

**THE EVOLVING NATURE OF ENVIRONMENTAL HEALTH AND  
PROTECTION**

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**My presentation today is offered from the viewpoint of a practitioner rather than an academician, as I have spent most of my career as a practitioner struggling with public health issues.**

**You will note that I generally use the term "environmental health and protection," rather than environmental health, or environmental protection. I do this because all environmental health and protection programs share a public health goal and are usually based on public health standards. The differences are in their artificial organizational settings. For peculiar territorial reasons, some people term the programs environmental health if they are the responsibility of an agency called a health department, and environmental protection if they are not the responsibility of a health department. We should be building and traveling bridges between all the various agencies involved instead of creating terminology and turf barriers.**

**Concern for the quality of our environment and related public health implications has never been more intense. Political leaders and ordinary citizens, whether liberal, moderate or conservative, express concern over the quality of our environment.**

**But there is widespread disagreement regarding environmental health and protection priorities, acceptable risk, and organizational issues.**

**When I first entered the field in 1950 at \$225.00 per month as a county sanitarian, the field, the priorities and organizational settings were much better defined, but much narrower and less complex. The terms "environmental health" or "environmental protection" were not commonly used. Within a few years after becoming engaged in public health, I began having serious concerns regarding the traditional textbook pattern of organization and delivery of environmental health services at the state and local levels. Had I been the only person having such concerns, I would probably have eventually become frustrated and moved into a different career track. But I found that many of my most respected peers were asking similar questions. I recall useful discussions with individuals whom I considered to be the nation's environmental health "giants" in various schools of public health, and in state and local health departments, and in the U.S. Public Health Service. Communicating and visiting with such leaders was invaluable in helping me to refine my evolving concepts regarding the future of environmental health at that time.**

**At this time, several recent national documents which have had some impact on the future of environmental health and protection, as well as relationships with the rest of the public health community. The Institute of Medicine Report on the Future of Public Health provides thoughtful material which should be studied critically by every public and environmental health and protection professional. The emphasis of the report is on personal health, health care, and relationships to the medical community with occasional, though significant reference to the importance of environmental health. Environmental health and protection agencies outside health departments were not visited or included in**

the IOM study. By relying on inadequate data provided by the Public Health Foundation, the IOM report contributes to the misunderstanding of, and inadequate emphasis on, environmental health and protection by the public health community as well as community and political leaders.

The IOM document does not provide adequate consideration of the complexity and magnitude of environmental problems facing our nation and the world. Only two of the 22 Committee members were well-known environmental health and protection experts. I do not find that consultation was developed with any of the various national environmental health and protection associations. The IOM Report discusses the important issue of effective relationships with the medical care profession, but is silent on equally essential relationships with planning agencies, transportation authorities, environmental groups, agricultural groups, engineering societies, developers, manufacturers, educators, and economic development officials with whom environmental health and protection programs must network and coordinate.

Healthy People 2000: Disease Prevention and Health Promotion Objectives for the Nation, developed by the U.S. Public Health Service, is another important national report. The first draft of the environmental health component was not only dismal, but counterproductive to the cause of environmental health and protection. There were glaring inadequacies and errors pertaining to professional education, air quality, and hazardous wastes. And a list of the issues ignored in the original draft was, at the same time, a list of many of the priority areas in environmental health and protection. Those issues ignored included: solid waste management, water supply, water pollution, noise

**pollution, food protection, radiation protection, vector control, institutional and recreational environmental health; as well as the environmental health aspects of energy production, transportation systems, land-use, and resource consumption. And finally, the draft did not include such global environmental health and protection issues as possible global warming and stratospheric ozone depletion, desertification, deforestation, planetary toxification, and overpopulation.**

**On behalf of the American Public Health Association Section on Environment, I developed and transmitted a critique regarding specific environmental health and protection inadequacies in the draft Year 2000 Report to the U.S. Public Health Service Office of Disease Prevention and Health promotion, and had a number of discussions with personnel in that Office. I was pleased with their timely and positive reaction. The environmental health chapter was entirely revised and changes were made that addressed many of my concerns. The environmental health objectives in the final document are certainly not perfect, but they are much improved while still lacking in comprehensiveness.**

