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## DISCUSSIONS

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- BUCK:** We sometimes forget that the term etiological refers not only to causes of disease, but to causation in general; that a well-done investigation of factors affecting the outcome of illness or the prevention of disease uses the same rules of inference as an etiological study of disease causation. I realize it is awkward because etiology in most people's minds means only disease causation, pure and simple. But in terms of science I think we should be right in the way we classify things.
- TERRIS:** I agree, but I also think it is terribly important to differentiate between the evaluation of health services and etiological studies. The whole history of epidemiology has been the history of etiological studies. That has been the main emphasis. Now we are moving into an era when people want to take a really good look at what they are doing. We have come to the point where we now use observational studies and experiments to conduct etiological studies and to evaluate health services. In Latin America, for example, they want to use epidemiology to evaluate available health services, including medical care services.
- LLOPIS:** The problem is that the word evaluation might be too broad. We should distinguish between an evaluation of the outcome of health services and an evaluation of how health services provide medical care. Epidemiologic evaluation should be limited to an evaluation of the outcome.
- TERRIS:** Right, we are not interested in whether people are satisfied with health services. That is a different kind of evaluation; it's not an evaluation of outcome.
- NAJERA:** But even the process of or the satisfaction with health services could be evaluated epidemiologically, and the methodology would be basically the same. Increasingly, the term "health service research" is being used to describe this. As scientists we should emphasize that epidemiology is the main science in health service research.
- TERRIS:** In my opinion, epidemiology should stick to the evaluation of outcomes, the *effect* of health services on health. The rest

is traditional health service research: it's sociological, political, or economic. The field of health service research has been taken over by the medical care people, and, as a result, we have all sorts of studies of resources, physicians, number of beds, financial issues. That's all that anyone studies now—costs. But the whole emphasis is wrong. What we want to have as the keystone of health service research are epidemiologic studies of outcomes. We should be very bold here and say just that.

**NAJERA:** In my opinion, there are three main uses of epidemiology: planning of health services, organization and management of health services, and research on causation and new study methods. Since the fifties or sixties everyone has agreed that epidemiology is the basic science for planning, organizing, and evaluating health services, but, save for evaluating vertical programs or a certain type of medical care, it has never really been used for this. Consequently, health services have evolved, for the most part, in a very anarchic way: changes have resulted from the needs, demands, and desires of doctors and other personnel, with a very limited evaluation of health problems or health outcomes. Not even in socialist countries has epidemiological knowledge of health status been used to plan services. This probably results from the difficulty in changing services that are already in place. This means that one of the objectives for epidemiologists is to find out how epidemiology can be used to improve existing services. In other words, can we suddenly curtail one type of service to create another type of service when the resources—the hospitals, the people—are already there? I think that this is a major limitation that has never been addressed, and until we do so we will lose a big part of the limited financial resources available. We have to be aware of costs. Epidemiology that doesn't look at costs scientifically is not epidemiology. Epidemiology should, therefore, not only take causation but health services into consideration. The whole thing is really on a continuum: the investigation of causes at one end and the investigation of outcomes at the other. If we don't consider health outcomes, we cannot really modify the services.

**TERRIS:** The process of taking health outcomes into consideration has already begun. For example, take the Lalonde Report in Canada and the United States Public Health Service's *Objectives for the Nation*. They are both revolutionary documents. A revolution is occurring, a revolution that is symbolized by a paper which Pineault, Contandriopoulos, and Lessard published in the *Journal of Public Health Policy*, called "The Quebec Health System: Medical Care Objec-

tives or Health Objectives?" The Quebec paper is a brilliant discussion on objectives, on what the issues really are. Let me read to you their list of examples of medical-care objectives and of health objectives. For medical-care objectives they have: insure adequate availability of resources, make health services available to the population, insure the quality of care components (professional norms), achieve universality, maintain continuity, increase the degree of productivity. For the health objectives: reduce mortality from cardiovascular disease, reduce mortality and morbidity from accidents, reduce the incidence of childhood infectious diseases, increase the proportion of elderly maintaining an adequate degree of autonomy, reduce the incidence of sexually transmitted diseases. That's the issue. In the same journal, Tulchinsky wrote an article on Israel and made the same point: "Medical Care Objectives or Health Objectives?"

