or improvement of the health of some population aggregate. Evaluation thus requires a definition of health in operational terms.

One major problem inherent in the endeavor to define health in operational terms is that health is obviously a multidimensional or "qualitative" characteristic, like intelligence or social class or authoritarianism, as opposed to a unidimensional characteristic like distance, weight, or temperature. Unlike health, these latter characteristics are amenable to observation and can, therefore, be measured directly. Because health is multidimensional, however, it can only be inferred. In addition, its dimensions or components have to be identified and weights assigned to each. To clarify terminology, these dimensions or components are considered as "indicators" to be used in constructing an "index."

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Another problem occurs when the aggregate of population whose health is being measured constitutes a "community," that is, a group bound by ties embodied in social institutions and sharing a common territory in which they live all or most of their lives and through which their fundamental needs are met. However health is defined, the health of a community, I believe, should be considered as more than just the aggregate of the health statuses of the individuals comprising it. To use the terminology of philosophy, it should be considered an "emergent" phenomenon, a whole whose properties cannot be predicted by reference merely to the properties of its parts. The logic of this is that some significant proportion of the well-being of any individual is intimately associated with the health of his community qua community—the community considered as an entity—because men are social animals and achieve their distinctive humanity, well-being, and health only as members of their community. If this statement is to be accepted, as I believe it must be, many difficulties are raised for the measurement process, as well as, incidentally, for the participants in this conference.

A second major objective for constructing an index of health status is to evaluate the quality of health services provided by medical practitioners directly, on a personal basis, to patients. Again, explicitly or implicitly, the goal of these practitioners is the maintenance or improvement of the health of their patients. Although the emphasis here is on an individual patient, rather than on an aggregate or community, index construction is still the difficult problem.

The third major objective for constructing an index of health status is a scientific one: to discover the "true" nature of social reality, independent of any practical application. It is this objective that provides the primary motive for my portion of the present discussion.

The old ways of measuring health appear to be strongly in need of reexamination today, largely because of changing social conditions and because many of the formerly most salient health problems have to a considerable extent been dealt with. In this context, the old ways included the use of mortality rates, particularly infant mortality rates, and of life expectancy, a variant of age-adjusted mortality rates, as indicators of the health of a population aggregate or community. While the shortcomings of mortality rates in whatever form as indicators of health were widely recognized, use of these rates did have at least two virtues: one, mortality statistics were relatively widely available, largely because they were by-products of death registration, a necessary procedure in a well-ordered society, especially a Western industrial society; and two, high mortality rates—that is, large numbers of "premature" deaths—were widely recognized as the most "important" health problem of the day. Why most important? Because it must have occurred to many that those high rates could be reduced, if only because mortality rates were substantially lower in more affluent population groups than in less affluent groups, and lower also in groups where public health measures such as pure water and sanitation had been introduced and were being efficiently carried out. In addition, the prevalence rates for morbidity and impairments by community must have been highly correlated with

mortality rates by community, so that in fact mortality may have been a good indicator of the total spectrum of health, at least as it was defined at that time.

Later, during the twentieth century and especially during the 1930s, as mortality was at first gradually and later rapidly reduced to lower levels, the morbidity and impairment aspects of ill health loomed ever larger. At this time chronic illness, both physical and emotional, became a recognizable entity in its own right. At this time also, it was recognized that the very considerable advances of medicine and surgery in prolonging life often resulted in the creation of large numbers of individuals who, although chronically ill and impaired, nevertheless had many years of life before them. At this point the high correlation of mortality rates with morbidity and impairment rates must have substantially decreased. In addition, and probably simultaneously, "premature" mortality did in fact become a less important problem than previously.

However, the measurement of morbidity and impairment is far more complicated and difficult than the measurement of mortality, largely because death is a unique and clearly defined event, while often morbidity and impairment are not. In addition, the latter conditions have social and emotional as well as biophysical antecedents, in that the rate of disability they engender is filtered through social and emotional determinants and perceptions. Moreover, morbidity, impairment, and disability have several dimensions—duration, intensity, severity, stigmatization, etc.—that complicate the measurement process. Perhaps the most difficult aspect of the measurement process is to combine, in a manner that is not purely arbitrary, mortality, morbidity, and impairment into a single index.

Morbidity and impairment are more than ever recognized today as encompassing a number of sociomedical conditions, i.e., deviant conditions that may be as much social as medical in origin. Some of the more common of these conditions are drug addiction and other forms of drug abuse, alcoholism, and various forms of character and behavior disorder, e.g., sexual pathology. In this sense both morbidity and impairment may be thought of as part of the "quality of life," as distinct from its quantity. Quality of life, an elusive concept, is evidently unmeasurable, perhaps even undefinable. An even greater complication is that sociomedical conditions encompassing deviant behavior often involve a moral or ethical dimension; that is, we are not sure whether to designate people who are afflicted with these conditions as ill, or as immoral rather than ill. Morbidity and impairment are thus seen as including the dimension of social role performance and conformity to social norms, as well as to moral and even ethical standards.

