

Environmental Health and Protection: Century 21 Challenges

Larry J. Gordon

Editor's Note: Larry Gordon, Visiting Professor for the School of Public Administration at the University of New Mexico and 1961 Mangold Award recipient delivered this keynote presentation to the California Environmental Health Association on October 13, 1994. We felt it insightful and purposeful as we look toward the future of environmental health and protection.

The challenges of building and traveling bridges, defining the field, organizational and programmatic diversity, mission performance, programming for priorities, risk assessment, risk communication, competencies for practitioners, continuing education, the primacy of prevention, creative financing, action for environmental policy, and leadership for Century 21 are among the priority challenges to be confronted by environmental health and protection practitioners to be prepared to insure a quality environment for Century 21,

CHALLENGE: Building and Traveling Bridges

The terminology "environmental health and protection", rather than "environmental health" or "environmental protection", is indicated. This terminology is useful because both efforts exist for the same public health reasons, varying in the titles of the administering agencies. All such agencies are public health agencies, just as a health department is one type of health agency. It is important that attempts be made to build and travel bridges between all the various interests involved in the struggle for environmental quality, rather than building walls and protecting turf through terminology, attitudes, or actions.

Effective environmental health and protection programs depend on developing and utilizing constantly traveled communication bridges and network processes, connecting a wide variety of groups and agencies involved in the struggle for a quality environment and enhanced public health. A few such agencies and interests include: planning; land use, energy production; transportation; resource development; the medical community; news media; public works officials; agriculture; conservation; engineering; architecture; colleges and universities; product design and development; economic development; chambers of commerce; environmental groups; professional, trade, and industry groups; and elected officials. These relationships should be a matter of organizational policy and should be institutionalized rather than being left to chance or personalities.

Environmental health and protection services are integral components of the continuum of health services (Table 1). They are essential precursors to the efficacy of the other components of the health services continuum. Other health services include personal public health services (population-based disease prevention and health promotion), as well as healthcare (diagnosis, treatment, and rehabilitation of a patient under care on a one-on-one basis).

CHALLENGE: Defining the Field

There is only vague agreement regarding a definition for the field of environmental health and protection. Regrettably, definitions frequently tend to reflect the scope of responsibilities of some specific agency. Recently, I had the opportunity to discuss the issue of the environmental health and protection scope with the director of one of the largest local departments of health services in the world. He viewed environmental health and protection as the programmatic scope of environmental health and protection within his department, despite the fact that air pollution control had once been a health department responsibility that had been transferred to a special regional district some 40 years earlier. The individual had no institutional knowledge of this occurrence and said he had never thought of air pollution control as

environmental health and protection. Had air pollution still been a responsibility of his department, I feel certain he would have considered it to be a high priority environmental health and protection issue.

Table 1. Health Services Continuum.

Environmental Health and Protection	Health Promotion	Disease Prevention	Healthcare
Examples of Issues			
Clean Air	Substance Abuse	Infectious Diseases	Diagnosis
Clean Water	Family Planning	Clinical Prevention	Primary Care
Toxic Chemicals	Nutrition	PKU Screening	Case Management
Safe Food	Health Education	Glaucoma	Outpatient Services
Radiation	Violence	Diabetes	Clinics
Solid Wastes	Obesity	Osteoporosis	Treatment
Occupational Health	Tobacco	Cancer	Surgery
Hazardous Wastes	Mental Health	Suicides	Long-Term Care
Risk Assessment	Physical Activity and Fitness	Oral Health	Acute Care
Risk Communication	Access	Heart Diseases and Stroke	Rehabilitation
Risk Management		Maternal and Child Health	Cost Containment
Global Degradation		Access	Health Insurance
Land Use			Mental Health and Treatment
Noise			Developmental Disabilities
Disease Vectors			Alcohol and Drug Treatment
Housing			Access
Ecological Dysfunction			
Unintentional Injuries			
Access			

The "Report of the Committee on the Future of Environmental Health," as published in the *Journal of Environmental Health* in 1993, utilized a definition which was the result of numerous drafts peer reviewed by some 75 federal, state, and local environmental health and protection leaders throughout the nation. The "Report of the Committee on the Future of Environmental Health" defines environmental health and protection as:

... the art and science of protecting against environmental factors that may adversely impact human health or the ecological balances essential to long term human health and environmental quality. Such factors include, but are not limited to air, food and water contaminants; radiation; toxic chemicals; wastes; disease vectors; safety hazards; and habitat alterations.

