THE MANPOWER PREDICAMENT IN ENVIRONMENTAL HEALTH

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Few people would dispute that the quality of the environment is deteriorating and that corrective action requires an effective system of communications among professionals and laymen; a sound management of our available resources and strong leadership at all levels of community interest and concern.

Traditionally, our way of dealing with environmental hazards to man’s health and welfare has been one of reaction to crisis. When environmental hazards became apparent, elements of our society reacted to eliminate or control such hazards or merely to live with them. This pattern of environmental protection has fallen short of its purpose, and may well be the gut issue that can unify or polarize this nation in the 1970’s.

A fundamental new approach is needed: one based on the idea that man’s health and welfare ought to be regarded as nature’s last, not the first, stress signal of an environmental health hazard.

This approach to environmental health must be based on a new view of the relationship of man’s health to his environment—namely, that human illness can be a symptom of environmental stress and that environmental health efforts must treat or prevent the disease itself, not the symptoms.

Obviously, we cannot pursue this approach in a vacuum and our capabilities to deal with environmental problems effectively and realistically depend upon a broad spectrum of resources and what we do in other areas where we face comparable crises and challenges.

In the field of environmental health, as in any human endeavor, the success in achieving stated goals is closely related to the quality of manpower brought to bear therein. The effectiveness of national, state, and local programs in environmental management depends, in no small measure, on the availability of competent personnel in sufficient numbers to meet the task we face today. So it is in this general setting that I wish to sketch in fairly broad strokes the predicament of environmental health manpower.

MANPOWER SUPPLY IS CRITICAL.

Although the problem of manpower has been developing for a number of years, it is only recently that these issues have begun to take definite directions. The current supply of environmental control manpower both in engineering and the sciences, is at a critical stage. Since 1960, study after study and report after report, tell the same story of continuing vacancies in the areas of applied research and development, teaching, and in the field application of knowledge for the prevention and control of environmental hazards to health. A recent survey by the Public Health Service recognized approximately 38,000 persons employed in environmental control, an estimate based on 9,000 engineers, 15,000 sanitary scientists and supporting technicians, and approximately 12,000 environmental program specialists.

Water pollution programs

Water pollution abatement programs are in serious trouble not necessarily because of inadequate funds and technology, but deficiencies in manpower. In 1967 about 3,600 scientists and related professionally trained people were employed in water pollution control programs. Currently there is an urgent need to increase that number by more than 150% without any consideration of replacement. In Boston, operation of the Deer Island waste water treatment plant, after construction, was delayed for several months merely because adequately trained operators were unavailable. Today, St. Louis needs approximately 110 operators at its new metropolitan treatment plant which will become fully operational late this year. At the last count there were approximately 20,000 operators of waste water treatment plants; within the next two years 35,000 will be needed to help clean up our nation’s streams.

In the field of sanitary engineering there is currently an annual need for 116 additional professionals to promote and protect public health through design, operation and management of facilities that control and improve man’s environment.

The manpower situation in water resources is further illustrated by the recent experience of the Wa-
ter Resources Council (WRC), a federal interdepartmental agency which makes grants to states to assist in developing comprehensive water plans. In fiscal 1968 WRC disbursed 2.2 billion dollars to 49 states. Indiana alone did not participate. That State reported to the Council it did not want money because it had so many unfilled positions already that it would be pointless to take more money to create more jobs it cannot fill. Similarly, many other states, Puerto Rico, and the Virgin Islands are experiencing recruitment difficulties in water pollution control programs.

Air pollution programs

In the field of air pollution, the situation is not much better. In 1961 state agencies employed approximately 148 full-time and 30 part-time personnel. Today, several thousand vacancies exist because of shortage of qualified personnel. This shortage will certainly get worse. Already 1900 new positions have been created by abatement programs now being supported by the National Air Pollution Administration.

The manpower needs of industrial plants and engineering firms for air pollution control personnel push the situation beyond the serious to the critical stage.

