
Public Health in the United States: The Next 100 Years

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THE FOUNDER AND FIRST PRESIDENT of the American Public Health Association, Dr. Stephen Smith, declared at its first annual meeting in 1873 that "the science which we cultivate, and which this Association is organized to promote, discarding the traditions of the past and the teachings of false philosophies, interprets the laws that have been set for the guidance and control of man's earthly existence by the exact demonstrations of a true physiology. This science of life reveals to us the stupendous fact that man is born to health and longevity, that disease is abnormal, and death, except from old age, is accidental, and that both are preventable by human agencies" (1).

This was a statement of faith and a prediction: faith in the liberating power of science and a prediction of its enormous potential for preventing disease and death. The effective use of that potential by public health workers during the past 100 years is unquestionably one of the great and inspiring chapters in the history of mankind.

It is safe to say that in the next 100 years, unless we succeed in blowing up our planet along the way, the changes will be even greater, perhaps exponentially greater, than in the preceding century. A major reason is the scientific and technological revolution; we stand today only on its threshold. Another reason is the evolution of public health, which refuses to stand still. Finally, the whole of society is changing, and this change will profoundly affect public health in myriad ways.

Perhaps the best way to approach these prospects is in terms of C.-E.A. Winslow's definition of public health which, though formulated more than half a century ago, remains to this day the most thoughtful and inclusive (2):

Public health is the science and the art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts for the sanitation

of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing service for the early diagnosis and preventive treatment of disease, and the development of the social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health.

Winslow's definition of public health is unusual on several counts: first, it emphasizes the promotion of health as well as the prevention of disease; second, it is concerned with the preventive values of early diagnosis and treatment; and third, it recognizes the need to develop "the social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health." The five areas of public health listed in his definition provide a comprehensive and logical framework for discussion of the future of public health.

Sanitation of the Environment

During the next 100 years, sanitation of the environment will cease to be a stepchild of public health and become, as it was until recent years, a major activity of health departments. Health departments will be radically reorganized. There will be a Department of Health at the Federal level, responsible for basic national policies and standards for all public health programs, including those concerned with environmental health. Health departments at the State and local levels will be responsible for carrying out national policies and maintaining national standards; their jurisdiction will include all environmental health programs, such as air and water pollution, sewage disposal, milk and food sanitation, radiation, occupational disease and injuries, automotive and other accidents, and drugs, food additives, and other chemicals.

Local health departments will have extraordinary powers. No residential, industrial, or institutional construction will be permitted without prior determination by the health department that it meets approved health and safety standards. These standards will be concerned not only with preventing disease

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and injury but also with positive health—for example, with temperature, noise, and other factors in comfort, efficiency, and well-being.

State and local health departments will have similar powers of approval for the construction of new roads and the improvement of old ones. Indeed, one of their tasks will be to study existing roads to determine the presence of hazards; the health departments will also have the authority to order their abatement. The hazards resulting from errors in the construction of automobiles, trucks, buses, tractors and other farm machinery, airplanes, and other vehicles will be dealt with by the Federal Department of Health in cooperation with State health departments.

Occupational health services, which are only now beginning to come into their own in the United States, will be an important aspect of environmental control by local, State, and Federal health departments. Again, these departments will have the power not only to study and inspect, but also to order the removal of hazards. To provide the scientific basis for these programs, there will be a considerable expansion of research institutes concerned with different aspects of environmental health—institutes that will be constructed by Federal and State health departments in various parts of the country rather than being concentrated in one or two places.

What will be the effects of these organizational and legal changes? Coupled with substantial increases in funds for environmental health, they may be expected to result in almost complete prevention of contamination of water, milk, and food with disease-producing micro-organisms. The technical problems of physical and chemical pollution of air and water will most certainly be solved, as will those of solid waste disposal. Protection against radiation and nuclear energy will be made almost foolproof.