Let me give you an example of what this approach can mean. When we were in Havana for PAHO, we looked at the data collected by Cuban epidemiologists from the Institute of Cardiology. The data indicated that in Havana only about 25 percent of the population age 40 and over had serum cholesterol levels under 200, meaning that 75 percent had abnormal serum cholesterol levels. We expected that, because they have a high rate of coronary heart disease in Cuba. But the interesting thing was that the women had higher serum cholesterol levels than the men. This is very unusual, as you know. Then we looked at the mortality data and, sure enough, while in the United States the ratio of male to female mortality for ischemic heart disease is 2 to 1, in Cuba it is 1.3 to 1. Now we know why the mortality in Cuba is not so different between men and women. This kind of study by epidemiologists is terribly important. For Cuba, it means that when they try to do something about heart disease they have to pay a lot of attention to women; they also know that their problem is that three quarters of the population age 40 and over have abnormal serum cholesterol levels. If you go to India, however, you won't find this. Another good example are the studies in the Soviet Union that show that if you check serum cholesterol levels in the Central Asian Republics, there are not many people with high serum cholesterol. But if you do this in European Russia, in the RSFSR, it's like Europe; serum cholesterol levels are high. This is the kind of study where epidemiology can play a major role. It's applied epidemiology.

The real problem is that, in trying to carry through such a revolution, we run up against the medical profession, and the medical profession is committed to therapy. They can-

not see prevention. It doesn't matter whether a country is underdeveloped, socialist, capitalist; this happens in every country in the world.

Epidemiologists should participate in studies to determine the best ways to deal with the problem of health service research. We have to lead that revolution in the public health profession. But it won't be easy.

**NAJERA:** Health service research has become more and more important in the organization of health services. But without epidemiology, health service research is just administration. It concentrates on better administration, better management techniques.

**TERRIS:** We should claim an aspect of health service research for epidemiology and make this aspect its primary emphasis. The economists have taken over the field and we've got to take it back from them.

**BUCK:** One thing I would like to see is the use of health statistics to suggest epidemiological research. Wouldn't it be nice if by using health statistics we could demonstrate that the major health problems of a country are not always those on which most of the money is spent, such as in the glamorous tertiary-care centers?

**TERRIS:** I have another recent experience related to this use of research to set up priorities. Not long ago, I spent a week in a Latin American country visiting with the Deputy Ministers of Health. They were all young clinicians with no public health training; they had youthful enthusiasm but not much background. I kept asking for the leading causes of death and they claimed they didn't know; they could only tell me what they saw in the hospitals. In desperation, I asked for the mortality statistics and they brought out the computer sheets. I looked at the data for the country's capital, since there, unlike the rural areas where they have very few doctors, the diagnosis would be reasonably accurate. They had excellent data for both men and women; everything was laid out on the computer sheets. Since we knew the size of the population, I spent the afternoon figuring out the mortality rates with a borrowed hand calculator. They had not done it because they were not trained to do this kind of thing. I then presented the data in a talk to the staff of the Ministry of Health. I was surprised to find that, young as the country's population was, the leading cause of death was heart disease. My audience couldn't believe it. The third leading cause of death, higher than infectious and parasitic diseases, was injuries. They

couldn't believe that either. It was hard for them to accept the concept that injuries are important. They are doctors, and for doctors injuries are not diseases; they are another kind of medical problem. I couldn't convince them. The health officer responsible for the capital region said that the major emphasis still had to be on infectious disease. Well, it certainly should be a major emphasis, but not if they pay no attention to the injuries that kill more people than the infectious diseases. And let's not forget that heart disease is the leading cause of death in most of the countries of Latin America.

**BUCK:** We should stress the importance of evaluating health services in terms of specific health outcomes. When a final outcome is too difficult to observe, we can at least examine an intermediate outcome.

**TERRIS:** One of the ways to evaluate health services is to see who gets what, how needs are being met—even in cases where there is total access to care, where everyone has access. If you look at the way, for example, teachers use the health services versus the way manual workers use them, there is a tremendous difference. There is an educational and cultural difference.

**BUCK:** Well, I guess the most vivid illustration of that comes from the studies of social class that show differences in psychiatric treatment: the upper classes get psychotherapy; the lower classes get drugs because there isn't the rapport between the doctor and patient to make psychotherapy pleasant or feasible.