Solid waste management

The rising national concern about solid waste adds another dimension to the environmental health manpower problem. Similar to other environmental areas, solid waste is plagued by a lack of adequately trained personnel to help develop new concepts in solid waste technology and management. The need for more refined solid waste technology and qualified personnel is brought into sharper focus when it is realized that 75% of all solid waste ends up in open dumps with the associated health hazards: flies, rats, and other vermin.

Local health services

In traditional local environmental health services as provided by local departments of public health, the level of qualified manpower is not, and never has been, commensurate with new responsibilities resulting from advances in technology and population growth. The approximately 17,000 public health sanitarians and sanitarian technicians can hardly be expected to deal effectively with problems of institutional hygiene, milk and food protection, housing hygiene, accidental injury control, land-use planning, and general community sanitation.

In addition, the expanding role of hospitals and related medical care institutions has generated the need for specialists in the field of institutional environmental control, with major concern for the health and safety of both patients and staff. The control of the physical environment in medical care facilities requires a specialist with more than the usual training in basic community sanitation. This responsibility calls for training in environmental microbiology, radiological health, epidemiology, disinfection and sterilization techniques, as well as general aspects of hospital administration. A cursory review of the “employment service section” of monthly health-oriented journals would indicate that such persons are in extremely short supply.

Any official health agency operating in today’s industrial age that intends to give equal service to all citizens who support it should in theory have an occupational health and industrial hygiene program. Yet the most recent estimates available indicate that less than 3,000 industrial hygienists are employed in the United States. Most of them work in an industrial setting, in transportation or utility companies. The 50 states, Puerto Rico, and the District of Columbia employ less than 1,800 occupational safety inspectors. New York, California, and Pennsylvania account for more than 700, whereas Massachusetts, Mississippi, Nevada, New Hampshire, New Mexico, and North Dakota have an even smaller number of personnel with responsibility for on-the-job safety.

Ecology

Moving from the narrow concern of environmental health services administration to the broader concept of the total environment, I believe that many of the urgent problems facing and threatening mankind can be defined as an ecological crisis—a breakdown in the environmental system which governs the quality of life. Accordingly we must begin to recognize the promise that ecological considerations offers both for the prediction of and solution to environmental problems. Despite these promises however, the science of ecology also suffers, as do other environmental quality issues, from lack of manpower.

LaMont C. Cole, the distinguished Cornell ecologist, recently expressed concern that not enough scientists are being trained to implement the ecological programs that will be recognized as necessary in the near future. According to the National Register, only 1,300 biologists are identified as ecologists and less than 800 are being graduated each year from colleges and universities.

Why The Predicament?

At this point, one may logically ask: are there identifiable reasons for the manpower predicament of environmental health? There are some central issues that seem to be clearly identifiable.
Inadequate opportunity

In less affluent state and local areas, the quality of the program is frequently not a sufficiently challenging opportunity for professional career development. Potential candidates for employment soon lose interest in a system which limits opportunity for promotion to the top. The opportunity to advance, to conduct research, to participate in shaping of programs, and to tackle difficult problems is a necessary component of career development and job satisfaction. Undoubtedly, inadequate salaries make it difficult, if not impossible, to compete with private industry or services. For example, a person suitable for training in industrial hygiene should have a B.S. degree and, preferably, an M.S. degree in chemistry, engineering, physics, or biological science. The prevailing salary outside governmental agencies for such personnel is so much higher than that established in most health departments, that it is nearly impossible to hire well-trained personnel or to retain inductees after they have gained experience in the industrial hygiene field. It is a tragedy that one of the most serious obstacles to the recruitment and retention of environmental health personnel lies in our civil service system, originally designed to assure leadership of high quality based on merit rather than political affiliation. These systems not infrequently have, with some justification, been accused of perpetuating mediocrity. Rigid seniority requirements for promotion have tended to discourage those with greatest leadership potential and they have sought other outlets for their superior ability, leaving the less talented and therefore less sought after, in positions of responsibility. One occasionally hears a long-time civil servant explain his rise to a high position by the comment “I never bothered anybody, or I never rocked the boat, and nobody bothered me.” Promotion was inevitable, given enough time.

