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CONSUMER BEHAVIOR: AN EPIDEMIOLOGICAL PERSPECTIVE

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My interest is epidemiology and preventive medicine. Epidemiology is the study of disease distributions in man. Preventive medicine is the attempt to avoid acquiring the risk factors of diseases by individuals, which can be called "primary prevention." Also it is the attempt to avoid development of diseases among those who have risk factors, and that is known as secondary prevention. Quite clearly there is much concern about epidemiology as the basis for preventive medicine and about preventive medicine as a potentially cheaper and easier way to provide quality medicine. Health education is a clear dimension of preventive medicine.

We have started to define epidemiology and we have started to define preventive medicine. Before we go any further, I want to tell you what these things really are in a way you will remember. I want you to imagine there are three kinds of people who come upon a scene where there are folks floating down a river, drowning. There is one kind of guy that comes on this scene, rips off his coat and pants, swims out and saves somebody, struggles back to shore, goes back out, saves somebody else, keeps that up until he is exhausted. There is another guy who comes on this scene and says, "Boy, is he wasting his time." He goes back in the woods and maybe an occasional fellow goes by in the meantime, but he gets big logs and throws them in, so he saves several people at a time. Then there is the third sort of individual who goes up river to see who is throwing people in the water. That is an epidemiologist and what he does, if he's bigger than the guy throwing them in, is called preventive medicine. I learned this when I became a preventive medicine officer in the army, but when I came to the University of Missouri, I discovered that there was another person that the Army did not know about. There is a fourth individual who comes upon the scene and goes into the woods and immediately starts doing research on how to grow a bigger tree!

I'm interested in consumer behavior and the health marketplace,

insofar as it helps the health of the consumer. I am not interested in the health of the marketplace. I feel a certain opportunity and obligation as a part-time practicing physician to cite some relevant points from an epidemiological perspective. I would like to talk about the impact of the health marketplace on the health of the consumer and the consumer's behavior on the health of the consumer.

One of the problems we face in epidemiology is that we do not have a massive body of data of any significance on health. We have no direct way of measuring health; thus I will, of necessity, be reasoning from poor data because the data is on death or disability, and what we are trying to talk about is health. In any event, I am going to use these data since it is all we have.

When you start talking about the influence of people's behavior on their health, a reasonable index of ill health is mortality, or early mortality. Figure I illustrates the mortality of individuals, by single years of age, who were born during the same period of time. These people were all born between 1926 and 1930.¹

Initially, there is obviously a very clear difference in mortality by race and sex. I have included data on white males and females and non-white males only as sufficient to illustrate my case. We can be reasonably sure of these data because they are based on death certificates and census and they are usually about the most reliable we have.

First of all, there are three very distinct phases of the mortality experience of groups of humans. The point is that the general shape of these curves is the same. First, there is a period of time, starting from about age 3 and going to age 10 or 12, during which mortality rates fall almost linearly as a function of increasing age. For every year survived, the survivability, or the risk of death, is greatly reduced. Second, there is a period of time, in the later years, during which mortality increases in a linear way on the graphs using a semilog scale. This is exponential with age, which means that about every 8 or 10 years the "all causes" risk of dying doubles. Finally, in between the two extremes of life there are some very interesting things. During the years from about age 12 to about age 30, the leading cause of death is automobile accidents, but other causes include homicides, suicides, other kinds of accidents and, on occasion, war. The highest peaks in the chart are the results of war. These are some very basic facts which say that people's behavior has a great deal to do with mortality risk.

The other thing we can do is look at some of the leading causes of premature mortality among individuals. Most of us would accept as premature mortality the death of individuals between the ages of 45 and 60. Figure II presents a list of the leading causes of death with the male-female ratio to point out some other differences in behavior.²