**TERRIS:** That is why we need nurses to work with the patients. That is why patients prefer nurse practitioners to doctors. Nurses are more down to earth and most doctors are so arrogant.

**NAJERA:** There was also a very nice study done in the United States which showed how medical school students lose their social conscience. According to the study, in the first year of medical school up to 80 percent of the students had very strong social interests. This is why many of them had chosen to study medicine in the first place. But by the time they graduated, the percentage had dropped to 20.

**TERRIS:** I would like to raise an issue that I think clinicians ought to understand: health should be approached in terms of continua, not in terms of hard-and-fast categories. This is a very important concept. Yet clinicians do not understand

this because medical training is always rather rigid; it uses a yes/no logic with no room for gradation.

The issue of hypertension is a good way to illustrate this. My cardiologist, for example, is very happy to get my blood pressure just below 140/90. But all the studies show that the lower the blood pressure, the longer you live. There is no sharp dividing line between normal and abnormal. The same is true of serum cholesterol. In the early days of the Framingham study they seemed to be saying that 260 milligrams percent or above is bad, everything else is all right. But now they emphasize that it is a continuum: the lower you get the better. Below 200 does not seem to matter very much, but the minute you start going above 200 you are at risk.

Another way to illustrate the rigidity of medical training is with the difference between statistical normality and physiologic normality. For serum cholesterol levels, for example, statistical normality for American males age 40 is around 230, with two sigmas on each side; physiological normality is under 200. The two are very different, but this is not understood. In one of our epidemiology exercises we reproduce the lab report card from my hospital, which, like a lot of other places, gives the normal figures for serum cholesterol as 220 to 260, when actually it is under 200. Hospitals do this because they are going by statistical normality instead of physiologic normality. In dealing with cardiovascular diseases it is very clear that we are dealing with continua instead of rigid definitions, and the question of statistical versus physiological normality is also important. Yet no one has ever discussed these as philosophical issues, which they really are, they are basic concepts.

**BUCK:** I think these issues have been addressed in the course of the last decade, but they haven't made it into medical journals until much more recently.

**TERRIS:** They certainly are not addressed in medical schools, particularly not by clinicians. Ask clinicians what is hypertension: "It's above 140/90," they say. There is no concept that, compared to 100/70, anything above 120/80 is really hypertension.

**BUCK:** Careful, though. We know that the clinicians are partly right. To get blood pressure much below 140/90 or to get a North American's cholesterol below 200 may require measures so drastic that you will be doing more harm than good.

**TERRIS:** I do not agree. My doctor, who was always satisfied when

my blood pressure was at 140/90, put me on a new drug and it came down to 130/80. It was not so hard, he just used a different drug. I had been trying to tell him to please do something like that. And as far as serum cholesterol is concerned, it does not take heroic measures. I used to have 245 milligrams percent and then I went on the prudent diet and it came down to 200, and it has stayed there ever since. Diet is critically important when it comes to serum cholesterol levels. Take the case of Vietnam: they live on a rice diet, and since they don't eat meat or fats, they don't have much heart disease. Another good example is Eastern Europe. Once they did not have meat, milk, and eggs. They worked hard to get them and their coronary disease rate rose sharply. There are, of course, individual genetic differences, but it is very hard to have high serum cholesterol when you are on a rice diet.

I think these are concepts which doctors and clinicians ought to understand, but it is difficult since the teaching is all black-and-white. Do you know what the medical students say when I give them my two hour exercise on cigarette smoking and lung cancer? They say that we are wasting their time. They do not want to learn all this junk that I am teaching them, it's too methodological. They just want to know whether cigarette smoking causes lung cancer, yes or no. That way they can answer the exam question. I can speak like an expert on this, because I have spent most of my life teaching medical students, and I can tell you I deserve a medal for that.

I have yet to meet a teacher of preventive medicine in a medical school who is happy. Once a teacher told me how happy she was teaching epidemiology at her university and how wonderful it was because the students were eating it up. A few months later there was a strike of the students against her teaching program. When I went to the medical school in Costa Rica and told them about this and about my own troubles they were so glad to find that they were not alone. I visited the famous medical school in New Delhi, India, and found posters all over the medical school building attacking community medicine in the most insulting terms. The federal government had decided that medical students should spend six months instead of three doing community medicine in the rural health service. You should have seen those posters. The students went on strike and won. The term was reduced from six months to four.