Fragmentation of health services

Probably one of the most important factors has been the tendency to fragment health services through creation of competing agencies resulting in a situation in which strong state or local leadership was inhibited. One need only look at the national level for examples of fragmentation and duplication which have resulted in underutilization of environmental health manpower. No less than 13 congressional committees have a “piece of the environmental health action.” In addition, there are 90 separate federal environmental programs plus 26 quasi-governmental bodies and 14 interagency committees at work on aspects of the environment. Such an arrangement creates waste and inefficient use of manpower in the form of red tape, duplication, and conflicting goals. Moreover, the federal government through its grant program, has created and financed “islands of excellence” in universities and industry in those very scientific and engineering aspects of health that heretofore had been the responsibility of the Public Health Service (PHS). Thus, expertise outside the Public Health Service has developed and now competes with the PHS as well as state and local health agencies for trained personnel who are in short supply.

The Public Health Service

Allow me to comment on another development at the national level which impinges on the total environmental manpower problem. From its inception in 1789, the Public Health Service has provided leadership for meeting health problems in this country in areas or situations where there were otherwise inadequate or absent resources. However, since 1960, major reorganizational changes have taken place which have altered the status, role, and authority of the Surgeon General and the Commissioned Corps of career health professionals. These changes have created confusion and uncertainty as to the leadership role or responsibility of PHS for national health affairs that it has had in the past. As a result, a considerable number of experienced environmental health specialists of the professional Commissioned Corps have left and are leaving the Public Health Service. The remainder are somewhat disturbed and uncertain as to their own future as well as that of the Commissioned Corps. The effects of these developments on the total environmental manpower pool at all levels of government are fairly obvious.

If state and local health agencies are to serve on the firing lines for a vigorous program of environmental health, much of their immediate support must come from the national level where trained specialists must be available to provide assistance and to identify special problems. Indeed this technical assistance is very important to state and local environmental health administrators who continuously lack trained personnel and an adequate budget.

Racial discrimination

No paper, no discussion, no argument on the question of health manpower shortage can proceed very far without considering the impact of racial discrimination on the present predicament of environmental health manpower. The “quota system” is still used, sometimes in subtle form, to exclude minority groups from many of the health training institutions. Non-relevant admission qualifications and credential barriers coupled with the bleak prospects for advancement, have served to limit the number and quality of minority group members who seek preparation and
careers in environmental health science and engineering.

Terence Carroll, Director of the National Institutes on Rehabilitation and Health Services, recently corroborated this view in a published letter to the editor of the American Journal of Public Health. His conclusions are worth repeating here:

"Related to the matter of segregated health facilities was the failure of the (U.S.) Public Health Service over the years to stress the need for an expansion of training programs for health personnel and the admission of students to those programs without regard to race or religion."

"The quota system which was used as an admission policy by nearly every medical school for decades, and the outright exclusion of blacks from many of the institutions that provide training in the health disciplines, has contributed substantially to the present scarcity of health manpower."

There can be no question that minority groups have long been under-represented in the "providers" segment of community health services, and this imbalance also has had a severe impact on the provision for total environmental protection as well as personal health services. All too many non-minority-group "providers" of health services are not sufficiently attuned to the needs of minority groups. The narrow concepts of these health workers and their insufficient dedication to those "across-the-tracks" have helped sustain the black-white morbidity and mortality disparity, the high level of rat infestation in the inner city, the substandard housing which still plagues the urban environment, and the low quality of foods offered for sale to the minority-group consumer in the urban ghetto.

It is encouraging to note that the American Public Health Association recognized the gravity of the situation and adopted a resolution last year at its Annual Meeting in Philadelphia, calling for "Equal Rights in Health Manpower." Toward this end, the association will join a national effort to prepare a health manpower policy for equal rights. I sincerely hope that these guidelines will not be just another publication in the archives of the Association.