FIGURE I

Cohort Mortality Rates for the 1926-1930
Birth Cohort. U.S. Death Registration

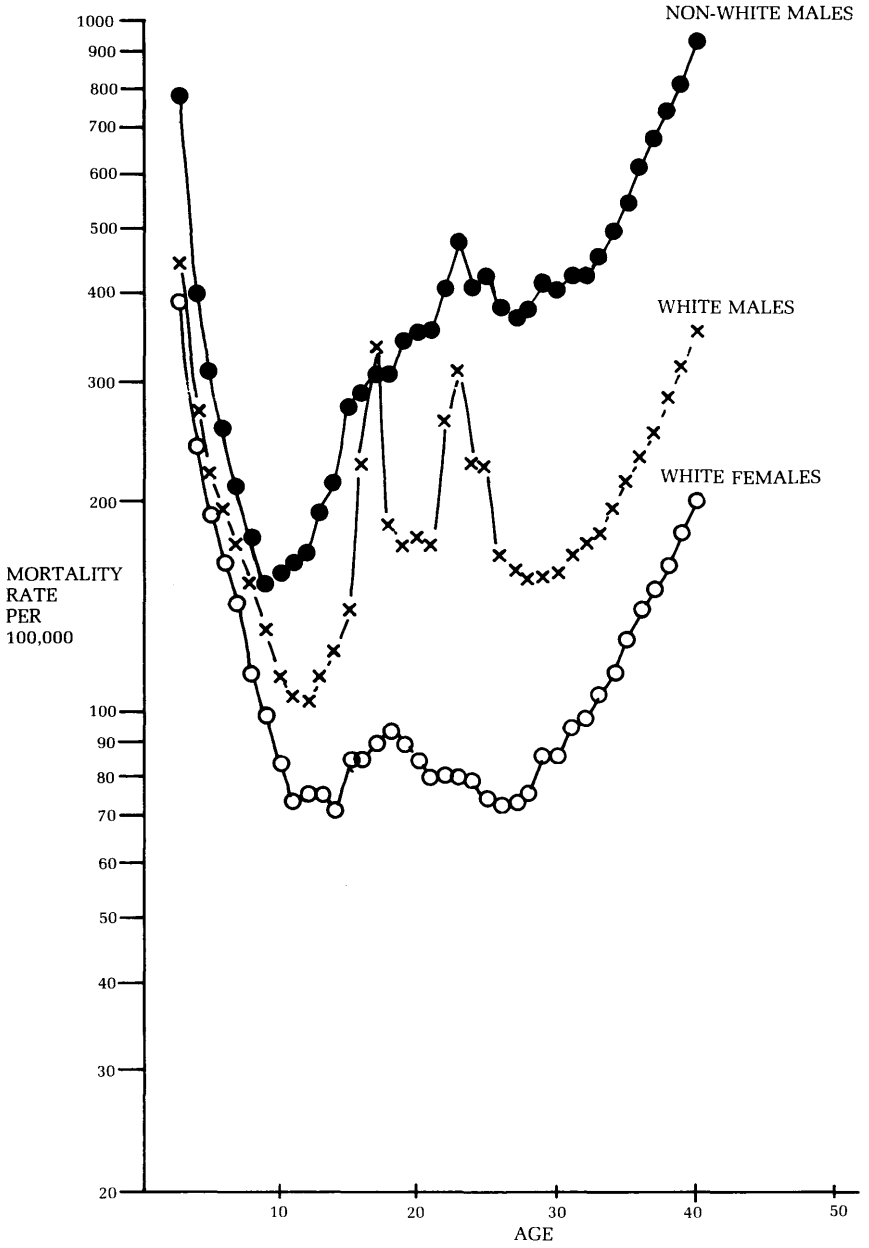


FIGURE II

Probability of Death for White Males, aged 45–49 in the Next 10 Years from Specific Causes with Male/female Ratios and Sociocultural Risk Factors. U.S. 1968

Cause of Death	M/F Ratio	Cultural Characteristics Reinforced by Marketplace
1. Arteriosclerotic heart disease 3539/100,000	4.9	Cigarettes Masculinity Non-dependent Driving—Type A person Obesity—food intake Sedentary life style
2. Malignant neoplasm of the lung 586/100,000	3.4	Cigarettes
3. Cirrhosis of the liver 453/100,000	1.9	Alcohol
4. Vascular CNS lesions 385/100,000	1.2	No b.p. check
5. Motor vehicle accidents 360/100,000	2.7	Risk taking behavior Drive fast No seat belt Increased exposure Alcohol
6. Suicide	2.2	Alcohol Mental illness untreated