**NAJERA:** You cannot change the mentality of medical students. By then it is too late. The change must happen earlier.

**TERRIS:** That's true. I taught first- and second year medical students and it is already too late. By then they are learning microbiology, anatomy—big subjects. Why should they bother with this junk, they think. That is their attitude. And isn't it part of the problem of the future of epidemiology and public health also a prestige problem? If you go to a school of public health you don't have the prestige that you have in a medical school?

**NAJERA:** Well, at least in Spain, the problem is mainly financial. In the first place, the medical schools are the ones with the money; also, most people go into clinical work because they stand to make more money as clinicians in private practice. The people who go to the school of public health become government employees who make less money.

**BUCK:** That's the problem, isn't it? Low prestige means less money. We are so materialistic.

**TERRIS:** I saw something else in one European country where I talked with the young people in the department of social medicine. These people spend half their time doing clinical work. I asked them how they could do public health when they spent their time doing clinical work, and they answered that you have to combine theory and practice. I told them that that was the wrong practice for their theory. How can you do epidemiology or medical care research when half your time is spent taking care of patients? They don't realize that they are destroying public health when they do that. I bet you this happens in Latin America, too.

**LLOPIS:** Yes. This is one of the problems created by the expansion of the social security systems. The social security systems increased the medical care coverage. It is a medical approach. All activities have to do with patient care because people go there to be treated. As a result, physicians end up being sort of public health administrators. They become heads or directors of health centers and hospitals without the necessary training. And what results is similar to what the British used to say about the French social security system: nine doctors to supervise one.

**BUCK:** Do they still have fee for service?

**LLOPIS:** The main problem with social security in Latin America is exactly the problem of fee for service. Some of the professionals are salaried employees, but many enter into a fee-

for-service contract with the social security agencies. Fee for service has created an overutilization of medical services as well as a number of unnecessary tests and other procedures.

**NAJERA:** Since most social security systems either have evolved from or are still essentially insurance systems, most of these problems are rooted in the insurance system. From an administrative point of view, social security systems look at health problems as nothing more than risks that must be covered. If the users are healthy, they still pay but don't get any service. If they are sick, the system delivers a service for an insurance-covered risk. Health problems are not an issue. There are only diseases.

**BUCK:** After this goes on for a while, the costs involved make prevention seem very attractive. So far, however, prevention has been directed almost entirely at individuals' bad habits rather than at changing the environment that fosters such habits. It is all pretty shortsighted.

**TERRIS:** My guess is that in Latin America today there is socio-political unrest among many epidemiologists without enough of an epidemiological structure to back it up. That is why you read papers full of sociological rethoric that I have tended to deride as being talk. But it isn't just talk. I think we are seeing the beginning of a movement. The whole emphasis now, interestingly enough, is on doing actual research. I think that in all these countries where people talk so much about social epidemiology, what is really happening is that they are not really clear on which way to go. Someone has to assume the job of providing them with an adequate epidemiological knowledge base.

**NAJERA:** I don't agree with your statement that people are doing social epidemiology just because they don't know what else to do, or because they are in the initial stages of a process. Even if we don't call this discipline socio-epidemiology, we must recognize that social factors are so enormously important to the development of disease that they should be analyzed and studied. I have no doubt that social factors have always been the most important factors in the development of most diseases. The difference with which a disease manifests itself in different social groups is evident, yet it is much easier to quantify other factors.

The problem may be that we don't have the right tools or the methodology to study social factors scientifically. Regardless, these limitations should not stop us from attempt-

ing it. We should intensify our efforts and ability to analyze the role of social factors like nutrition, occupation, salary, housing, and so on.

**BUCK:** What we do know is that the successful application of some results of epidemiological research to health care organization requires a change in medical education, basically a change in the selection of people for the health professions.

**TERRIS:** That is akin to saying that it requires changing the medical profession, and I've given up on changing the medical profession. Physicians are going to be therapeutically oriented no matter what you do. You'll waste a lot of time and effort trying to change that. I think we should take a clue from the tremendous change that took place in Canada and in the United States with respect to heart disease and stroke—without changing medical education.

