AN APPROACH TO CONCEPTUALIZING THE LEVEL OF COMMUNITY HEALTH

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I-Introduction

Apparently by common consent, the "old" ways of measuring health appear to be strongly in need of re-examination today, largely because of changing social conditions and because many of the formerly most "salient" health problems have to some considerable extent been dealt with. In this context the "old" ways included the use of mortality rates and a variant of these rates, life expectancy, and more particularly infant mortality rates, as indicators of the total health of some sort of a population aggregate, e.g., a "community".

While the shortcomings of mortality rates in whatever form as indicators of health were widely recognized, use of these indicators did have at least two virtues: 1. Mortality statistics were relatively readily and widely available, largely because they were collected as a by-product of death registration, a necessary procedure in a well-ordered society, especially a Western industrial society; and 2. In fact "high" mortality rates, i.e., large numbers of "premature" deaths, were widely recognized as the "most important" health problems of the day, in the sense that it may have appeared to many that these high rates could be reduced, if only because mortality rates were substantially lower in more affluent population groups and/or in groups where public health measures, as symbolized by pure water and sanitation, had been introduced and were being efficiently carried out. In addition, morbidity and impairments must have been highly correlated with mortality, so that in fact mortality may have been a good indicator of the total spectrum of health as it was defined at that time.

Later, during the second third of the 20th Century and as mortality was at first gradually and later rapidly reduced to levels even substantially lower than those prevailing at the beginning of the century, the morbidity and impairment components of health began to come to the fore. This was the time when chronic illness became a recognizable entity in its own right and when it was recognized that advances of medicine and surgery in prolonging life often resulted in the creation of large numbers of chronically ill and impaired individuals who had many years of life before them. At this point the correlation of mortality rates with morbidity and impairment rates was probably substantially lowered and, in addition and perhaps simultaneously, premature mortality did in fact become a less important problem than it previously had been.

However, measurement of morbidity and impairment is far more complicated and difficult than the measurement of mortality, largely because death is a unique, clearly-defined event while often the former is not. Also, morbidity and impairment often have social and emotional, as well as bio-physical, antecedents, and this adds an element of complexity to the measurement process. Morbidity and impairment have several dimensions--e.g., duration, intensity, the severity of the resulting disability, etc.--which complicate the measurement process no end. In addition, the most difficult problem is to devise means of combining mortality with morbidity and impairment into a single index, and to do this in a manner which is other than purely arbitrary.

If these problems were not enough, further and more complicated problems have developed today, and to find the solutions to these problems is very much on the present agenda. Thus morbidity and impairment are today more than ever recognized as encompassing a number of "socio-medical" conditions, i.e., conditions which may be as much "social" as "medical" pathologies, often including some elements of both in some kind of a mix, e.g., drug addiction and other forms of drug abuse, alcoholism, sexual pathology, etc. In this sense both morbidity and impairment may be thought of as part of that elusive concept, the "quality of life", a condition which is evidently unmeasurable and perhaps even undefinable. An even greater complication which appears in this context is that "socio-medical" conditions often involve a moral dimension, i.e., we are not sure whether to designate people who are afflicted with these conditions as ill or as merely immoral rather than ill.

The World Health Organization some years ago took what, in retrospect, appears to be a "giant step" in the right direction when it defined health as not merely the absence of disease, but rather as a state of complete physical, mental, and social well-being. While the moral dimension is not mentioned here, this definition has the merit of at least pointing to the artificiality of the distinctions among the physical, mental, and social dimensions of health. Thus we come full circle. In an earlier day, before extensive specialization of occupations and the corresponding division of labor, the "medicine man" or "witch doctor" of preliterate communities treated the "whole man" for all of his ailments, whether physical, emotional, social, moral, or some combination of all of these. Subsequently, as society developed its "helping professions", men were, at least for purposes of treatment, fragmented, split into separate components of being in perhaps a very unreal manner, since the human being remained a whole human being. Today, at a time of great looseness in societal structure, and in the face of breakdown in many formerly potent social controls, we must define health in these earlier terms, even taking the WHO definition several steps further. This should be done despite the very obvious difficulties in operation-

alizing these concepts and devising an "index" of health, one which will consist of all of these components combined into some sort of a valid mixture.