Discrimination based on sex

Barriers to recruitment based on sex also have had their effects on the manpower problem. Women constitute an important resource for skilled environmental health manpower. Although the majority of health workers are women, they tend to be employed in lower level jobs and at a lower salary than men. There seems to be a prevailing view that there is something unfeminine about environmental health practice. Perhaps this has been generated by the aspiration and conviction of the engineer-health official that he should be the natural leader of the environmental health team. I am sure that in some regards this is very sound.

As I see the field of environmental health developing there are many areas where others who are neither male nor engineer are likely to be more competent. A basic unresolved issue is how to assure at the helm, the best qualified professional, regardless of race or sex.

Sex, racial, and ethnic heritage have no place in our society as barriers to effective recruitment of health manpower and time is slowly running out for those who would perpetuate such a system.

Imbalance in priorities

Another dimension of the real issue centers on the question of our enormous, indeed outrageous, imbalance in our national effort and in our national priorities.

Last year we spent approximately $8 billion dollars on research and development for military weapons and on the space program. Interestingly enough, some of this so called defense research had no foreseeable military application. What did we spend in applied research in air pollution, waste water treatment, solid waste disposal, urban development, traffic and noise? I suppose approximately 100 to 115 million dollars.

Is it any wonder that with this kind of an imbalance, with this kind of distortion of national effort that the scientific and engineering manpower is marshalled where the money is. Thus, in recent years we have seen an increasing number of doctoral degrees awarded to students who had their sights on top research assignments in the aerospace or defense related research programs. To pursue that direction was not only human nature, it was the most natural thing to do.

Failure to redefine goals in health professions

The health profession itself also has failed to redefine its goals and to shift the resources required to meet these goals. This unquestionably implies an unsatisfactory articulation with education and training of manpower. It seems highly questionable that because physicians were asked to head up many fields of public health when communicable diseases had a priority role, that this pattern should hold when such problems as urban development, housing hygiene and safety, noise, air and water pollution, solid waste management, and other developments which are far removed from the medical curriculum, are high on the list. Our failure to rethink staffing requirements pursuant to a shifting of goals has unfortunately helped to perpetuate the present health manpower...
stringency. Another contributing factor is the lack of coordination horizontally and vertically in the field of environmental health. It makes little or no sense for the environmental health specialist not to be associated with other professionals engaged in seeking solutions to current man-environment problems. Individually, each is likely to have very little influence, as we have seen in the past. Collectively, there is the strong possibility that they might be able to effect positive changes. We environmentalists need allies and must make formal alliances with urban planners, housing experts, lawmakers, conservationists, consumer groups, and related disciplines. Dr. Harlan Cleveland put it this way:

"—nowadays, significant decisions are hardly ever made by individuals but instead by a complicated process of brokerage and bargaining, of committee work and consensus. And so the expert at whatever level has the obligation not only to be right, but also to be an effective salesman and organizers who can mobilize the work of others around his own perceptions."

We environmentalists need to be able to mobilize the work of others around our own perceptions in an effort to complement existing manpower. In some activities related to environmental health, we will be in charge; in others we will be a member of a leadership team—sometimes a dominant member, sometime subordinate.

**IN CONCLUSION**

In conclusion, you have heard many persons attempt to offer a panacea for the kind of problem which I have discussed in this paper. My experience in academic teaching and research and more recently as administrator of an urban environmental health program would indicate that there is no single solution which can be applied across the board.

I do not believe that the answer lies solely, or even primarily, in opening up a large number of new positions with new titles and subtitles related to new technics and new functions that emanate from new technologies. Rather I suspect that we face a more serious challenge of reassessing our goals, re-evaluating our resources, and realigning our methods in a broad systems approach.

Unquestionably, environmental health is an exciting field and full of unprecedented challenges. As such, it should be able to attract a reasonable proportion of able people. We can only achieve this goal through appropriate concern for and action on those factors which continue to frustrate our best effort to resolve the manpower predicament in environmental health.