**BUCK:** But we don't know all the reasons for this.

**TERRIS:** I know why. It had nothing to do with medical education. It had to do with primary prevention. We're not talking about secondary prevention, although it is true that the medical profession is very much involved in hypertension control as primary prevention for stroke. They've done very well in Canada and the United States, even though they're therapeutically oriented. You have to give them credit. But, in general, what happened in the United States and Canada had very little to do with the medical profession. It had to do with the fact that the epidemiologists found out about serum cholesterol and hypertension and smoking, and the newspapers and magazines spread this information throughout the country. The well-to-do and well-educated people who read and who are very health conscious said, "By God, we're going over to unsaturated fats." Now they go to the supermarket and buy sunflower oil and corn oil margarine; they stay away from fatty foods; they exercise; they stop smoking; and they get their blood pressure taken care of. It was almost all done by the people themselves, without too much help either from public health or from the medical profession. It was all primary prevention. Before this everyone said that health education could never do anything. Yet we now know that even without an organized program of health education, a revolution occurred. In only ten years there was a 25 percent decline in coronary heart disease and a 38 percent decline in stroke in the United States. So I don't think that we need to worry so much about changing medical education. What we need is

a strong commitment, from both the government and from non-government agencies like the Cancer Society and the Heart Association, to educate the public and get money for primary prevention programs. Forget about trying to educate the doctors; they'll come along. That's my opinion.

**NAJERA:** And yet these are all examples of changes that do not reach the whole population; they benefit only the upper class. It will be very difficult for this type of health education and this type of prevention to reach everyone if the structure of the population doesn't change. Yours is not the only solution. Sure, we need prevention, we need primary prevention, it's the most important thing—but we also need something else.

**TERRIS:** What else do you need?

**NAJERA:** Oh, several things. Among them is changing the physicians.

**TERRIS:** Don't waste your time.

**NAJERA:** We have to try to make a physician who, being concerned with treatment, also thinks in terms of the community rather than just in terms of individuals. We also need to change the organization of health services. In Spain we are trying very hard to do this because we feel that this could be the start of something new.

**TERRIS:** You mean if you have a National Health Service, you'll get this? Do you know what happens in National Health Services? I have met directors of health who were the medical directors of hospitals. They didn't know anything about public health, yet they held key positions in the ministries of health. And I have been in countries where the leading people in public health were all physicians. They were very proud of the fact that every one of them, including the Minister himself, did clinical work one afternoon or one day a week. They really believe this is good "theory and practice." I know of one Minister of Health who was a cardiac surgeon, and guess what got emphasized in his National Health Service? Cardiac surgery and intensive care units; tertiary care. This is what we are up against, everywhere in the world.

**NAJERA:** I'm not only strongly advocating a National Health Service, I am also talking about a change in the organization of the health services towards a community oriented approach.

**TERRIS:** What do you mean by community oriented?

**NAJERA:** Benefitting most of the people, having a positive approach to health, being prevention oriented—and ensuring that health services are in the interest of the community. For me, there is a great difference between what is community oriented and what is only prevention oriented.

**TERRIS:** What's the difference?

**NAJERA:** What is just prevention oriented isn't necessarily directed towards everyone. For example, the target might be diseases that primarily affect the rich. These may be prevented very quickly, but these changes don't touch the whole community. In the same way, the evaluation of a tuberculosis or polio program is only a partial evaluation: it is not aimed at the health services as a whole. But the community will always have an interest in prevention, and this is why I prefer to say community oriented. In my opinion, the big change in the future will be to have epidemiologists use their expertise to perform more comprehensive evaluations of the importance of disease and its causes in the different social classes, occupational groups, age groups, and so forth. Otherwise, what you have described can happen: a mortality reduction for diabetes, or coronary heart disease, or whatever, will not really have reduced mortality or morbidity in all population groups.

**TERRIS:** A talk I gave recently on Canadian health directly answers your comment on the community and prevention. I said that to prevent the major causes of illness, disability, and death, you need a well funded campaign led by Canada's local, provincial, and national health departments. Well funded, in this case, requires only a small fraction of the many billions of dollars which Canada now spends for the treatment of these preventable diseases. Implementing this program—and this is the key point—would mean not only achieving better health for the Canadians, but also achieving equity in health. Just as the Canadian National Health Insurance Program was established to assure equity in medical care (that's what you want to do with a National Health Service in Spain), so must we pursue this aim in the more fundamental goal of improving health status. The available evidence indicates that, both in the United States and Canada, lifestyle modification has been more effective in the more highly educated groups, those who have been to college. That's why it's important to make every effort—that's where you need the money and the programs—to

reach the less educated groups in order to get equity in health. And I'm not just talking about the poor, but about the majority of the less educated people; in other words, 80 percent of the Canadian population. But that's not just community oriented, it is total population oriented.