**Some of us thought we had made our point regarding the Year 2000 document prior to the follow-up USPHS conference designed to publicly release the final recommendations. However, the conference provided an instructive case study regarding top level Public Health Service attitudes regarding environmental health and protection. Specifically:**

- There was no workshop on environmental health and protection.**
- There was no program participant charged with discussing environmental health and protection.**
- I did not identify any participant from EPA, the nation's leading environmental health and protection agency.**

- Few of the speakers even mentioned public health or environmental health and protection, but chose to discuss "health care." Environmental health and protection does not identify with health care, the one-on-one treatment or rehabilitation of a patient.
- A film was shown which purported to depict health status in the Year 2000, but not a frame or word thereof was devoted to air, water, wastes, food protection or other environmental health and protection issues.
- I had called four of the major program participants prior to the conference requesting that they provide some balance, some indication of support, interest, or even recognition of the environmental health objectives. None of them even mentioned the environmental health objectives.

Perhaps the most significant environmental health experience at the conference was the invited EPA band. And that only served to remind me of the title of the book And The Band Played On.

And then another instructive episode occurred following adoption and distribution of the Year 2000 Objectives. The USPHS developed a draft of criteria for selected health status indicators to be used by federal, state, and local health agencies. This was an eight page document which may have been useful for disease prevention, health promotion, and health care. However, the PHS had again essentially ignored environmental health, environmental quality, environmental standards, environmental regulations, air quality, water pollution, water supply, food protection, solid wastes, hazardous wastes, toxic chemicals, occupational health and safety, noise pollution, radiation, environmental health and protection personnel, environmental health and protection laboratories, and global environmental problems.

Once again, I responded to this draft on behalf of the APHA Section on Environment requesting inclusion of the previously mentioned issues.

To make a long story short, here's the rest of the story. The criteria were finalized and published and did not include any of our recommendations. It is as if some components of the U.S. Public Health Service don't know or care that the environment exists!

Another episode occurred more recently when I developed and transmitted several pages of detailed recommendations to the Council on Education for Public Health so that environmental health and protection education would be improved and emphasized in accredited schools of public health. Thus far, these appear to have been recommendations whose time has not come.

The interest, understanding and emphasis accorded environmental health and protection by many current national public health leaders and groups reminds me of a statement frequently made regarding legislators by one of the Governors for whom I worked. He said, "*Blessed are those who expect little, for they shall not be disappointed.*"

But despite these horror stories, the future of environmental health and protection is bright for those professionals who have the necessary knowledge, skills, demonstrated leadership ability, and understand and participate in the environmental changes which will continue to take place. Those who are inflexible and rely on past accomplishments, the status quo, and organizational turf will be numbered among extinct species.

**RISK AND PRIORITIES**

**Environmental health and protection continues to be a matter of local, national and global discussion and debate. Globally, priority issues include species extinction, possible global warming and stratospheric ozone depletion, wastes, desertification, deforestation, planetary toxification and, most importantly, overpopulation. Excessive population contributes to all the foregoing as well as to famine, war, disease, social disruptions, economic woes, and resource and energy shortages.**

**A 1990 Roper poll found that, in terms of public perception, at least 20% of the public considered hazardous waste sites to be the most significant environmental issue. But contrary to public perception, the 1990 report of the Environmental Protection Agency's prestigious Science Advisory Board lists ambient air pollutants, worker exposure to chemicals, indoor air pollution and drinking water pollutants as the major risks to human health. EPA's REDUCING RISK also states that:**

*"...there is no doubt that over time the quality of human life declines as the quality of natural ecosystems declines.... over the past 20 years and especially over the past decade, EPA has paid too little attention to natural ecosystems.*

*The Agency has considered the protection of public health to be its primary mission, and it has been less concerned about risks posed to ecosystems .... EPA's response to human health risks as compared to ecological risks is inappropriate because, in the real world, there is little distinction between the two. Over the long term, ecological degradation either directly or indirectly degrades human health and the economy .... human health and welfare ultimately rely upon the life support systems and natural resources provided by healthy ecosystems. "*

As risks to the natural ecology and human welfare, Reducing Risk listed habitat alteration and destruction; species extinction and overall loss of biological diversity; stratospheric ozone depletion; global climate change; herbicides/pesticides; toxics, nutrients, biochemical oxygen demand and turbidity in surface waters; acid deposition and airborne toxics. Among relatively low risks to the natural ecology and human welfare, the list also included oil spills, groundwater pollution, radionuclides, acid runoff to surface waters, and thermal pollution.