There will be a sharp drop in occupational injuries, and ways will be found to protect workers against known agents of occupational disease. It is the unknown agents that will continue to create problems, as well as the host of new chemicals that will be created for use in industry, medicine, food, clothing,

and housing. Although every effort will be made to devise rapid and effective tests of these chemicals for possible harmful effects, that may not always be possible because of the long “incubation period” before some of the effects appear.

Accidents will be greatly reduced by thorough and continuing attention to the agent, host, and environmental factors involved. One hundred years from now, people will be shocked to find that in 1978 accidents were the fourth leading cause of death in the United States.

The city planners will work closely with their health department colleagues to assure that cities and their rural surroundings are planned for maximum human comfort, efficiency, and well-being. In a hundred years, during which our society will have become fully geared to planning for human needs, slums will have disappeared. Only older buildings of historical interest will have been kept; all others will have been constructed to meet health department specifications with regard to light, ventilation, temperature, noise, and size of rooms. In addition, the rational use of space for dwellings, recreational green belts, and industrial areas will have become a major focus of attention for both city planners and public health workers.

Control of Community Diseases

Writing in 1923, long before the development of epidemiologic research in the noninfectious diseases, Winslow limited the control of disease to community infections. The past 100 years have seen the virtual completion of this first epidemiologic revolution—the conquest of the infectious diseases. Even though the control of a number of these diseases, such as influenza, the common cold, and the venereal diseases, remains elusive, there is every reason to believe that improved scientific tools and control methods will be developed to cope with them.

The second epidemiologic revolution—the control of noninfectious diseases—has already begun. Whether this revolution will also be virtually com-

pleted within 100 years is difficult to say. On the other hand, there is no doubt that major declines in the most significant noninfectious diseases will be achieved. From 50 to 75 percent of the morbidity and mortality from such leading causes of death as coronary heart disease, cancer, cerebrovascular disease, chronic obstructive lung disease, and cirrhosis of the liver will be prevented.

For coronary heart disease, this reduction will be achieved by a shift in the American diet from saturated to unsaturated fats, by effective programs for the detection and treatment of hypertension, and by measures to lessen the prevalence and amount of cigarette smoking. Much cancer will be prevented by environmental control of exposure to specific carcinogens in the workplace and the general environment and by a variety of economic, regulatory, and educational measures to discourage cigarette and alcohol use. A large portion of cerebrovascular disease will be prevented by massive programs for the detection and continued treatment of hypertension. Chronic obstructive lung disease will decrease in direct proportion to the decline in cigarette smoking.

Cirrhosis of the liver will likewise decrease in direct proportion to the decline in alcohol consumption, for there is no reason to believe that we cannot repeat the British experience. Through a policy of increasing taxation, the price of spirits rose in the United Kingdom by 4½ times from 1918 to 1936 (3). In this period, the consumption of spirits declined by two-thirds in England and three-fourths in Scotland. By 1936 the death rate for cirrhosis of the liver was down to 3 per 100,000 as compared with 10 per 100,000 in 1914—a 70 percent decrease. And this lowered mortality rate has been maintained ever since. The death rate in the United States for cirrhosis of the liver now stands at 15 per 100,000, slightly higher than it was in 1914; a reduction equivalent to that of the United Kingdom would bring it down to less than 5 deaths per 100,000.

Diseases with high mortality, such as diabetes and cancers of certain sites, remain, for which current knowledge is inadequate for either prevention or treatment. There are also others that cause a great deal of illness and disability but do not kill, such as arthritis and mental disorders, for which, again, our knowledge is deficient. It is difficult to believe, however, that this situation will remain static. The recent finding that lithium is a preventive agent in manic depressive disease marks an important breakthrough. Sooner or later other breakthroughs will occur as a result of the rapidly increasing tempo of scientific research.

Education in Personal Hygiene

During the latter decades of the past century, health education came to be deemphasized, disparaged, and almost completely disregarded as a tool of public health. In large measure this situation resulted from the efficacy of technical measures such as immunization and environmental control in the prevention of infectious diseases.