**NAJERA:** Yes, it is. When I use the term community I mean it to include everyone. Regarding equity in health, I must say that your success with the lifestyle modification among the more highly educated groups certainly has not been because of the equity of the health education system.

**TERRIS:** There has been no health education system. That's the problem.

**NAJERA:** Here you have something that has been successful with one group and has failed with others. You say we need to spend more money; that it is essential to make every effort to reach the less educated. But the question is how? These people have other problems that depend on other factors. Even if they stopped smoking, what then of the factories, the whole economy which depends on tobacco? Up to now, the impact on smoking cessation has been minimal, so much so that the tobacco industry doesn't mind.

**TERRIS:** Not in the United States. That's not true. Tobacco companies are in trouble.

**NAJERA:** Well, they still sell cigarettes outside the United States, in the Third World. And the same is true of other products, dairy products, for example.

**TERRIS:** You know what my proposal is? That it would be worthwhile to put a lot of money—and the United States is wealthy enough to do it—into subsidizing farmers to get out of growing tobacco so that they could grow other crops.

**NAJERA:** Now we are coming to the changes that I meant. We need to stop growing tobacco, maybe we need to reduce the production of dairy products, or change agriculture, but we also need to change housing and occupational risks. We need so many changes of this nature, and I don't believe that they can all be achieved through health education.

**TERRIS:** I agree with you.

**NAJERA:** In order to achieve this level of change I think we need to have the community—the people—participate in running the health services at the decision making level. Therefore,

the big change is in implementing a community oriented approach. We want the people themselves to think of what health services they need. It's only at this level that we will be able to venture into changing the economy, into doing intersectoral development.

**LLOPIS:** But, don't you need to use health education to have the community's cooperation?

**NAJERA:** I don't like the term health education because it has the connotation of something that is being imposed on someone—the teacher who knows and the child that doesn't. I think it fails because this may be good for children, but not for adults. Adults do not want to be educated in this sense. They like to discuss things. This is why I don't use the term health education; I prefer community involvement, because it stresses that you have to get people involved in the discussion.

**TERRIS:** The error you make is to consider health education in a very simplistic way by saying that the role of health education is to get people to change behavior. That's not the role of health education; that's only half its role. The main role of health education is to get political support from the people. In the United States, if we had said in the early days that smoking in restaurants would be restricted, people would have laughed at us. It took twenty-five years of informing people about the dangers of smoking, and then it wasn't the health people that demanded the restriction, people did. They were the ones that said that they did not want to be next to someone who smokes. So, health education is an organizing resource. It's not what you think it is, because you cannot get community involvement unless the community understands the issues.

**NAJERA:** The community will understand them.

**TERRIS:** They will understand only through health education.

**NAJERA:** They will understand immediately, if they are involved in the process, if their interests are the priority.

**BUCK:** I think you have to go further. I agree with the mechanisms for diffusion of change, because I think it's the only way. But you also made reference to factors such as housing, and remember that in our historical section we talked a great deal about the studies of health and social class. It's not just historical. It seems to be true that at the present time,

almost any study you do of any kind of morbidity or mortality shows that the inverse social class gradient continues. There are important environmental causes for this gradient, and they're not all a matter of lifestyle. I'm all for changing lifestyles in a healthy direction. But in doing that you cannot neglect the other causes: housing, education, and occupation; the conditions under which people live, learn, and work today. We may no longer have the satanic mills of the Industrial Revolution, but we still have lots of jobs where there's no creativity, where work is boring, and where there is a fear of unemployment if you object to anything. It's been shown that some of the lifestyle problems are generated by environmental problems, particularly occupational ones. That may be one of the reasons why less educated people are not as likely to stop smoking or to do other things that we would like them to do. Studies by the Social Research Institute in Michigan have found that people on piece work, people on shift work—especially the kind that goes against the body's natural rhythms—are much more often smokers. So I think we have to go beyond lifestyle. We have to consider how people live and this comes down to what you were saying about involving the people themselves. People have to be encouraged to associate some of their environmental problems with their health. The trade-union movement has been rather slow to do this. Their interests are only recently beginning to veer in this direction.