A December 1991 survey conducted by the Institute for Regulatory Policy of nearly 1300 health professionals indicated that:

*"Over eighty-one percent (81 %) of the professionals surveyed believe that public health dollars for reduction of environmental health risks in the United States are improperly targeted. "*

Taking all of this into consideration, it must be emphasized that risk assessment and risk communication are among the most critical environmental issues of today and tomorrow. While resources should be allocated to address actual and significant risks, public perception drives the response of elected officials and public agencies.

Environmental health and protection practitioners usually have greater expertise in dealing with technical program issues than they do in the realm of risk assessment, risk communication, epidemiology, prioritization, fiscal impacts, agency management, and public policy.

As public health practitioners:

- **We should understand the role of science in determining public policy, place a high value on scientific excellence when developing public policy, and recognize the misuse or absence of science in an effort to justify a position or alarm the public.**
- **We should recognize that some of the media are frequently a conduit for an abundance of misinformation and a shortage of critical scientific inquiry behind many of the "catastrophe -of-the-week" issues.**
- **We should recognize that if all the alleged environmental catastrophes were scientifically factual, we would have many times the actual morbidity and mortality rates.**
- **We should refute stories which are not based on sound epidemiology, toxicology and risk assessment.**
- **We should question reports which base a problem on finding one anecdotal example, e.g., one cancer patient near a hazardous waste site, that capitalizes on appeal to the emotions.**
- **We should beware of individuals and organizations who purport to use "science" to front and further their organizational and political objectives.**
- **We should recognize that peer-reviewed science does not depend on media manipulation, Hollywood personalities, or slick public relations.**
- **We should beware of "predicted" morbidity and mortality figures pulled out of the air by self-styled "experts".**
- **We should be scientifically critical. Too many practitioners are actually only regulators and functionaries, ever ready to accept, promote and enforce the current party line or misinformation.**
- **We should recognize the difference between science based facts and public perception.**

- **We should learn and practice the art of risk communication. Few environmental health and protection professionals understand and practice effective risk communication.**

**Instead, risk communication is erroneously considered to be a speech, a press release, a letter or a leaflet. This is one of the reasons that public perception of risk is at variance with that of scientists.**

- **We should always question, challenge, investigate alternative solutions, and analyze existing and proposed regulations and standards to determine the validity of their scientific base. Existing programs, standards and regulations tend to be magical and take on lives of their own. They are seldom challenged. A standard in motion tends to remain in motion in a straight line unless impeded by an equal and opposite force. Environmental health and protection professionals should provide the scientific "equal and opposite force" to challenge the prevailing understanding of risk when necessary.**

- **We should remember that people tend to overestimate risk from rare but dramatic events, and tend to underestimate common events such as unintentional injuries and deaths, and the slow homicide and suicide caused by tobacco. People disdain changing preconceived notions about risks and priorities, and people are quick to dismiss evidence as erroneous or biased if the information contradicts their preconceived opinions.**

- **We should understand that many Americans, and even some public health practitioners, seem to exhibit a love of calamity. Some extremists are applauded and profit from false predictions of environmental calamity, some of which becomes translated into public hysteria and public perception, thence into political action, and finally into expensive and unnecessary programs and public policy. Those promoting such hysteria accept no responsibility for their false statements and predictions.**

- We should define problems before proposing solutions, and fit the solutions to the problems rather than the problems to the solutions. Some groups seem to consistently have canned solutions waiting for problems.
- We should realize that the proper standard for environmental health and protection is not always "zero-risk", but "net benefit", or "net impact." Zero-risk may not be economically or practically attainable, and the cost of pursuing zero-risk for one issue may preclude resources essential for addressing more important problems and, also leads to unrealistic public expectations.
- We should understand that an unnecessary or poorly designed or overly expensive program becomes even more difficult to stop or alter once a bureaucracy or an industry is developed to promote the program.
- We should develop improved methods to prevent environmental problems, as differed from curative efforts and clean-up. While the field of environmental health and protection identifies with prevention, a preponderance of effort is devoted to solving problems created as a result of earlier decisions and actions taken by the public or private sectors. Therefore, public health personnel must become effectively involved in the planning and design stages of energy production and alternatives, land use, transportation methodologies, facilities construction, and resource utilization; as well as design, development and production of products which may adversely impact human health or delicate ecological balances. Environmental policy must be based on prevention if there is to be any hope of preventing further resource depletion, ecological destruction, and minimizing the health impacts of environmental contaminants.