Lack of consensus on a definition for the field of environmental health and protection makes it somewhere between difficult and impossible to have a coherent view of the field, the problems, the needs, the solutions, and the competencies required of environmental health and protection practitioners. Without a definition of our product, personnel don't know if they are marketing an obsolete buggy whip or the latest electronic gadgetry.

Public health personnel have traditionally justified, designed, and managed environmental programs based on public health components. But as environmental problems, priorities, public perception and involvement, goals, and public policy have evolved, ecological considerations have become increasingly important. Whatever long-term health threats exist, the public and public policy leaders know that pollution is also killing fish, limiting visibility, creating foul stench, ruining lakes and rivers, degrading recreational areas, and endangering plant and animal life.

The 1990 Report of EPA's Science Advisory Board, "Reducing Risk," 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 supports systems natural resources provided by healthy ecosystems.

CHALLENGE: Organizational and Programmatic Diversity

The trend to organizationally diversify environmental health and protection programs will continue in response to the priority of environmental health and protection, the demands of environmental advocates, and the perception that many health departments have become significantly involved in healthcare to the detriment of environmental health and protection as well as other public health issues. It is unrealistic to develop programmatic relationships between water pollution control, for example, and any one of a number of healthcare (treatment and rehabilitation) programs. When the Environmental Protection Agency was created by Executive Order in 1970, many responsibilities were diversified from the U.S. Public Health Service and traditional health departments to agencies having various titles, particularly among state governments. Obviously, all these programs are still environmental health and protection, regardless of their organizational placements. They still exist primarily due to a public health rationale, and standards and regulations are based on public health needs.

Environmental health and protection could conceivably be defined by a laundry list of environmental health and protection problems or by enumerating the scores of environmental health and protection programs. Both pose difficulties in that problems and programs are constantly evolving. Therefore, it is essential to define the field of environmental health and protection.

Dozens of definitions of the field of environmental health and protection could be found. Developing a new definition is frequently a standard practice at various meetings, workshops, and symposia. Each new definition is sufficiently different to be confusing and thus aids in promoting further program diversification and lack of increasing responsibilities of federal, state, and local health departments as providers of healthcare may translate into inadequate leadership and priority for environmental health and protection within health departments. Additionally, health departments have found it difficult to deal with the ecological aspects of environmental health and protection.

The diversification of environmental health and protection services may be seen as a part of the nation's evolving governmental system. Such organizational diversification does not mean that environmental health and protection programs are no longer a basic component of the field of public health. While each community or state has only one health department, every community and state has many other public health agencies including numerous environmental health and protection agencies.

Environmental health and protection, like other components of public health, is not a profession or a discipline, but is a cause and a field engaged in by a wide array of personnel practicing within a broad and complex spectrum of organizations.

Those interested in environmental health and protection should recognize that the public and the environment are also served by agencies other than health departments. Academic institutions preparing students for environmental health and protection careers should orient students to leadership roles in the multitude of agencies involved.

There are dozens of environmental health and protection programs administered by federal, state, and local official agencies. Among these are: ambient air quality, water pollution control, safe drinking water, indoor air pollution, noise pollution control, radiation protection, sanitation of eating and drinking establishments, sanitation of food processing establishments, occupational health and safety, thermal pollution, childhood lead poisoning, acid deposition, meat inspection, disaster planning and response, cross-connection elimination, shellfish sanitation, institutional environmental control, pure food control, housing conditions, recreational area environmental control; poultry inspection, solid waste management, hazardous waste management, vector control, pesticide control, onsite liquid waste disposal, land use, milk sanitation, toxic chemical control, unintentional injury prevention, and global environmental health and protection issues such as ecological dysfunction, habitation destruction, possible global warming, possible stratospheric ozone depletion, planetary toxification, desertification, deforestation, overpopulation, and non-renewable resource consumption.