Prevention of the noninfectious diseases, however, requires a high degree of understanding and cooperation from the individual. In this era of the second epidemiologic revolution, therefore, health education will again occupy a central rather than a peripheral position in public health practice. Health education will prove essential also because without an informed public, it will be impossible to institute the necessary measures to protect individuals from health hazards in their physical and social environments.

Health education in the next 100 years will be well financed and conducted on a large scale. It will also be highly sophisticated, using all the techniques developed by our modern media. But it will not stop there. For example, health education will no longer be a hit or miss program in the schools, but will become an important aspect of the curriculum, taught by sufficient numbers of well-trained, full-time personnel.

Even more important, health education will assume its rightful place in the curriculum of schools of the health professions because all health workers—physicians, dentists, nurses, social workers, nutritionists, psychologists, and so forth—regardless of their position in the health care system, will be expected to spend a certain amount of their working time in health education. This time will be used, for example, in giving lectures or talks to community organizations, conducting classes for parents or for groups with specific chronic diseases, or preparing written materials. In addition, all health workers engaged in the direct care of patients will be expected to discuss the patients' health problems with them, give them advice and counsel, and teach them how to promote health and prevent disease.

In so doing, health workers will be heeding the conclusions of an important, but curiously disregarded, study that appeared in *Public Health Reports* many years ago (4). Comparing medical groups that had different levels of hospital training after graduation, the Public Health Service found, as expected, a positive correlation between length of hospital training and diagnostic thoroughness: the groups with the most hospital training performed more general, more rectal, and more X-ray examinations. Far

more interesting, however, was the finding that the groups with the least hospital training had a greater tendency to prescribe sedatives or stimulants, topical applications, vitamins, hormones, and cathartics. On the other hand, the groups with the most hospital training were more likely to recommend bed rest or exercise or to give advice relating to diet.

The implications are clear enough. The more highly trained physicians rely less on drugs and more on giving patients advice, counsel, and education about procedures affecting health. Improvement in the quality of health care will mean a weakening of physicians' overdependence on drugs—their drug culture, so to speak—and a strengthening of the patient-physician relationship through discussion, advice, and health education. The next 100 years will undoubtedly see great strides in this direction.

Personal Health Services

After a distressing period of experimentation with private and governmental health insurance—in which bureaucracy will increase as a result of vain attempts to contain costs, and inequities in health service will continue—the United States will establish a National Health Service.

This National Health Service will have three major components: research, disease prevention, and personal health services (health care). The research component will be comprised of the National Institutes of Health, including new Institutes that will have been set up in different parts of the country. Disease prevention will include all programs for the prevention and control of infectious and noninfectious diseases and trauma. In accordance with the policy of recognizing the primacy of prevention, this component will receive a great deal of budgetary and organizational emphasis.

The health care component will serve the entire population, except for a small proportion of people who prefer to use private physicians, and even this small proportion will have dwindled to practically zero by the end of the 100-year period.

Services will be comprehensive, including mental, dental, and long-term care. There will be no payments by patients for any of the services. These will be provided in community health centers and hospitals staffed by salaried physicians and other salaried health workers. Furthermore, the National Health Service will make possible the establishment of a national network of medical institutions. The dream of regionalization, so remarkably well conceived by Dr. Joseph W. Mountin and his colleagues in the Public Health Service in the 1940s (5,6), will now be

realized. In accordance with patients' needs, they will be referred from small hospitals to larger and more specialized institutions, and eventually if necessary to university medical centers. Health personnel, also, will move in this direction for postgraduate education at the complete expense of the National Health Service. In the other direction, personnel from the university medical centers and the more specialized institutions will visit the smaller hospitals to provide consultation and education.

State and local health departments will be part of the National Health Service, responsible to it in the area of overall policy and standards, but responsible to their respective State and local governments for the effectiveness of the services provided. Like the National Health Service, the State health departments will maintain the three basic components of research, disease prevention, and health care; local health departments will usually be concerned only with disease prevention and health care.