II-Some Theoretical Considerations and Issues in the Development of a Definition

The approach taken here is this: Health must be thought of as a qualitative, multi-dimensional characteristic, one which must be inferred since it cannot be observed or measured directly. The problem, which both manifests itself and must be solved at several levels, is: What are the components of this multi-dimensional characteristic, and how many levels do these components have? Given the fact that there are several levels (a statement to be explained shortly), how can the components at each of these levels be treated as indicators and put together into a mix, or index, i.e., how to assign weights, which are not purely arbitrary, among the components at the various levels? These weights should have some theoretical relevance, or underpinning, yet permit the index which is to be developed to be operational in character.

The first level (either of analysis or health) is this: Man as a species consists of men as individuals who, although individuals, nevertheless live in groups of various kinds and sizes, and these groups are crucial, in various degree, to the existence of man. Thus the starting point is, or must be, man as an individual. Man as an individual is a biological organism, characterized by life and therefore having a beginning and an end. The sheer duration or quantity of life can readily and easily be counted along the dimension of time; this poses no really formidable conceptual problem. However, this uni-dimensional characteristic, the quantity or duration of life, must be thought of as a pre-condition for health rather than as a component of it; considering man as an individual, biological organism, it is a necessary although not a sufficient condition for health. The approach taken here, following the WHO definition, is that health should be defined in terms of the quality and quantity of life, rather than merely in terms of its quantity. Further, the quantity of life cannot be readily and easily combined into an index of health with various components of the quality of life. This is precisely the point at which all index construction, at least up until now, has foundered.

Before turning to this, however, several points should be made:

1. Even though the quantity of life can readily be measured on a uni-dimensional continuum along an axis of time, and therefore objectively each unit has the same weight (as is the case on an interval scale), subjectively human beings attribute different weights to various points along that continuum, i.e., life at different ages or at its various stages appears to have a different "meaning", and therefore a different value or "weight"; further, that meaning, value, or weight varies according to cultural factors and value-systems, and probably, therefore should be considered as "socially" defined. We informally weight it differently in different historical settings and times. Thus even time as the dimension along which duration of life is measured is not as uni-dimensional as it initially appeared to be. Perhaps it is best treated as a qualitative rather than as a quantitative variable. One implication of accepting this statement is that no single index of health will be applicable at all times and places, or even for different segments of a population in the same society.

2. We may be able to avoid this difficulty, at least when considering the health of groups or population aggregates of various sorts, by assuming that on a statistical basis, i.e., where comparisons of populations are involved, mortality rates at various ages will be highly correlated with one another and with overall (age-adjusted) mortality rates and/or life expectancy. A possible exception to this assumption may be the "saving" of "high-risk" or "impaired" lives during infancy and the younger years, a widespread consequence of improved modern medical technology, with a resulting carrying over of these lives to the middle years, where even modern medicine can no longer (as yet) assure their survivorship. The strength of the overall correlation is a matter which could be determined by empirical research.

3. The "health status" of an individual at any given moment of life should also presumably be measured by an "index" of some sort. However, for an individual this index should clearly not contain a mortality component, except perhaps a prognostication, e.g., at his present stage of vitality (or health?), how many years of life can this individual expect, or how many is he likely to have remaining to him? This seems to be something along actuarial lines of a life table for "impaired" lives. A prognostication of this type should perhaps be thought of as a "proxy" indicator of health status, or of some index of health status, rather than as the actual component of an index.

4. Even if we consider the quantity of life in simple, objective terms as uni-dimensional, can we assume it to be highly correlated with the various components of the quality of life (however we define those)? This also is a matter for empirical investigation.

How deal with, i.e., define and measure, the quality of life? Even the concept of "disability-free days" doesn't do this adequately, except at the grossest level. That is, it addresses merely the performance of major social roles in dichotomous terms--yes or no. (Even here, as Parsons and Sullivan say, we have no adequate delineation of roles for the aged.) The subjective aspect of the performance of roles--their meaning and/or satisfaction to the individual and the manner in which they are performed--is omitted.

Perhaps this concept--quality of life--can be understood in the following terms: The individual is a biological, social, moral, and "emotional" being. (The WHO definition which had included "social well-being" as part of health had in fact begun to approach this idea, but it was never operationalized.) Thus health must be considered as having at least these four components, all related to functioning, and for which life is a pre-condition. 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, so long as he is alive, than he would be if he were dead. The same principle holds for a group or population aggregate, i.e., anything or anybody or any institution that threatens its survivorship is ipso facto unhealthy.