**And finally:**

- **We should be wary of accepting problems based only on extrapolations and correlation rather than on good epidemiological and toxicological cause-and-effect studies.**

**If we consider correlation only, we would probably conclude that: CARROTS WILL KILL YOU! After all,**

- **Nearly all sick people have eaten carrots. Obviously the toxic effects are cumulative.**

- **An estimated 99.9% of all people who die from cancer have eaten carrots.**

- **99.9% of people involved in auto accidents ate carrots within 30 days prior to the accident.**

- **Some 93.1 % of juvenile delinquents come from homes where carrots are served frequently.**

- **Among people born in 1879 who later ingested carrots, there has been a 100% mortality.**

- **All carrot eaters born between 1900 and 1910 have wrinkled skin, have lost most of their teeth, and have brittle bones and failing eyesight, if the ills of eating carrots have not already caused their deaths.**

**Additionally, keep in mind that: STORKS BRING BABIES!**

**The number of storks in Europe has been decreasing for decades. Concurrently, the European birth rate has also been declining.**

**Obviously, we would be foolish to accept correlation as evidence that storks bring babies or carrots cause illness and death.**

**The science of epidemiology attempts to sort out from myriad chance correlation those meaningful ones which might involve cause and effect. However, we all know that epidemiological methods are inherently difficult, that it is not easy to obtain convincing evidence, and that there are many sources of bias.**

## **ORGANIZATIONS**

**There are many agencies which administer environmental health and protection programs at all levels of government, and there is no standard organizational model for environmental health and protection. Every level of government has numerous agencies with environmental health and protection responsibilities.**

**At the federal level, these agencies include the Environmental Protection Agency, the Occupational Safety and Health Administration, the U.S. Public Health Service (including the National Institute of Environmental Health Sciences, the Centers for Disease Control, the Indian Health Service, the Food and Drug Administration, the Agency for Toxic Substances and Disease Registry, and the National Institute for Environmental Health and Safety), the Coast Guard, the Geological Survey, the National Oceanographic and Atmospheric Administration, the Fish and Wildlife Service, the National Marine Fisheries Service, the Nuclear Regulatory Commission, the Corps of Engineers; and the Departments of Transportation, Agriculture, and Housing and Urban Development. Major departments administering proprietary programs include Defense, Energy, and Interior. Environmental health and protection programs continue to be diversified into state "EPAs" as they were more than 20 years ago at the federal level. State level agencies include health departments, EPAs, and departments of ecology, conservation,**

**environmental quality, natural resources, pollution control, agriculture, atomic energy, and occupational health and safety.**

**For several years I stated that something like 75% of state environmental health and protection activities are administered by environmental health and protection agencies other than health departments at the state level. A recent study conducted by the Johns Hopkins School of Public Health indicates that I have been wrong. The figure is greater than I have been suggesting --- more like 85 % to 90 % of state level environmental health and protection activities are administered outside the purview of state health departments.**

**By comparing state level environmental health and protection expenditures with other public health expenditures as reported by the Public Health Foundation, we find that states spend approximately the same amounts on environmental health and protection as they do on all other public health programs.**

**Most local environmental health and protection programs are components of local health departments. However, a number of jurisdictions in the western U.S. have established separate environmental health or environmental management departments. Environmental health and protection activities are also administered by such local agencies as public works, housing, planning, solid waste management, special purpose districts, and regional authorities.**

**The trend to organizationally diversify environmental health and protection programs from health departments will continue in response to public perception of the importance and complexity of the environment, the demands of environmental advocates, and in response to many health departments becoming increasingly involved in health**

care issues in addition to public health. It is unrealistic to develop working programmatic relationships between water pollution control, for example, and any one of a number of health care treatment and rehabilitation programs. Further, the drift of federal, state and local health departments toward more and more health care (as providers of last resort) may translate into less and less leadership for environmental health within such health departments. The movement of environmental health and protection programs away from health departments is a part of our evolving governmental system. Health department based environmental health professionals have often exhibited a preference for such traditional programs as food protection, liquid waste disposal, solid waste management and vector control. In spite of public demand for local agency involvement in air, land and water pollution programs there often appears to be a reluctance to acquire the necessary skills and resources to participate what some refer to as environmental protection programs.