The World Health Organization some years ago took what in retrospect appears to be a giant step in what I, at least, define as the right direction when it defined health as not merely the absence of disease but rather a state of complete physical, mental, and social well-being. While the moral dimension is not mentioned here, since it was probably intended to be included under the phrase "social well-being," this definition has the merit of at least pointing to the arti-

ficiality of the distinctions among the physical, mental (or emotional), and social dimensions of health.

In an earlier day, before the extensive specialization of occupations and the corresponding division of labor, the medicine men or the witch doctors of preliterate communities treated the "whole man" for all his ailments, whether physical, emotional, social, moral, or some combination of all these. Subsequently, as society developed its helping professions, men were, at least for the purposes of receiving assistance, fragmented, split into separate components of being, in a manner that was perhaps very unreal, since a human being remained a whole human being despite the fragmentation of the helping professions. Today, at a time of great looseness of societal structure and in the face of breakdowns in many forms of social control, so that sociomedical conditions are perhaps more prominent than ever before, we must define health in these earlier terms, even taking the WHO definition several steps further. This should be done despite the obvious difficulty in operationalizing WHO's concept and in constructing an index of health that will combine physical, mental, and social well-being in some "valid" manner. How can we assign weights to these components that are not purely arbitrary? These weights should have some theoretical relevance or underpinning, so that they are valid. To do this, I suggest the following approach.

A fundamental assumption is that man as a species consists of individual men who live in groups of various kinds and sizes. These groups are crucial in various degrees to the existence of men, but the starting point must be man as an individual. Man as an individual is a biological organism characterized by life and therefore having a beginning, stages of growth and development, maturation, senescence, and an end. The sheer duration or quantity of life can readily and easily be measured along the dimension of time. But according to the WHO definition, health should be defined in terms of the quality of life in addition to its quantity, and the two cannot be readily and easily combined into an index. This is precisely the point on which all index construction to date has foundered.

Even though the quantity of life can readily be measured on a unidimensional continuum, along an axis of time, and therefore objectively each unit has the same weight, human beings *subjectively* attribute different weights to various points along that continuum; that is, life at different ages or at its various stages appears to have different "meanings" to people, and therefore different values or weights. Further, that meaning, value, or weight varies according to cultural factors and value systems and is therefore socially defined. From this perspective even time, as a dimension along which duration of life is measured, is not as unidimensional as it initially appeared. Perhaps it is best treated as a qualitative concept. One implication of this statement is that probably no single index of health will be applicable at all times and places or even for different segments of the population in the same society, because old age, for example, is valued more highly relative to youth in some settings than in others.

The health status of an individual, at any given moment of life, is usually

measured by indicators of morbidity, impairment, and disability. However, it should also contain an indicator expressed in prognostic terms, i.e., in terms of expected survivorship. This indicator should be based on "vitality," the expected years of life remaining to an individual at his current stage of health. This seems to be something along the lines of an actuarial life table for impaired lives, where survivorship is the focus. Prognostication for this purpose, expressed on a scale of vitality, should perhaps be thought of as a proxy indicator of health status rather than as an actual component of an index.

Even if we consider the quantity of life as unidimensional—that is, in objective rather than subjective terms—can we assume that quantity of life is highly correlated with the various components, however we define them, of the quality of life? This is a matter for empirical investigation, and it leads us to the question, how should we define or measure the quality of life? Quality of life and freedom from disability are not synonymous, except in the grossest terms. That is, disability, or freedom from it, measures merely the performance of major social roles in dichotomous terms. The subjective aspect of the performance of roles, their meaning or satisfaction to the individual, and the manner in which they are performed are omitted.

Perhaps this concept, quality of life, can be understood in the following terms: the individual is a biological, social, moral, and emotional being. Thus health must be considered as having at least these four components, which are all related in one way or another to functioning and for which life is the precondition. The assumption must be made that, for the individual, any life is healthier than no life at all. Thus an individual is healthier without a limb or with impaired vision, or even living without consciousness or as a "vegetable" or in terminal illness, so long as he is alive, than he would be if he were dead. These states are qualitatively different. The same principle holds for a group or population aggregate; that is, anything or anybody or any institution that threatens survivorship is *ipso facto* unhealthy. Perhaps the measurement of quality of life can be approached from the point of view that the quality of life is high when the individual functions at a high level: when he is free of morbidity, impairment, or disability and when his vitality is high; when he fulfills his major social role obligations satisfactorily according to his own values and those of his group; when he has a high moral self-evaluation and evaluation by his group; finally, when he is emotionally healthy.