Perhaps the measurement of "quality of life" can be approached from this point of view. The quality of life is high where an individual "functions" at a high level--where he lives and is free of organic impairment or illness, or at least disability due to organic impairment or illness; where he lives and fulfills his major social role obligations satisfactorily according to his own values and those of his group (the potential contradiction between these two is worth extended discussion); where he lives and has a high moral self-evaluation and also receives a high moral evaluation by his group (again the potential contradiction is worth extended discussion); and finally, where he lives and is emotionally healthy.

Can we have healthy individuals in a sick society? Or vice-versa? Yes, I think. However health is defined, the health of a group or population aggregate (society, community, etc.) must be considered as an emergent phenomenon, more than simply the health of the individuals comprising the group or aggregate. The group or aggregate has its own "needs" for suvivorship, i.e., for the continuation of its functioning, so that its health can be defined in these 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 which are impossible of fulfillment; when the average score of its population is low on a scale of socially defined moral approval, again perhaps because the standards are impossible of attainment; and when the average level of "emotional" health is low. Tensions and strains which at the extreme interfere with the adequate functioning of individuals in the society would thus be created.

Ideally a "tight" society, with a "rigid" social structure, is healthiest for the aggregate of individuals comprising it. However, a loosely structured society might be best for some individuals. In these terms there appears to be almost a contradiction between an individual's health and the health of the group.

Essentially a "model" is implicit in these statements, something along these lines: A "healthy" society (in another context, a "good" society) is one which permits the average individual--once he enters the state of life--to do the following:

1. Live a relatively "long" life. How long is long? Perhaps "long" is the best that can be, or has been, done for any large population aggregate, anywhere, in the state of the arts current at the moment of measurement. Clearly, a standard is implied, and it must be a changing standard as the state of the arts improves. This implies an upper limit, at least for this component of an index. It assumes that there are individual differences among men, that even in the "ideal" society, where social conditions are "perfect", length of life will vary among men due to individual differences in innate biological or genetic endowment. Also, subjective elements related to the socially defined value of life at different stages of the life cycle have to be included here.

2. Live a life relatively free of disability (as expressed in behavior rather than in subjective "feeling states") due to "illness" or physical or organic "impairment". Clearly a standard is implied here also, i.e., the best that can be, or has been, done for any large population aggregate, anywhere, in the state of the arts current at the moment of measurement. Here too individual differences and subjective evaluations of the social importance of freedom from disability at various stages of the life cycle are relevant also.

How can we combine these components into an index, i.e., what weight can we give to each? Very arbitrarily, a healthy society is one in which, at an absolute minimum, the number of individuals who are born, achieve maturity, and reproduce is sufficient to preserve the continuity of the most essential cultural components of the society from generation to generation. So by this definition alone, a definition which emphasizes societal continuity, what happens to people during their childhood and reproductive years, i.e., whether they survive sufficiently long to reproduce, is more important than what happens at other stages of their life cycles. However, one problem here is that while the upper limit to the reproductive period can be fixed for females at least within a relatively narrow age-range, this is not true at all, or perhaps not as true (i.e., there may also be a range, but it may be much wider) for males. Another problem is that, at least in industrial and post-industrial society, with its relatively high degree of control over mortality, survivorship through the reproductive period is no longer the major problem it once may have been. The pendulum has swung all the way over to the other side, and the shoe is now on the other foot. At this moment it looks as though there may be another swing of the pendulum, although perhaps of another kind, if fertility declines to below replacement levels.

These comments should not be understood as implying that zero or negative weight should be given in the construction of an index to the components of the index represented by survivorship and freedom from disability during the non-reproductive years. However, they do imply that less weight should be given to survivorship and freedom from disability during these stages of life than during the reproductive years.

3. Live a life in which each individual's major social role obligations are performed "satisfactorily" according to the values of that individual and the consensus of values of the "groups" to which he relates. Here the word "group" must be considered at many levels. For example, it may be considered as one's own immediate reference group--perhaps coincidental, or congruent, with one's primary groups, as the term was used by Cooley, one's family (either of orientation or procreation or both, either im-

mediate or extended), one's peers, etc.; it may be considered as some combination of the vast number of "secondary" groups, again in Cooley's sense, which impinge on each individual; or it may be considered as the larger community, however defined, or society, of which one is a member. The individual receives social reinforcement or reward from all of these groups, although at varying levels of intensity, and the outcome of this process has a varying degree of salience or importance to him; as a consequence, however, they are all of some importance to him in terms of his self-evaluation (an important element in Jahoda's first criterion of emotional health, self-perception).