At the federal level, environmental health and protection agencies include: Environmental Protection Agency; Department of Labor; U.S. Public Health Service, including the National Institute of Environmental Health Sciences, National Center for Environmental Health, Bureau of Health Professions, Food and Drug Administration, Indian Health Service, Agency for Toxic Substances and Disease Registry, and the National Institute for Occupational Safety and Health; Coast Guard; Geological Survey; National Oceanographic and Atmospheric Administration; Nuclear Regulatory Commission; Corps of Engineers; Department of Transportation; Department of Agriculture; and the Department of Housing and Urban Development.

Major federal departments administering proprietary environmental health and protection 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 such titles as Health, EPAs, Ecology, Conservation, Environmental Quality, Natural Resources, Pollution Control, Agriculture, and Labor.

A recent study conducted by the Johns Hopkins School of Public Health under contract with the Bureau of Health Professions of the Public Health Service completed in 1994 indicates that some 85% of state government environmental health and protection activities are administered outside the purview of state health departments.

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

At the local levels, health departments are usually the lead agencies. Additionally, such agencies as environmental health, planning, public works, inspections, solid waste management, housing, councils of government, special purpose districts, and regional authorities also have major environmental health and protection responsibilities.

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.

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 "public health," while air, water pollution, and waste programs are not "public health." 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 personnel competencies, program methods, laboratory support, legal resources, epidemiology, prioritization, risk assessment, risk communication, risk management, surveillance, and data.

CHALLENGE: Mission Performance

Environmental health and protection agencies should have missions of delivering services in such a manner as to protect the health of the public and the quality of the environment.

Additionally, environmental health and protection agencies should have missions of stimulating interest in related areas where they may not have primary responsibility and technical expertise. For example, it may be desirable to support and promote such environmental health and protection related activities as long range community planning, zoning ordinances, plumbing codes, building codes, solid waste systems, economic development, energy conservation, and transportation systems:

Other agencies, such as agriculture departments; have an obvious and appropriate mission of promoting and protecting a given industry or segment of public interest. Conflicts of interest occur when missions are mixed, thereby resulting in the familiar "fox in the henhouse" syndrome. Such conflicts of interest result in the public being defrauded rather than receiving the protection they deserve. If environmental health and protection agencies do not fully develop and understand the necessity of a mission of protecting the health of the public and the quality of the environment, they may end up actually protecting or promoting the interests of those they are charged with regulating.

CHALLENGE: Programming for Priorities

There is widespread disagreement regarding environmental health and protection priorities, acceptable risk, and organizational issues. 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 overpopulation.

A December 1991 survey conducted by the Institute for Regulatory Policy of nearly 1,300 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.*

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 Science Advisory Board, "Reducing Risk" lists the following as the major risks to human health: ambient air pollutants, worker exposure to chemicals, indoor air pollution, and drinking water pollutants. While not EPA programs, food protection and unintentional injuries should be added to this list by any rational public health priority system. Legitimate scientific debate continues over the proper standard and appropriate measures for the issue of '---childhood lead poisoning, but many researchers believe that childhood lead poisoning should also be a high priority issue. As risks to the natural ecology and human welfare, "Reducing Risk" lists 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 EPA list also includes oil spills, groundwater pollution, radionuclides, acid runoff to surface waters, and thermal pollution.

Local priorities will vary considerably, but should be based on individual community risk assessment, cost-benefit analysis, and public demands, as well as legislative delegation of responsibilities.

CHALLENGE: Risk Assessment

Considering the serious differences in recommended priorities between scientists and those of the public and political leaders, risk assessment must be considered a high priority issue to be understood and practiced by all interests involved in protecting the health of the public and the quality of the environment.

We do not live in a risk-free society or environment; therefore, the goal for many environmental health and protection programs may not necessarily be "zero-risk" but should be "net impact." The pursuit of zero-risk as a standard or goal is frequently unnecessary, economically impractical, frequently unattainable, and may create unfounded public concern when zero-risk is not achieved. Additionally, the pursuit of zero-risk as a goal for one issue may preclude resource availability to deal with higher priorities.

