Int J Biosocial Med Research, Vol 13(1); 17-25, 1991 1044-811X/91/9/17/$1.50.

Human Health and Homeostasis: I. Who's Healthy?

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Abstract

A significant part of the current medical dilemma stems form the poor definitions and delineations of health and sickness. Some of the reasons are outlined. Most importantly, using a more sophisticated approach, it is concluded that only about five percent of adults may rightly be categorized as clinically well. (Int J Biosocial Med Res., 1991: 13(1); 17-25.)

Key Words: Homeostasis; health definitions; health questionnaires; quality of life; mortality/morbidity.

The man/woman on the street will quickly tell you that everybody's well who isn't sick.

Where does one turn to get a more sober and sophisticated "official" opinion? The obvious answer of course, is the highly recognized health agencies such as the United States Department of Health and Human Services, the National Institutes of Health and, beyond the beltway, the World Health Organization.

And what do they tell us?

- About one in four, meaning approximately 56 million red-blooded Americans, will eventually suffer with cancer.
- It's estimated that 36 million in the USA are afflicted with one of the 100 different types of arthritis.
- According to the National Institute of Mental Health (NIMH), one in four women and one in ten men can expect a serious bout of depression.
- In a given day, over 4,000 Americans have a heart attack...1,000 die.

And if you believe that the mouth is connected to the rest of the body, then you'll be surprised to learn, according to the American Association of Public Health Dentists Subcommittee on Preventive Periodontics[1], that three out

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of four people with teeth have pyorrhea. Additionally, about 20 million Americans are edentulous and of these many, if not most, have lost their teeth because of periodontal disease. Hence, combining all of these epidemologic numbers, it is safe to conclude that approximately 95% of adults in this country have or have had some form of periodontal pathosis. More than that, this has been known for a long time and has appeared in all the standard periodontology textbooks.[2,3,4]

So, there really isn't much difference between the response of the laymen and the experts to this simple question, who's healthy?...they both spew out mortality/morbidity statistics.

Why?

It would seem if we can send a man to the moon that we surely ought to be able to get a handle on what is health?

There are lots of reasons...understandable if not good.

The Binomial Concept

Anyway you cut it, we tend to categorize health/sickness in a black/white configuration. You're either healthy or ill. You do or you don't have cancer. There is or there isn't diabetes. Common sense, if nothing else, would suggest the fallacies that people are all mad or glad or fat or thin. The fact of the matter is that the classical diabetic of today (call him 100% diabetic) must have been the 90% diabetic last year and the 80% the year before. There must, in fact, have been a time when he/she was only 1% diabetic! Hence, there's no question but that part of our problem stems from the fact that there's a lack of recognition of the fact that there is a spectrum from white (pure health) to black (the ultimate in disease).

Different Perspectives

There's another reason for confusion. There is a plethora of experts who have been struggling with this problem for a long time. If you really want more information, check out philosopher David Seedhouse [5] from the Wolverhamption Polytechnic in the United Kingdom. From his vantage point, he identifies four (admittedly arbitrary) theories. They can be variously labeled and differently defined. For practical purposes, some are philosophic and therefore very theoretical, others are of a medical nature, and some even delve into the economic, spiritual, and metaphysical. As one might suspect, each of these theories (and even subsets of these postulates) have their own proponents.

In short, another of our problems stem from the fact that the many different experts come to this issue with widely diverse perspectives which lead them to very different conclusions.

Classical Versus Modern Methodologies

There's a third basis for misunderstanding. For more particulars one should check the book *Measuring Health: A Practical Approach* edited by George Teeling Smith.[6] Incidentally, Mr. Smith is Associate Professor of the Department of Economics at Brunel University, and Director of the Office of Health Economics in London. Additionally, he is advisor on economic affairs to the Association of the British Pharmaceutical Industry and others to numerous to enumerate. In Chapter Three, written by Paul Kind of the Centre for Health Economics in York, there's a description of approximately twelve different assessment methodologies with their strengths and limitations. One of the cardinal points made is at a time when infectious diseases were more commonplace and their ultimate outcome was often fatal, the use of mortality data was a reasonable measure of health status in the population. There have, however, been fundamental changes in patterns of disease and causes of death over the last 50 years. Nevertheless, in the absence of any more suitable measure, mortality data, expressed as standardized rates, continue to be used as a proxy for health status in the population and in determining the allocation of health care resources.