What if the individual disagrees with the group, e.g., about the roles that he should play or the way in which he should play these roles, his life style, etc.? Is there room for the completely autonomous individual (in the sense of Riesman, Maslow, etc.) in society? Or, should we consider only the "adjusted" person (in Riesman's sense, adjusted to the social character type predominant in the society in which he lives), as healthy? More important for present purposes, is the autonomous individual healthy or unhealthy? My own bias along these lines is that the healthiest situation occurs when there is some disagreement or contradiction between the individual and his groups, and when as a consequence there is a level of tension along these lines sufficient to stimulate in the individual what Jahoda calls "positive mental health", i.e., some kind of a "creative" existence which in the end improves rather than detracts from the total level of the group, however that may be defined. However, this means that the disagreement cannot be too great, i.e., the disagreements cannot involve too many individuals, so that the essential functions of the group are not threatened. This returns us to our model, mentioned earlier, of the "healthy" society which, at an absolute minimum, produces a situation sufficient to preserve the continuity of the most essential cultural components of the society from generation to generation.

One implication of the preceding statements is that societies, like individuals, may have a hierarchy of "needs" along the lines elucidated by Maslow and which require satisfaction, and that these needs may be different at various stages of societal and technological development. For societies at low levels of technological development --hunting and gathering, pastoral, etc.--the most important requirements or needs are those of sheer survival, as indicated earlier; later this becomes less important, paralleling the situation in which mere subsistence, since it represents a problem 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 which will have universal applicability to all societies at all stages of historical development, everywhere, in the sense that for each of these it will contain the same set of components, the relative weights accorded to each component must vary in accordance with the "problems" or "challenges" (in Toynbee's terms) facing that society at a given "moment" (a historical era, or epoch) in time and the extent to which any society has ever solved these problems or met these challenges. The same reasoning is applicable to an individual, in society, with regard to constructing an index of health status. The components must be the same for everyone, but the weights given to each component must vary according to the problems facing that individual and the best that any individual, in similar circumstances, has done in solving those problems. The same reasoning is also applicable to the construction of an index of health levels for population aggregates of various types. Again, the components must be identical, but the weights accorded these components must vary in accordance with the nature of the challenge to the aggregate and the "best" responses that have been made.

Now the problem of combination of components into an index is once again far more complicated than it was when this problem was confronted in the earlier phase or our discussion. We now have to suggest ways in which to combine survivorship and freedom from disability, considered as individual components of an index of health, with still another component, satisfactory role performance. To reiterate, the society requires at least a minimum level of satisfactory role performance, while for each individual, role performance which is satisfactory in both the individual's and his various groups' terms presumably results (or there is at least a correlation) in a satisfactory self-evaluation on the part of the individual. What numeric weights can we give to each component?

Here is what I suggest that we do, at least thus far: From the point of view of constructing an index of health levels for an aggregate, we start with the concept "expectation of disability-free years of life" or "disability-free survivorship" along the lines of suggestions made by Sanders and Sullivan. However, we have to modify this in several ways:

1. The expectation of years of disability-free survivorship at each age has to be summed for all ages, however with different weights to be given to the figures at each age. For example, the weights would be highest under 50 for females, perhaps under 65 for males, with the weights tapering off at older ages. The figure to be included in an index of health status of an individual could also be approached from this point of view: A prognosis could be made for the expected disability-free survivorship of a single individual at a given moment, based on his general state of physical health, perhaps as judged by a physician and based on the presence or absence of illness or impairment of various kinds and at various levels of severity, and the negative probability of being afflicted with any of these on the basis of one's life style. Each individual should be scored differentially, along the lines suggested above for population aggregates (it is most important to survive disability-free up to the ages specified above and less important thereafter, etc.), but this derived score for an individual would be modified by relating it to the best scores obtained by anyone in his age-and-sex group, etc.

2. Role performance can be judged behaviorally at the simplest and grossest level merely in terms of whether the individual is actually performing the major social roles expected of him and "appropriate" according to "social" definition,

i.e., deemed appropriate by both the individual and his various groups. These major social roles, I believe (clearly, this is my own bias) are of two general types, perhaps for the moment at least to be weighted equally in the construction of a sub-index--occupational and familial. However, here too some ambiguity arises. For example, what is the appropriate occupational role for a retired person? How do we classify unmarried adults, married couples without children, etc.? In some way people have to be classified in terms of their "social adjustment" as expressed in the performance of major social roles, and scores computed, so that these scores can be put into an index.