Here we have listed some things that are cultural characteristics and relate to mortality data. I am in agreement that lifestyle diseases are critical in this society. The issue is how are we going to deal with people's lifestyles. Just a few of the known risk factors for arteriosclerotic heart disease, malignant neoplasm of the lungs, cirrhosis of the liver, vascular CNS lesion, motor vehicle accidents, suicides which are the first six leading causes of deaths among males in that age group, are listed in Figure II. The male-female difference emphasizes that we must know something about the distribution of the behaviors as they are related to sex as well as the fact that these behaviors relate to the causes of death listed. Taking this point further, Figure III illustrates the same thing with the added dimension of race.³

Again this data serves to emphasize that the high male-female ratios are not race dependent. They occur among blacks as well as whites. There are some causes of death that are very prominent in blacks that are not so prominent in whites, but by and large the

FIGURE III

Probability of Death for Non-white Males, aged 45–49, in the Next 10 Years for Specific Causes of Death with Male/female Ratios for Non-whites and Ratio of Non-whites to Whites for Males.

Non-White Male, Aged 45–49	Black Ratio M/F	Male Ratio B/W
Cause of Death		
1. Arteriosclerotic heart disease	1.8	1.1
2. Vascular CNS lesions	1.1	3.4
3. Lung cancer	6.0	1.6
4. Homicide		6.2
5. Cirrhosis	1.6	1.9
6. Pneumonia	3.2	2.2
7. Motor vehicle accidents	1.5	4.2
8. Hypertensive heart disease		1.1

general types of relationships hold. This provides some very impressive evidence from epidemiologic data that an individual's behavior and lifestyle are critical influences on health even during the early periods when auto accidents and homicide are leading causes of death.

The next approach is to question what evidence there is that the health marketplace is critical to mortality, especially early mortality (and here let's think narrowly, at first, in terms of doctors, nurses, hospitals and clinics).

The evidence is not very impressive. If you look for epidemiological evidence that the health marketplace in the narrow sense is a critical factor in mortality rates, it is difficult to find. A colleague of mine at the University of Missouri is studying geographic variations in disease mortality in this country by county. His data shows that Nebraska contains a significant number of the United States counties with the lowest mortality rates. These counties have had low mortality rates for the last 2 or 3 census periods, starting in 1950. This is clearly not a random occurrence. My guess is, though, that the doctor/population ratio is high in Omaha and Lincoln, but not high at all in the parts of Nebraska where we find these lower mortality rates.⁴ I have done similar studies on Missouri data which demonstrates precisely the same point. The distribution of physicians and the distribution of reduced ill health, at least as measured by mortality, is not related.

Efforts to modify the health marketplace using non-traditional approaches have been undertaken. Some of the most impressive of these are illustrated by the Kaiser Permanente plan which involves massive health screening programs made available to large numbers of individuals. The Kaiser plan has done considerable work in

evaluating the impact of early disease detection, which is a critical part of the medical care plan. These studies are reported in *Preventive Medicine*.⁵ The authors report efforts to evaluate the impact on mortality of the availability of widespread health screening facilities for early disease detection. Conducted over a seven year period with many thousands of people, these studies conclude that health screening has no statistically significant difference in mortality. Here we created an impressive difference in the traditional “health marketplace.” They decided that they were going to promote preventive visits. This was a very good study in which the population was divided randomly, and one half of the people were called and reminded to have preventive care checkups. The other half were not denied preventive checkups if they asked for them, but they were not pushed either. Results show that about 75 to 80 percent of the people in the encouraged group had preventive checkups, and about 20–25 percent of non-encouraged had them anyway. Over a seven year period with many thousands of people participating in the studies, no significant difference in mortalities was recorded. Slight differences were found in the direction you would expect but nothing that approached statistical significance. This study indicates that even with relatively major changes in the traditional “health marketplace,” we do not find marked changes in mortality.

Another approach to assess the impact of the health care system was an attempt to study the effects of continuing care on 150 elderly people.⁶ Half of this population received continuous visits by nurses and half did not. This approach was evaluated very carefully, using visits to other providers, number of days spent in the hospital, number of days that the people were fully ambulatory and such things as mortality.