However, regardless of the titles or organizational arrangement, the lead agencies for environmental health and protection should be comprehensive in programmatic scope; staffed by personnel having the requisite competencies and leadership skills; have program design and priorities based on sound epidemiology, toxicology and risk assessment data; and have adequate analytical, data, legal and fiscal resources.

Environmental personnel who identify only with traditional health departments may be an endangered species eking out a frustrating existence in a constantly shrinking programmatic environment.

**As separate environmental health and protection organizations are created, every effort should be also made to insure that all environmental health and protection programs are transferred, so as not to fragment the environmental health and protection effort itself. Many jurisdictions have rationalized that such programs as food, water supply, and liquid wastes are "health," while air, water pollution and waste programs are not "health." In fact, all such programs share public health goals and are based on public health standards.**

**All such programs should be prioritized together. All require the same type of program methods, laboratory support, legal resources, epidemiology, prioritization, risk assessment, risk communication, risk management, surveillance and data.**

**In the future,**

- We should collectively understand that organizations, programs and public expectations will not be static.**
- We should realize that there are no final answers; and that problems, organizations, programs, and personnel competency needs will continue to evolve and become more complex.**
- We should remember that many public and environmental "healthers" have mistakenly tended to resist rather than lead changes in programs, organizations, and personnel competencies.**
- We should believe that anything as important as environmental health and protection deserves and demands organizational support, visibility and effectiveness which may translate into organizational diversification and programmatic change; and we must**

**understand that environmental constituents and political leaders frequently demand such change.**

- We should understand that every community and state has many "health agencies", but that only one is specifically titled a health department.**
- We should recognize that the cause of environmental health and protection is being served in a variety of agencies.**
- We should understand that in some jurisdictions, public health is being subsumed by health care, and that it takes a high degree of fantasy to develop a working programmatic relationship between health care (which is the treatment or rehabilitation of a patient under care) and hazardous waste management, or health care and pollution control, or health care and safe drinking water, or health care and food protection, or health care and any other environmental health and protection activity.**
- We should encourage environmental health and protection professionals to seek key leadership and scientific roles in all types of environmental health and protection agencies.**
- We should realize that the scope of environmental health and protection interests now embraces ecological issues as a full partner. Whatever long-term health threats may exist, the public also knows that pollution kills fish, dirties the air, creates a foul stench, ruins rivers, destroys recreational areas, and endangers plant and animal life.**
- We should ensure that schools of public health and other programs educating environmental health and protection personnel are inculcating the competencies to be effective in a wide variety of organization settings. Graduates must be competent not only**

**in the basic public health sciences, but also in analytical skills, communication skills, policy development, program planning skills, cultural skills, financial planning and management skills, and leadership skills. It is also essential that incumbent personnel be "re-treaded" with these skills through effective continuing education mechanisms.**

## **CONCLUDING THOUGHTS**

**To manage environmental programs in accordance with legislative and executive branch dictates is comparatively easy. Legislative and executive elected officials, understandably, have their own priorities based on the demands of their constituents.**

**But to be an effective environmental health and protection leader and impact the relative priorities of environmental health and protection problems based on sound epidemiology, toxicology and risk assessment, is extremely difficult and often career threatening. Leadership on the road to improved environmental quality is difficult and hazardous. There are many potholes in the way of providing effective, priority environmental health and protection services. The journey requires vision and steadfastness of purpose, as it is beset by emotional pressures, tempting comfortable detours, political surprises, and frequently offers no short-term gratification or pay-off. There are few if any rest stops along the way.**

**Ensuring a quality environment for this and future generations will require the combined efforts of government and the private sector, individual citizens and citizen groups, professional and trade groups, and academia.**