Having said this, the next question is, "How important is this social adjustment relative to disability-free years of life?" The answer to this question will determine the relative weights to be accorded to each of these components of an index of health. Again, sheer physical health (disability-free years) may be more important to one's overall or general health in the years prior to adulthood, while "social adjustment" may be more important to one's overall health during the adult years and through to the end of the child-bearing period, and once again physical health (disability-free years) may be more important later.

Physical and/or emotional impairment deserves mention in this context; these types of impairment set limits on what can be expected of an individual. For example, a blind person surely cannot be expected to perform a job for which sight is a requirement; nevertheless, there are other jobs which he can perform and which do not require sight. Should a blind person be considered less healthy than a sighted person?

In terms of the physical health component of an index, "yes" is the correct answer because the individual does have a physical handicap; he may have some disability, even if minor, resulting from it, and his sheer life expectancy, especially his expectancy of disability-free years, may in fact be substantially less (the latter because of accidental deaths, etc., the former because he may require relatively specialized care as he becomes older, etc.).

In terms of the "social adjustment" component of an index, however, it is primarily the subjective considerations which determine whether an individual with an impairment, e.g., a physical handicap such as blindness, should be considered less healthy than others. The question is, "How do the impaired individual himself and society in general, including the primary and secondary groups significant to him, define his impairment?" What expectations should he live up to? The social adjustment of the impaired person must be deemed satisfactory if he indeed lives up to the expectations for him. The expectations themselves are likely to be a blend of what is possible and what is desirable. If the impaired person can carry on an occupation and/or hold a job (even in a "sheltered workshop" type of situation), this is all to the good and his social adjustment must be rated as high. Similarly, if the impaired individual can carry on normal family relationships, the same must be said, i.e., his rating must be high.

A distinction must be made here between impairments which have no presumed "voluntary" component in them and those which have. This attribute of impairments must be seen as a continuum, with an infinite number of gradations along the line. Some impairments are essentially self-inflicted, i.e., they occur because the individual engaged in behavior with a high probability of becoming impaired as a consequence, while others may be thought of as purely accidental. Much less stigma attaches to the latter, and individuals in this category are much more likely to make a proper "social adjustment" to their impairment and to be defined as "healthy" in spite of their impairment.

At the societal level, societies with large proportions of impaired individuals--impaired in the former sense, with a large component of presumed voluntariness involved--should be rated as less healthy societies. This is particularly true of societies with large numbers of alcoholics, drug abusers of various kinds, sexual deviants, psychopaths, etc. But societies as the unit of measurement should also be rated as healthy or less healthy in terms of the amount of family disorganization, crime, and unemployment which characterize them.

4. Live a life in which each individual has a high moral self-evaluation but also receives a high moral evaluation from his group. This ties in very closely with the preceding discussion. Individuals who meet their major social role obligations are likely to receive a high moral evaluation, both from themselves and from their groups. They are likely to be considered worthy persons and their self-concepts are likely to be good (in Jahoda's terms).

In Western society, at least, a negative moral evaluation is likely to result from "copping out", i.e., abdication of moral responsibility for work and satisfactory family relationships, and particularly when these occur in the absence of an "achievement-orientation" on the part of the individual, i.e., an orientation to control and transform nature and the environment to suit man's ends. Conformity to Riesman's inner-directed social character type remains the moral ideal. Although some changes may be occurring in this ideal, it does not appear that basic concepts have been in any way altered. The alienated commune-oriented individuals constitute but a small minority, an unimportant segment of the total.

Elsewhere, however, i.e., in other civilizations, values differ. Thus in societies where Hindu and/or Buddhist values predominate (e.g., India, S.E. Asia, and elsewhere), an "escapist" orientation is perceived much less negatively than is the case in Western societies. Moral approval is often conferred upon individuals who retire from the "active" life to a life of meditation and contemplation. But whatever the activities or life styles which result in moral approval is everywhere required as an essential component of health.

Here also an important methodological question is, "How important is moral approval relative to social adjustment and disability-free years of life?" The answer to this question, again, will determine the relative weights to be accorded to

each of these components of an index of health. However, moral approval unlike social adjustment does not appear to have an age-referent; it probably is equally important at all ages and stages of life.