With the obvious shift from infectious problems to chronic syndromes, assessment methodology has necessarily changed from mortality/morbidity markers to quality of life assessment. And it's interesting how this all came about. For example, in one instance, the design of a questionnaire was entrusted to an ll-member panel which included patients, spouses of patients, physicians, nurses and a clergyman. A series of patient interviews were conducted to establish important aspects of daily functioning - as seen by the subjects themselves. By this technique, the Karnofsky Performance Status Index was created (Table 1.).[7] While it was originally designed for use in assessing patients with lung cancer, it has been incorporated in a wide range of other settings. The Index is an ll-point scale describing the extent of a patient's independence and his ability to carry out his normal activity. Each level is given a percentage score (100 = normal; 0 = dead). Since its publication, this Index has become embedded in the literature as perhaps the classic measure, the so-called gold standard.

Thus, we're now embarked on assessing quality of life instead of morbidity/mortality. Secondly, we have now shifted to a recognition of the problem expressed in percentages not unlike the previously-mentioned shades of grey.

Table 1.

Karnofsky Performance Status Index

definition	%	criteria
able to carry on normal; no special care needed	100	normal; no complaints; no evidence of disease
	90	able to carry on normal activity; minor signs or symptoms of disease
	80	normal activity with effort; some signs or symptoms of disease
unable to work; able to live at home, care for most personal needs	70	cares for self; unable to carry on normal activity or to do active work; a varying amount of assistance needed
	60	requires occasional assistance; but is able to care for most of his needs
	50	requires considerable assistance and frequent medical care
unable to care for self; requires equivalent of institutional or hospital care; disease may be progressing rapidly	40	disabled; requires special care and assistance
	30	severely disabled; hospitalzation is indicated although death not imminent
	20	very sick; hospitalization necessary; active supportive treatment necessary
	10	moribund; fatal processes progressing rapidly
	0	dead

New Directions

An excellent demonstration of what has transpired was underlined in 1959 when the State of California's Department of Health received a planning grant from the National Institutes of Health in order to establish a Human Population Laboratory (HPL) for epidemiologic studies. The purpose of the HPL was to be threefold. First, to define and then assess the health, including physical, mental, and social dimensions of persons living in Alameda County, California. Secondly, to ascertain whether particular levels in one dimension of health tend to be associated with comparable grades in other levels; and lastly, to determine relationships of various demographic characteristics and ways of living (including personal habits, familial, cultural, economic, and environmental factors) to echelons of health.

This eventuated in several publications. One of which presented an unique approach to the measurement of health.[8] In a survey of a sample of the adult population of Alameda county, in 1965, respondents were asked a number of questions regarding disability, chronic conditions, symptoms and energy level. From their answers, they have been categorized along a physical health spectrum ranging from a minimum condition defined by inability to work and/or care for personal needs (Level I), to an optimal state expressed by no complaints and a high degree of energy (Level VII).

Table 2. summarizes the questionnaire employed in their study (with modifications by Bloomfield).[9]

Table 2.

Level 1: severely disabled (7 percent of population)
- •do you have trouble feeding yourself?
- •dressing yourself? climbing stairs?
- •getting outdoors?
- •have you been unable to work for six months or more?
- •did you report any of the above? If yes. you are in this category. If no, continue.

Level II: mildly disabled (8 percent of population)
- •have you cut down on your hours of work due to illness or disability?
- •have you changed your work due to illness or disability?
- •have you had to cut down on nonwork activities for six months or longer?
- •did you report any of the above? If yes, you are in this category. If no, continue.

Level III: chronically ill - severe (9 percent of population)
- has your doctor told you at any time in the past year that you have any of the following?
  arthritis (rheumatism) - asthma - cancer - chronic bronchitis - chronic gall bladder trouble - chronic kidney disease - chronic liver trouble - diabetes - duodenal ulcer - emphysema - epilepsy - heart trouble - high blood pressure - stomach ulcer - stroke - tuberculosis- ulcerative colitis
- do you have a missing hand, arm, foot, leg?
- do you have trouble seeing even with glasses?
- do you have trouble hearing even with a hearing aid?
- did you report any two of the above? If yes, you are in this category. If no, continue.

Level lV: chronically ill - moderate (19 percent of population)
- do you have any one of the conditions listed under level III? If- yes, you are in this category. If no, continue.

Level V: symptomatic but not diagnosed (29 percent of population)
- have you ever experienced any of the following during the last twelve months?
  frequent coughing or wheezing - frequent cramps in legs - frequent headaches - heavy chest colds (more than two per year) - pain in back or spine - pain in heart or chest - paralysis or poor coordination of any kind - repeated pain in stomach or rectum - stiffness, swelling, or aching in any joint or muscle - swollen ankles - tightness or heaviness in chest - tire easily, often low in energy - trouble breathing, shortness of breath - chronic sadness or depression, major sleep difficulty - frequent anxiety or worry - sexual problems - major difficulties at work, school, or home
- did you report any of the above? If yes, you are in this category. If no, continue.

