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Disease Prevention: Asking the Right Questions

The successful scientist, to paraphrase Pasteur, not only asks the right questions but above all avoids asking the wrong ones. An hypothesis must not only be relevant, but also must be answerable.

In public health, the best question is one that can be answered and whose answer can promptly be applied to the reduction of disease. The greater the impact on health, the better the question. Yet, we often focus attention on the uncommon or exotic disease rather than on the more commonly encountered malady. As a case in point, a conference on the issue of vinyl chloride carcinogenesis is likely to get more participation than one on tobacco carcinogenesis. In tumor promotion, more individuals are concerned with phorbol esters than with studying the effect of alcohol, an established tumor promoter in humans. The rare disorder may illuminate the common one, but in the public health context it is not a major end in itself.

Why is it, we should ask, that cardiovascular disease, most cancers, and most chronic diseases occur with such varying incidence in different populations, and why does the incidence tend to change as individuals move from a low- to a high-risk area? The observation pinpoints a role for environmental factors. A number of relatively easily assessed hypotheses emerge, and at the same time practical questions present themselves for answers. For instance, since smoking is so needless a cause of disease, what better techniques are at hand to dissuade children from beginning to smoke? How can we get adults to break their habit? And can we produce less harmful cigarettes? In relation to alcoholism, what can we learn from countries whose public health efforts have reduced alcoholism? In terms of cardiovascular disease, what is an optimal blood lipid level, and what is an optimal intake of fat? What are the roles of nicotine and carbon monoxide in the etiology of myocardial infarction? Would a low-fat diet reduce the risk of breast or colon cancer? Would a dietary intake of less than 5 grams of sodium chloride per day help prevent hypertension and its sequelae? What type of diet allows for optimal physical and mental development of humans without increasing their risk of overnutrition-related diseases? How can we induce people to alter their life-styles in the direction of risk factor reduction and, it is hoped, of improved health and well-being? Clearly, there are many important questions still to be asked, but the ones raised above are among those of special importance to the public health-oriented investigator principally concerned with prevention.

Most scientists prefer to conduct their investigations with a minimal amount of government control or direction. It is commonly suggested that each scientist should be permitted to determine what type of question to ask. But it is necessary to strike a balance, in a society with limited resources, between the academic or mechanistic question and the question immediately relevant to preventive or therapeutic practice.

We suggest that investigators, especially those interested in disease prevention, satisfy themselves that their question is likely to lead to disease reduction. Society continues to suffer from too many diseases that are potentially sensitive to preventive measures. If we are going to overcome such diseases, it is time that, both as individual investigators and as citizens, we ask the right questions. Makers of national science policies should first identify the major questions that could lead to reduction of disease. Such inquiry should then be followed by discussions of how, by whom, and by what mechanisms such questions can be answered.

The answers to one good question usually generate further questions and hypotheses of both pragmatic and theoretical content. Many such cycles are likely before chronic disease morbidity and mortality will be reduced; indeed, the number may be vast. But if we in preventive medicine concentrate on asking the right questions and finding the right answers, we can hope for a stage when the need for further practical answers will be reduced or abolished.—ERNST L. WYNDER, *President, American Health Foundation, New York 10017*