In any community, disability-free years of life can be aggregated for all individuals comprising the community and divided by the number of individuals, and an average number of disability-free years per individual in the community thus obtained. Communities can be compared on the basis of these averages. The same may not be true, however, for social adjustment and moral approval, except as indicated below. Both social adjustment and moral approval are essentially socially conferred attributes, and probably their distribution in any community is described by a normal curve. That is, some individuals in any community will be very well-adjusted, some will be socially deviant, and probably most will fall somewhere in the middle. Probably the mean scores will be similar for most societies within the industrial society category and similar also among traditional societies which are culturally similar and similar in terms of their major value-orientations. The same situation probably characterizes moral approval. The implications of these statements for the measurement of health levels and the construction of an index of health merit further exploration and discussion.

III-The Health of Individuals Versus the Health of Groups or Aggregates

However health may be defined, a major theoretical issue which does not appear to have been treated adequately in the literature is whether health should be defined differently for individuals than for groups. In practice the concept of health status is used to refer to the health of individuals, while the concept of health level is used to refer to the health of a group, a community, or some sort of a population aggregate.

Another way of asking this question is to ask whether, once health has been defined, the measurement process should be that the sum total of the health statuses of all individuals in the group should be simply cumulated and averaged to derive a measure of the health of the group as a whole, or is the health of the group an emergent phenomenon, over and above the health of all the individuals comprising it, and therefore to be measured in some other fashion? Some logic arguing that there may actually be different definitions for the health of individuals and for the health of groups stems from the differing "functional requirements" of individuals versus those of groups. (Groups in the present usage may be societies, families, communities, etc.) "Functional requirements" should be understood here as the requirements for survival of the individual as a system--biological or otherwise--and clearly the requirements for survival of a group qua group, i.e., as a system--cultural or otherwise.

Three definitions of health, and therefore three levels of analysis, appear to be involved here. One of these relates to the individual and his functional needs for survival as a biological organism. He needs food, clothing, shelter, and perhaps many other goods and services. But Maslow's conceptualization of a hierarchy of needs among individuals is relevant here, and at the simplest level an individual may require only the most necessary ingredient for survival, i.e., food. The health of a group, in the second level of analysis, may be thought of as simply the sum total of the health of all the individuals comprising that group. Here the group or community is considered as an aggregate, no more or less, and without emergent properties.

But there is also a third meaning to the notion of health, especially with reference to the health of a group. This has to do with its sheer survival. In other words, for survival the group itself must be considered as having certain functional needs qua group. This is important because all individual human beings are members of groups. They derive their distinctive humanity from group membership. Therefore it is incumbent on the group to survive if human beings are to remain human.

From this point of view it may be argued that, since human societies and communities are comprised of human populations, their survival depends at least in part upon the provision of an adequate physiological relationship to the setting in which they exist, including a considerable degree of control over fertility and at least a minimum degree of control over mortality. Related to these, human society also depends for survival upon such essential functions as socialization, language and communication, economic production, the preservation of order, maintenance of motivation, and the establishment and maintenance of integrated values. Thus, fertility and mortality are sociological phenomena interrelated with other essential features of human societies. Population is an endogenous variable in the analysis of social systems. Each society has structural patterns with consequences for fertility and mortality, i.e., its structures have to be suitable for survival in demographic terms.

Not surprisingly, therefore, preservation of life is a universal value in all human societies, except under those circumstances in which the taking of one's life, or perhaps of a small number of lives, rather than decreasing the society's chances for survival reaffirms the values of the group and stresses its solidarity, or in some other way improves its chances for survival in the face of a hostile environment. All societies institutionalize patterns of behavior intended to preserve health, or to restore and maintain it, and to prevent death. Often these patterns of behavior may actually be inefficient and inconsequential in achieving this end; probably, prior to the modern era, such mortality control as was achieved in primitive and pre-modern communities stemmed more from advances in technology, including improvement in the food supply, and from the maintenance of political order and protection than from behavior explicity intended to maintain health.