Level Vl: without complaints, but low to moderate energy level (23 percent of population)
- do you have about the same or perhaps less energy than people your age?
- do you sometimes or frequently have trouble falling asleep or staying asleep through the night?
- when you have only four or five hours' sleep, are you worn out the next day?
- are you sometimes or often worn out at the end of the day?
- did you answer yes to any two of the above? If yes, you are in this category. If no, continue.

Level VII: without complaints, high energy, robust health (6 percent of population)

- would you say that you have more energy than others your age?
- do you only rarely have trouble falling asleep or sleeping throughout the night?
- when you get only four or five hours' sleep, do you feel only somewhat tired the next day?
- do you only rarely feel completely worn out at the end of the day?
- if you answered yes to three of the above four questions, you are in this group.

The contributions of the questionnaire and particularly as they relate to this chapter should be underscored. Approximately 5-1/2 years later, 86% of the original population were resurveyed.[10] Surprise! The initial questionnaire proved to have extraordinary predictive power. For example, the 45 year old males who at the start indicated to have engaged in six or seven "good" practices lived eleven years longer than those who reported fewer than four. Incidentally, they define good health practices [11] as (1) hours of sleep, (2) weight in relation to height, (3) smoking, (4) drinking alcohol, (5) physical activity, (6) regularity of meals and (7) skipping breakfast. Full particulars will develop later in the seventh in this series of reports.

Nine years after the original study,[12] the predictive profile was sharpened by using only five of the original health practices (omitting breakfast and regularity of meals). Other fascinating conclusions included the benefits of social and community ties.[13]

There are three pertinent conclusions. Firstly, the work at the HPL confirms the exciting innovation potential of health assessment based on quality of life. Secondly, it enlarges and gives more credence to the Karnofsky Scale by adding greater specificity. Finally, it adds to the answer by providing some reasonably specific estimate of how much of the population may be viewed as healthy.

It'll be noted that this analysis of general health (incidentally ignoring specific measures) nets a figure of six percent of the adult population may be viewed as clinically well. It should be recalled that earlier in a study of the oral state and ignoring general health, it was projected that only about five or six percent of the adult population is stomatologically healthy. One must wonder at this extraordinary coincidence if indeed it is just happenstance. As a matter of fact, this magic number seems to crop up in the most unlikely places. Harvey W. Kellogg, M.D., of the Kellogg Sanitarium of Battle Creek, Michigan, said "...of the one-hundred thousand colon operations performed under my jurisdiction not over six percent were normal." The more likely possibility is that about five percent of the population is healthy any which way they are viewed.

A Working Definition of Health

In the light of what has transpired thus far, we submit the following three points. First, health may be defined as a state. For the biochemist, it will be undoubtedly viewed as a biochemical condition. For the psychologist, it's likely to be regarded as a psychologic situation. For the clergyman, a spiritual or moral profile. Be that as it may, health is a state adjectivally qualified by the definer and his/her perspective. Secondly, and additionally, health is a state made possible with a minimum of effort. In other words, the ultimate eventuates by a relatively painless and otherwise smooth-running digestion, respiration, circulation, excretion and reproduction. So, health may be defined as a state made possible with a minimum of effort. Finally, most importantly, the end-result is a maximum of pleasure!

Hence, within these limits, it appears that approximately five percent of the adult population may be viewed as "clinically" well.

However, one of the weaknesses, as we've learned, is that health and disease do not fit the binomial system. Our present definition does not reckon with the early, possibly immeasurable, one percent diabetic and five percent hypertensive.

Summary and Conclusions

In this chapter, we have been struggling with the question of "who's healthy?" We obviously didn't come up with the answer. What we hope we did is to raise the level of consciousness for a greater effort to resolve this problem.

What we did do for sure is to focus our attention on the fact that fewer, in fact many fewer, people are indeed well. As a matter of fact, we can say with some reasonable certainty that only about five percent of the adult population can qualify as being "clinically" healthy.

We also can report with some assurance that many, possibly most, conceivably everybody can be categorized as being "subclinically" ill.

So, our next task is to try to sharpen our figures about "who's healthy?" by looking into that presently immeasurable area of subclinical state. There is reason to believe that with a conceptual change, one can better sort out the subclinical problems, the area between five percent and zero.

This will be our job in this series of reports by means of a look at the philosophy of homeostasis and the practicability of the homeostatic model.

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