Utilizing sound scientific principles to assess risk is vital to recommending priorities, designing environmental health and protection programs, requesting funds, and evaluating control efforts. In addition to assessing human health risk, risk assessment procedures may also be utilized to determine ecological, economic, and quality of human life impacts.

Risk assessment has always been utilized informally and even intuitively by public policy makers and environmental health and protection personnel. Utilizing risk assessment mathematical models has been a comparatively recent development. Whenever a decision or recommendation has been made to develop a policy or manage an environmental problem based on available information, a risk assessment has been performed. At times, environmental personnel must make major emergency decisions based on incomplete but compelling information without having the luxury of waiting until incontrovertible evidence is available.

Every environmental health and protection practitioner need not be a technical expert in risk assessment modeling procedures but should understand their usefulness and limitations.

Century 21 environmental health and protection practitioners:

- Must 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 any prevailing misunderstanding of risk:

- Must 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 slow 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;
- Must 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;
- Must define problems and their attendant risk 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;
- Must understand that a low risk program becomes difficult to stop or alter once a bureaucracy or an industry is developed to promote the program; and
- Must be wary of accepting problems based only on extrapolations and correlations rather than on good epidemiological and toxicological cause-and-effect studies.

CHALLENGE: Risk Communication

Experience indicates that many environmental health and protection practitioners have not demonstrated adequate skills as risk communicators. This is one of the reasons environmental health and protection priorities and policies frequently differ from those recommended by scientists. In the absence of continuing effective risk communication, sound risk assessment is merely an academic exercise. Many practitioners continue to confuse public information and the distribution of public information materials with the art of risk communication.

Risk communication is an art requiring complete openness throughout any planning and decision process, as well as embracing, including; and involving appropriate interest groups. Failures to communicate risk and develop scientifically valid priorities and policies are frequently linked to the failure to involve and educate the public and appropriate interest groups throughout the process and openly discuss the needs, assumptions, alternatives, as well as the data on which risk has been assessed.

Century 21 environmental health and protection practitioners must understand that risk assessment and risk communication are among the most critical environmental issues. Establishing priorities and communicating risk on the basis of the risk to public health and the environment is a basic precursor to improved environmental management. While resources should be allocated to address actual and significant risks, public perception drives the response of elected officials and public agencies.

CHALLENGE: Competencies for Practitioners

The field of environmental health and protection requires the involvement of scores of disciplines as well as interdisciplinarily trained personnel. Additionally, the efforts necessitate personnel capable of functioning in roles varying from routine inspection and surveillance levels through management, policy, education, and research components. Depending on the type of agency and sophistication of programs, effective efforts demand an alliance of physical scientists, life scientists, social scientists, educators, physicians, environmental scientists, engineers; data specialists, planners, administrators, laboratory scientists, veterinarians, attorneys, economists, political scientists, and others in order to fully utilize the variety of environmental health and protection program activities.

A 1988 U.S. Public Health Service Bureau of Health Professions report indicated that only 11% of the environmental health and protection workforce had formal education as environmental health and protection professionals, and estimated a need for 120,000 more such professionals to address problems in several key areas.

The 1990 EPA Science Advisory Board publication, "Reducing Risk," states that: *The nation is facing a shortage of environmental scientists and engineers needed to cope with environmental problems today, and in*

the future. Moreover, professionals today need continuing education and training to help them understand the complex control technologies and pollution prevention strategies needed to reduce environmental risks more effectively. Most environmental officials have been trained in a subset of environmental problems, such as air pollution, water pollution or waste disposal. But they have not been trained to assist and respond to environmental problems in an integrated and comprehensive way. Moreover, few have been taught to anticipate and prevent pollution from occurring or to utilize risk reduction tools beyond command-and-control regulations. This narrow focus is not very effective in the face of intermedia problems that have emerged over the past two decades and that are projected for the future.

Other significant employers of environmental health and protection personnel, such as the Department of Defense and the Department of Energy, as well as the private sector, have also emphasized the unmet need for properly qualified professionals.