First of all, there were no differences in mortality. It did not make any difference, over time, whether the people were repeatedly visited or not. There were more hospitalizations among those who were visited than those who were not. For those who had limited social contacts and were in a lower socioeconomic status, being visited by the nurse turned out to be a substitute for going out and meeting people. They had fewer social contacts outside the nurse during the period of time they were being visited by the nurse. There were some beneficial things that you could see such as the lessening of the disability associated with illness like arthritis that might be affected by specific physical therapy measures. Thus, there were some things that could be good, but overall results were not impressive.

What I am leading up to is the notion that aspects of the marketplace, other than what we classically discuss and consider as the “health marketplace,” seem to be more critical in how an individual’s life is spent. At least, the time and mode of exit (death) is more strongly related to other aspects of the marketplace than those we

usually think of in terms of health and diseases, i.e., doctors, nurses, clinics, hospitals, etc.

It seems that the "health marketplace" might include all the sales of goods and services that affect health, and if you take that kind of a definition, then in time, there are all kinds of things that affect health which are not usually directly associated with it. Obviously some of the things we have referred to, such as cigarette smoking and alcohol use, eating patterns and patterns of exercise, are part of a whole list of activities with major behavioral factors that influence an individual's life. These things are all influenced by the marketplace. In order to say that, we have to accept that the health marketplace is not only doctors, hospitals, clinics, and nurses. Thus, the health marketplace is not what it appears to be. Those activities which characterize our culture and directly affect health are not really under the control of medical professionals.

Additionally, our current definition of medical practice is really not designed to help physicians improve their insights into these sorts of things. In the foreseeable future, we will continue to concentrate on medical care for the acutely ill. And there are many reasons for this. One is that it is easier. You can do something for the sick patient.

Dr. Hans Mauksch, the director of our human ecology section at the University of Missouri and presently the Executive Secretary of the American Sociological Association, maintains that the sicker people get, the more they become alike, and, if you want to carry that further, you could say in death we are all equal. He was using that concept to illustrate that there were some very important unifying sociological principles which can be developed in studying hospital patients.

If you talk about preventive medicine, as to what that term really might mean, it refers to people who are not sick at all. Here are "people" instead of "patients." They are totally different and must be met on their grounds and must be met with an understanding of their motivations. This is especially relevant to health education. Preventive medicine is more time-consuming than other approaches to care; it tends to be more frustrating because our level of knowledge is not what it is in terms of acute illness care. I honestly do not believe that the science of preventive medicine is so developed that if we provided the mythical classroom experience and gave the preventive medicine people all the resources in the world to deal with, and we set out to make changes on the basis of our current conceptual framework, that we could achieve the magic changes in health that we would like to see. We have just not got the expertise, the experimental or observational data that would allow us to say precisely what things we ought to be doing and in what order. I think there is some expertise, and we have notions about where we can

look for the first impacts, but I don't think that there is evidence that the knowledge we have is conclusive.

There are some bright spots, however. There are some things that need to be looked at a little differently. Initially, there is the newly popular area of family medicine as a separate specialty. Family medicine right now does not deal with families; it deals only with the illnesses of people one at a time, even though all of them belong to a family. But potentially, as family medicine develops an academic base which includes its own research, there will be an increasing emphasis on the aim of treating the family as a unit. The name is fortuitous because it demands that you consider the family as a social unit the smallest group to which an individual belongs. We can't keep calling ourselves family practitioners without eventually asking something about what it means to take care of the family.

There is a considerable amount of evidence that families influence people's health. There is information about exactly what dimensions of a family's inter-relationship do, in fact, influence health and through what mechanisms. I have done some survey research on health-related behaviors. These studies demonstrate that interpersonal stresses between family members influence health behaviors of children in families.⁷ But is should be expected that there will be a long "incubation period" before that will affect the health of those children. Unfortunately, there is remarkably little research on the family as a unit. I see family medicine as having the responsibility of almost forcing us to consider the family or change its name.