The bureaucratic morass resulting from a plethora of specialized and fragmentary health programs and the enormous paperwork involved in fee-for-service payment for health services will disappear. The Federal health establishment will actually shrink after the National Health Service is established, since it will be concerned primarily with the development of policy; implementation will occur primarily at the local level and secondarily at the State level for regional coordination.

There will be increasingly democratic control of health services. All health departments and institutions will be responsible to boards or councils representing all sections of the population. This situation will be in sharp contrast to the present one, in which relatively small sections of the population dominate the boards of hospitals, health departments, and voluntary health agencies.

Perhaps even more important, the public will be drawn into the work of health departments on a scale far greater than in the past. This involvement will be particularly common in programs for the prevention of infectious and noninfectious diseases and trauma, but will also be common in health care. Community organizations and individual volunteers will play an important role in providing assistance to health personnel in health education, immunization campaigns, environmental health, occupational health and safety, mass screening, and first aid. Such participation will not only strengthen health programs, but will give the public a much greater understanding of the needs and problems of the health services.

The content of medical services will change. It is unwarranted to describe current medical services as "health care;" what we now provide is, for the most part, diagnosis and treatment. With the exception of pediatrics and obstetrics, little emphasis is put on the promotion of health and the prevention of disease. Yet Winslow, in his definition of public health, not only defines "promoting physical health and efficiency" as a basic objective, but includes medical care in a specific conceptual framework, namely "the organization of medical and nursing service for the early diagnosis and preventive treatment of disease."

The National Health Service will be oriented toward health promotion as well as toward the early diagnosis and preventive treatment of disease. In the health promotion area, the physicians, nurses, and other health personnel will be particularly concerned with the growth and development of children. They will want to assure that both children and adults have the adequate diets, sufficient sleep, rest and recreation, and optimal exercise that will not only help prevent illness but will result in positive health, that is, vigor, energy, and vitality.

Early diagnosis and preventive treatment will be extended through automated multiphasic screening methods to the entire population. They will be extended also beyond disease detection to include the detection of risk factors such as elevated serum cholesterol. Followup will be intensive in order to assure that the needed treatment is instituted.

Preventive supervision of pregnant women, infants, children, workers in hazardous occupations, and people with chronic diseases will become an accepted part of the health services. Every attempt will be made, including home visits when necessary, to have people remain under appropriate supervision and care. The health services, furthermore, will not only have the authority to prescribe the environmental changes needed to protect the patient's health—including job transfers and changes in living quarters—but will also have the authority to get the prescription filled by the responsible agency.

An Adequate Standard of Living

Winslow saw clearly the close relationship between poverty and disease (7), and it is not surprising therefore that he included in his definition of public health "the development of the social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health."

Poverty and its too-constant partner, discrimination, are responsible for a great deal of unnecessary

disease. They are also at the root of much of the violence that threatens all classes of the population in our cities. Just as cholera in the 19th century moved out of the hovels of the poor to reach into the homes of the well-to-do, so violence today moves out of the slums and the ghettos to make entire cities unsafe.

From a public health viewpoint, therefore, and from every other point of view, it will become necessary for society to bring an end to unemployment, poverty, and discrimination, and to assure satisfactory pensions for the retired instead of the current crazy quilt of inadequate programs. That these changes will be accomplished in the next 100 years, there can be no doubt. As with all significant social changes, however, we must be concerned that they be consummated with as little travail as is humanly possible.

Once these changes occur, the way will be open for an unprecedented advance in the health of the public. Together with effective control of environmental hazards, large-scale programs against noninfectious diseases and trauma, intensive and extensive use of health education, rational organization of medical services and the transformation of these services into health care, and future discoveries that we may confidently expect as a result of the burgeoning scientific and technological revolution, these economic and social changes will make it possible in the next 100 years for the United States to eclipse completely its remarkable record of the past century in lowering human morbidity and mortality. We stand at the threshold of a great new era of public health. It is our task and our privilege to unlock the door and open it wide to the future.

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