Can we have healthy individuals in a sick society, or vice versa? Yes, I think. A society has its own needs for survivorship, that is, for the continuation of its function; thus its health can be defined in those terms. As regards the individual, a sick society would impinge on the health of the individuals comprising it when it provides little in the way of public health, preventive measures, or facilities for personal health; when it sets up expectations for the performance of major social roles that are impossible of attainment; when the average score of its population is low on a scale of socially defined moral approval (again, perhaps because the standards are impossible to achieve); and when the average level of emotional health is low.

The cultural relativism implied by socially defined moral approval cannot be total, for tensions and strains that could interfere with the adequate functioning of individuals in the society would thus be created. From this point of view, a "tight" society with a rigid social structure is healthiest for the aggregate of individuals comprising it, but a loosely structured society might be best for some individuals. In these terms there appears to be almost a contradiction between individual health and the health of the group.

One implication of these statements is that societies, like individuals, may have a hierarchy of needs along the lines elucidated by Maslow, and that these needs may be different at various stages of social and technological development. For societies at low levels of development—hunting and gathering societies, pastoral societies, etc.—the most important needs are those of sheer survival; later this becomes less important, paralleling the situation in which mere subsistence, since it represents a problem that is essentially solved, becomes less important to the individual. To take this a step further, this means that, although we can perhaps devise an index of health that will have universal applicability to all societies at any stage of development, in the sense that for each of these it will contain the same components, the relative weights accorded to each component must vary with the problems facing that society at a given moment in its historical development and with the extent to which any society anywhere has ever met those challenges. The same reasoning is applicable to the individual within society with regard to an index of health status. The components must be the same for everyone, but the weights assigned to a component might vary according to the problems facing that individual and the best that any individual in similar circumstances has done in solving those problems.

Along these lines, it appears to be appropriate to modify the proposed use in an index of the expectation of disability-free years of life. The expectation of disability-free years of life should be summed for each age to reach a total for all ages; but different weights should be assigned for each age. For example, the weights might be highest under age 50 for females, perhaps under 65 for males, and they should taper off at the older ages. Alternatively, a prognosis could be made of expected disability-free survivorship of a given individual at the moment of observation on the basis of his general state of health, perhaps as judged by a physician, and on the basis of the presence or absence of illness or impairment at various levels of severity and of the probability of his being afflicted by a specific illness during his lifetime because of his life-style. Each individual would be scored along the lines suggested by the population aggregate; for example, it would be most important to survive disability-free to the ages specified above and less important thereafter. But this derived score for the individual would be modified by relating it to the best scores attained by anyone in his age and sex group.

The second component in the index would be social adjustment relative to disability-free years of life. I suggest that sheer physical health—that is, disability-free years—may be more important to overall health in the years prior to adulthood, while social adjustment may be more important to overall

health in adulthood and through to the end of the childbearing years. Physical health may once again be more important later on.

In this context, physical and emotional impairments set limits to what can be expected of an individual. We have a problem with impairment, because the social definition of appropriate behavior for impairment has changed, so that in fact, for many impairments—blindness, for example—ideologies and patterns of expectation have emerged that urge and even require maximum independence and social participation. How does one define the health status of the blind person whose adjustment to his condition and social-role functioning are at optimal levels? Should a blind person be considered less healthy than a sighted person? In terms of the physical health component of the index, yes; because the individual does have a physical handicap and may have some disability, even if minor, resulting from it, and his life expectancy, especially his expectancy of disability-free years, may be substantially less. In terms of the social adjustment component of the index, however, it is primarily subjective considerations that determine whether an individual with an impairment such as blindness should be considered less healthy than others.

In summary, we mustn't look on health in the narrow terms that we have been accustomed to and that many of the papers for this conference do. Health is more than just a biomedical phenomenon; it involves a social human being functioning in a social environment with social roles he must fulfill. In addition to that, I think we have to consider the social human being as also a moral being, and this has obvious ties to his conception of himself and his society's conception of him as an emotionally healthy person. I think we have to construct an index that includes all these components.

—Monroe Lerner

Health Index and Utility Models: Some Thorny Issues

The utility model for the evaluation of health care programs may be considered an extension and generalization of the cost-effectiveness approach. The original concept for this model was developed simultaneously and independently by two groups at two locations: Bush's group, formerly in New York, now in San Diego [1–3]; and our group at Hamilton and Buffalo [4,5]. Central to this model is a health index that assigns a value of 1 to good health, 0 to death, and a value between 0 and 1 to all possible intermediate health states.

Extract from a paper presented at the 41st National Meeting of the Operations Research Society of America, New Orleans, April 1972.

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