The second thing of potentially considerable value I see is the development of preventive medicine as a separate practicing specialty. Currently, there are no such activities in medical schools, as far as I know. Preventive medicine people have not been involved in medical practice, certainly not in medical centers and certainly not much of anyplace else. The development of health maintenance organizations and family medicine leads to the increasing realization that there is a need for a body of knowledge that relates to preventive medicine. There are, in fact, a fair number of clinical activities which deal with disease and disability prevention. Out of such activities could be developed research bases to lead to some real changes and insights into the factors that affect people's health. I have a friend in California now engaged in the private practice of preventive medicine who does nothing but essentially provide preventive medicine services. His clinic nurses check such functions as blood pressure, cholesterol level, urine sugar and intraocular pressure. Theoretically, we would also check for other patterns if we knew that they were more important and capable of modification. For example, we can screen for smoking habits, eating patterns, exercise patterns, or social and emotional problems related to how you get along with your wife, your children, or anybody else who is critical

for your emotional well-being. At present, however, it is not the screening set up that is the problem; it is the lack of effective follow-up treatment to alter what we find. It is not difficult, for example, to find out who is smoking and who, therefore, risks a whole variety of diseases from that exposure. This difficulty is to decide what to do about it. As a physician, I can assure you that if you give me a group of people who smoke, drink, and are overweight, at the end of six months to a year of management I will give you back a group of smoking, obese, drinking, but worried people.

If we intend to make intelligent efforts to address the issues of diseases that arise from lifestyle, there are a number of things we must be prepared to do. I recently read the book called *Subliminal Seduction*.⁸ It talks about how the marketplace is, in fact, manipulated by people who have developed a science of manipulation. That science is practiced, studied, and developed. Thousands of studies have been conducted for marketing purposes, none of which are published, none of which are available in the scientific literature. They were not created for scientific research; they were created to make money. Advertisements were tested on thousands of people. That is more testing than we have done on many of the anti-smoking materials which show how lung cancer goes up when smoking goes up. If we had shown those graphs to a thousand people, we would have discovered that they would not quit smoking after looking at the ad.

We have got to deal with subliminal inputs of the type described by Key in *Subliminal Seduction*. Alternatively, we have got to provide different prescriptions for handling specific problems, either through primary prevention or secondary prevention. If an individual wants to quit smoking, we ought to be able to find a way to turn a TV set into a reminder not to smoke. We should know enough about this kind of thing to perform the equivalent of social of education "immunization" against some of the impact of harmful advertisements.

In all the other types of prescriptions we write, as physicians, we recognize that we have to use different regimens for different people, use different doses and different durations of therapy for example. We need to know about these kinds of things in terms of primary and secondary preventive treatments, too, if we are going to be successful with preventive medicine. This is clearly beyond any data that we now have available. We have tremendous needs to develop conceptualizations of health or, at least, less disease-dependent conceptualizations that we have currently.

There was a recent article in the *Annals of Internal Medicine*⁹ on the behavioral approach to studying diseases. It indicated that first of all we need to conceptualize health and disease in terms related to the individuals' physical, social and psychological role in his set-

ting. To study the health-disease spectrum we must be prepared to accept quite different notions of what medical practice can be and how it can be carried out. I look to preventive medicine to be a separate practice, in large part, because I can assure you that medical students and doctors in the future will not be doing all the things that the preventive medicine faculty of today's medical schools would like to have them do. The basic reason is competition for the students' learning time. The ophthalmologists expect them to learn more ophthalmology, the neurologists expect them to do more in neurology, the orthopedic surgeons expect them to learn more orthopedics, the anatomists do not want to lose anatomy in the shuffle, the physiologists certainly do not want to lose physiology. Now the behavioral scientists are chiming in with all kinds of things and want to talk about preventive medicine. There are enough sick people in the country that just taking care of the sick people is going to occupy most of the doctors we are turning out for a long time. A new approach is going to have to be developed using non-physician time, but with physician cooperation.

Everything I have said supports four major conclusions: (1) if we are interested in people's health, we must expand the current notions of what the "health marketplace" is, (2) major changes in health for our population will only be achieved by changes in this expanded "health marketplace" to affect consumer behavior, (3) health education, in the broadest sense of planned behavior change, is critical to the changes which need to be made, (4) the medical profession's contribution should come from the birth of family practice and the emergence from hiding of preventive medicine into a separate specialty with clinical practice which includes life style interventions desired by the "consumer."

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