**NAJERA:** What you said about occupation is very interesting. In my opinion, it is the most important thing right now. This is what I mean when I talk of involving the people rather than just giving them health education. Health education implies teaching them about alternative lifestyles as if the educators were imposing responsibilities on the individuals. By doing that, what is most important for people, their working conditions, is being neglected. This is the most important issue for them, and so it should be for us. In my opinion, the lifestyle approach (smoking, cholesterol, etc) shifts attention to less important things. All the efforts made since the 1950s in the area of chronic diseases have, in general, done nothing but shift attention from the big occupational problems that have been there since before the Second World War. Working conditions were improved more between the wars than they have been after the Second World War. It seems as if we have slowed down on this. We talk about cigarette smoking and all that, which would be fine if someone was also paying attention to the problems of occupation, low salaries, etc.

**TERRIS:** I want to dissent very seriously from your line of reasoning. I think it leads to an absolute blind alley. It's a dereliction of duty on the part of the intellectuals, if you'll forgive me for saying this. I've been in a number of socialist countries that emphasize community involvement, and in those countries the workers play an important part in dealing with problems. I'm sorry to say that are also backward in noninfectious disease control. I speak advisedly; I've been there and I know this is true. The reason they are backward is because they still emphasize medical care; they have not yet developed public health. They have not really worked on these issues. They've got all the involvement you want, but they still don't have public health leadership and health education of the public on what the issues really are.

**NAJERA:** But it is not real community involvement. Community involvement means that the community makes decisions and sets priorities for an overall development in which health is one important area. It is easy to talk about this but very difficult to achieve it.

**BUCK:** Just a word before I forget where you're leading us, Terris. You are just making a big leap to the conclusion that in those countries occupational and environmental conditions are O.K. All you have really said is that socialism does not insure an environment conducive to health. I agree. But that does not argue against the importance of the environment.

**TERRIS:** You both imply that the major causes of death and disease are related to occupation. I don't buy that at all.

**BUCK:** Occupation and other environmental factors.

**TERRIS:** The main cause of disease and death in the industrial countries, and increasingly in the developing countries, is heart disease, where we know what the risk factors are, and occupation is not involved.

**BUCK:** You cannot prove that, Terris. You cannot prove that.

**TERRIS:** Yes, I can. It's cigarette smoking, saturated fats, hypertension, lack of exercise.

**BUCK:** Look, we can only predict about half the coronary cases. There is a 50 percent variation in the incidence of coronary disease that we have yet to account for. We can't prove it's occupation. Nor can you deny that it might be.

**TERRIS:** It could be genetic.

**NAJERA:** Also, we don't know which factors in occupation, nor can we quantify their influence. As we were saying, what about work that is not pleasant?

**LLOPIS:** I guess this is the role of epidemiology: to explain how every factor participates in the causation of disease. This is, in part, what papers like the Lalonde Report were saying. These papers attempt to find the best way to apply epidemiology—to define the main areas involved in disease causation and to evaluate the impact of promotion, prevention, and rehabilitation measures on health.

**BUCK:** I think this point takes us back to some of the classic papers that we have selected. The role of epidemiologists, acting as epidemiologists rather than as citizens trying to change policy (because there is an argument about the borderline between the professional's and the citizen's role), will be more important if they study what I will call the "right things." Epidemiologists should not constantly keep their studies within the framework of personal attributes and lifestyles, they should go back to the kind of things that made Cassel's work so influential. Cassel and his group pointed the way towards epidemiological studies of environmental phenomena, cultural phenomena, not just physical things in the environment. This area is greatly neglected in epidemiology, partly because the flow of funds is now very much toward the study of specific risk factors. But I say that epidemiologists, if they want to turn things around while still acting within their profession, should be much more diversified in what they study. In particular, they should be willing to extend themselves into far more powerful and subtle studies of environmental causes of ill health.

**NAJERA:** The role of epidemiology is to understand, in a comprehensive way, what is happening with health. This is my main general criticism of the lifestyles approach. It is a partial approach because it only looks at, say, coronary heart disease, without looking at the web of causation.