Measurement implications

a. If we consider any individual separately for purposes of measuring his health status, we must ask: How well does he function at a given

moment? That is, is he well enough as a biological system to carry on his major social roles; is he well enough emotionally (as a member of a society and as a member of the various social groups to which he belongs) to accomplish this end; and does he have a sufficiently high moral evaluation? These are all questions which relate to the quality of his life, as distinct from its quantity. But we must also ask, how long has this individual lived up to this point and what is the duration of his life likely to be, given the quality of his life at this moment? We thus bring in some estimate of the quantitative dimension of health and add it to the qualitative.

b. If we consider any group or aggregate of people for purposes of measuring its health level, we simply aggregate, in some manner, the various measures of the quality and quantity of life of all individuals comprising it, as indicated above. This says nothing about the health level of the group qua group; it relates only to the health level of the aggregate of individuals comprising it. For this purpose the quantity of life is readily measured by conventional mortality rates or life expectancy.

c. If we consider any group as a cultural, societal, or civilizational collectivity, or as a community, for the purposes of measuring its health quotient, we have to consider measures of the quality of life in that collectivity as lived by individuals at any given time, and measures of the quantity or duration of existence of the collectivity itself as a collectivity and independent of the lifetimes of any individuals comprising it. From this point of view, the health status of individuals and the health levels of groups may be independent of the societal or civilizational health quotient; a healthy individual may exist in a sick society or civilization and a sick individual may similarly exist in a healthy society or civilization.

IV-The Quantity Versus the Quality of Life as Components of an Index of Health

Another major issue in defining the concept of health stems from its multi-dimensionality. In the broadest terms, health may be considered as related in some way to both the quantity and the quality of life. This is true regardless of whether we are considering the health status of individuals, the health levels of aggregates, or the health of collectivities. Within each of these, the problems are:

a. What indicators shall we use to measure the quantity and what indicators shall we use to measure the quality of life?

b. How shall we add these indicators into an index, i.e., what weight do we give to each?

The quantity of life may be thought of as uni-dimensional since it is measured along a continuum of time. However, various indicators have been used to measure the force of mortality on population aggregates; perhaps the best-known of these are the crude mortality rate, the age-adjusted mortality rate, the infant mortality rate, the proportional mortality ratio, and the expectation of life.

A major problem underlying all of these measures (except the infant mortality rate) is that the weights assigned to each year of life are implicit rather than explicit; clearly, they should be explicit before indicators of the force of mortality are selected to be included in an index of health. Also, some measures give more weight to certain ages than to others; for example, the expectation of life is affected much more strongly by changes in mortality during infancy than at the older years. This may be in accord with the values of our society, or it may not, and empirical research along these lines is sorely needed. Also needed is research on the statistical relationship or degree of association of the various measures to each other, so that we may know whether any one may be validly taken to represent the others.

The quality of life, by any analysis, is best thought of itself -- like health in this respect -- as a multi-dimensional concept. But in accordance with the framework offered here, the quality of life may be thought of as consisting of the following components:

a. A bio-medical component.

b. A socio-emotional component.

The bio-medical component of quality relates to the degree to which an individual is able to function free of bio-medical illness or impairment. The extent to which bio-medical illness or impairment results in some form of disability or less-than-perfect functioning is a key factor here, as is also the extent to which it results in a shortening of life. Asymptomatic illnesses or conditions, or illnesses or conditions in a pre-symptomatic stage, may not result in disability or less-than-perfect functioning; nevertheless, they may result in shortening the affected individual's life. The bio-medical component of the quality of life is affected by all of these. But a complication of measurement of the bio-medical component is that an individual in perfect health along the bio-medical continuum may die instantly due to some external cause (violence, poisonings, accidents, etc.). This individual moves instantly from one end of the continuum to the other, in the process skipping all intervening stages; this poses a measurement problem.

The socio-emotional component of the quality of life involves at least three first-level sub-components: emotional health, social functioning, and moral worth. However, the emotional health of an individual is to a considerable extent (certainly not entirely) conditioned by his perception of his own social functioning and moral worth. To some degree the individual's perceptions along these lines are correlated with the perceptions of others; to the extent that they are not, a difficult measurement problem emerges. However, this may be solved by using the incongruity of self-perceptions with the perceptions of others as one among other items (a second-level sub-component) measuring emotional health.

How shall we mix indicators of the quantity of life (e.g., life expectancy for an aggregate of population) with indicators of the quality of life (e.g., the number of disability-free days at various levels of disability)? That is, what weights shall we give each indicator used as a component of an index? Unfortunately, all

judgments along these lines must necessarily be arbitrary since no empirically validated criteria have ever been established.

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