**TERRIS:** What do you mean when you say comprehensive? Give me the facts. We have a lot of facts which we can use to dramatically reduce morbidity and mortality and we should move on that. That's the main task of public health at the present time, not just the task of epidemiology.

**NAJERA:** But that approach will only take you so far. Look at us, supposedly highly educated people; we cannot move further because special interests will not allow the shutting down of tobacco factories, tobacco growing fields, dairy farms and industries, and so on. Besides, the majority of the population cannot choose lifestyles. The word style implies the possibility of choice, and choice is not an option for more than 80 percent of the population of the world.

**TERRIS:** If we get enough public support we not only can, we will succeed against special interests.

**BUCK:** I'll just interject one example of where these things belong and they're not as intangible as you allege. Take blood pressure. None of us would disagree about its importance as a risk factor. But there are some occupational observations which suggest that not only the task of the worker but also the milieu of the occupational environment can exert a profound influence on blood pressure and other physiological factors. They're tiny studies and we need more of them. They're not encouraged nearly as much as they should be, I think, partly because of this unbalanced view of causation that you're addressing.

**TERRIS:** We don't have good hypotheses on the causes of hypertension. We really don't. All of the social class studies have been very unproductive. There are very minor differences by social class. The big difference is between whites and blacks, and there are no good hypotheses for why that is so. You say that it's occupational, but you don't have any basis for saying that at all. You have nothing that shows that.

**BUCK:** The reason we don't have any very solid basis is that the research is not sufficiently refined in terms of occupational classification.

**NAJERA:** You were asking why I used the term comprehensive. Comprehensive epidemiological studies take into account every imaginable factor. For instance, consider the health services. We take for granted that our health services are good and we don't look at them as possibly iatrogenic, as factors that may cause disease. Then we start studying, let's say, coronary heart disease, without taking into consideration what the health services are doing with coronary heart disease. We also have to review many of our diagnoses. What is hypertension? Is it a risk factor? Is it a disease? What does hypertension really mean? We have to review

and revise these diagnoses. We cannot have a partial approach; we cannot study hypertension without studying coronary heart disease, or studying stroke, or even diabetes. We must consider the interrelation of those factors so we can understand the web; again the web.

**TERRIS:** What I am proposing is a very specific program since we now have been given powerful tools by the epidemiologists to attack some of the most important plagues of mankind—heart disease, cancer, stroke, injuries, chronic obstructive lung disease, cirrhosis of the liver. These are among the major causes of death and we now have weapons to greatly reduce many of them. To stand by and refuse to put the main emphasis on that, it seems to me, is a dereliction of duty. That doesn't mean that we should not study and act upon the other problems like occupational disease, toxic wastes, the environment. We should. That's another role we should fulfill. But not to attack, at this point, the major causes of illness and death for the benefit of humanity is a dereliction of duty.

**BUCK:** Actually though, the right time to move is when the epidemiological knowledge is solid enough that it deserves to have an effect on public opinion. In the meantime we should be moving on the research front to areas of less certainty but greater potential.

**TERRIS:** We should do that all the time. I'm not objecting to that. What I'm saying is that the main task of public health at the present time is to fight noninfectious disease with the very powerful tools we've been given. I consider health education a part of politics. We now have all sorts of laws in the United States that you would never have believed possible. It really is remarkable that mandatory seat-belt laws and motorcycle helmet laws, laws that infringe on personal liberties, have been passed. We're going to have compulsory labeling of saturated fats, and sooner or later we will have subsidies of unsaturated fats and taxes on saturated fats. There will be all sorts of techniques we will work out to deal with these problems.

**NAJERA:** I think that can be important, but you are talking of the role of public health. We agree that this is part of its role, but we should be talking of the role of epidemiology. Epidemiology is always research, epidemiology is what is next, epidemiology is fundamental.

**TERRIS:** You're not a public health man?

**NAJERA:** Yes, I am, but we are talking of the role of epidemiology—where we should go, how we should study the problems again and again. The application is public health. And it will be real public health if it results from epidemiology, if it is arrived at through the epidemiologic method.

**TERRIS:** The role of epidemiology in health services is to study the best methods for getting the outcomes. In other words, epidemiology must move to become the central feature of health services research. From now on, we should not think of health service research in terms of medical care research, but in terms of public health research.