Important competencies for environmental health and protection practitioners include:

- relevant environmental health and protection sciences such as biology, chemistry, physics, geology, ecology, and toxicology
 - environmental health and protection technical issues
 - epidemiology • biostatistics
 - etiology of environmentally induced diseases
 - risk assessment, communication and management
 - communications and marketing
 - interest group interactions
 - personnel and program management
-
- Must better 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;
 - Must recognize that some of the news 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;
 - Must recognize that if all the alleged environmental catastrophes were scientifically factual, we would have many times the actual morbidity and mortality rates;
 - Must refute stories which are not based on sound epidemiology, toxicology, and risk assessment;
 - Must question reports which base a problem on one anecdotal example, e.g., one cancer patient near a hazardous waste site, that capitalizes on appeal to the emotions;
 - Must beware of individuals and organizations purporting to use science to front and further their organizational and political objectives;
 - Must recognize that peer-reviewed science does not depend on media manipulation, Hollywood personalities, or slick public relations;
 - Must beware of predicted morbidity and mortality figures pulled out of the air by self-styled experts;
 - Must 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;
 - Must recognize the difference between science-based facts and public perception;
 - organizational behavior
 - public policy development and implementation
 - environmental health and protection planning
 - cultural sensitivity • strategic planning
 - financial planning and management
 - environmental health and protection fiscal impacts
 - environmental health and protection law
 - federal, state, and local environmental health and protection agencies
 - the political process

Additionally, students must be imbued with the requisite environmental health and protection philosophy and vision as well as the strong ambition to lead.

CHALLENGE: Continuing Education

Formal education in environmental health and protection was once considered to be a vaccine that would prevent ignorance and ineffectiveness later in one's career. However, such formal education is inadequate by itself and does not provide personnel all knowledge and skills for leadership and effective careers. Continuing education is an essential component of a career, not only to be effective, but personnel learn more readily as they encounter specific needs. Such continuing environmental health and protection education should be budgeted, timely, relevant, economical, and convenient, as well as strongly supported by management.

Specific knowledge and skills which many environmental health and protection personnel have not acquired during formal education include organizational behavior, administrative skills, political process skills, environmental health and protection law, financial impacts of programs, environmental health planning, financial management, program planning and evaluation, developing and implementing public policy, epidemiology, toxicology, risk assessment, and risk communication.

CHALLENGE: The Primacy of Prevention

Planning for environmental health and protection is another key support function that has not been widely understood, developed or utilized. While the field of environmental health and protection is based on prevention in many program areas, a preponderance of effort and funds are devoted to remediation of contamination and pollution created as a result of earlier actions taken by other interests in the public and private sectors.

Environmental health and protection practitioners must have the knowledge, skills, and authority to become effectively involved in prevention during the planning, design and construction stages of energy development and production, land use, transportation methods and systems, facilities design and construction, resource development and utilization, and product design and development activities.

Developing the capacity and authority to function effectively in environmental health and protection planning will be necessary as environmental health and protection agencies strive to function in a primary prevention mode, rather than secondary prevention or treatment of the environment after the contamination or pollution has been produced and emitted. Environmental policy must be based on prevention if there is to be any hope of preventing further resource depletion and ecological destruction and minimizing the health impacts of environmental contaminants.

CHALLENGE: Creative Financing Historically, environmental health and protection programs were funded by general tax revenues. Currently, environmental health and protection agencies are finding it necessary to be creative in funding additional services or, in some areas, retaining existing levels of funding. Existing activities and proposed expansions must be evaluated and prioritized so as to address the higher priorities in any specific jurisdiction. Where additional general fund support is not available, agencies must consider reallocating budgets from lower priority activities or developing new sources of revenue, such as fees for service and/or pollution taxes and other market-based incentives.

Prioritizing funding requests will require the best skills in epidemiology, toxicology, and risk assessment. Developing creative funding mechanisms will require that agency personnel have basic knowledge and skills in financial issues. Marketing such budget requests will increasingly require competency in risk communication and public policy development.

CHALLENGE: Action for Environmental Policy

A recent letter signed by both the Executive Director of the National Environmental Health Association and the Acting Director of the National Center for Environmental Health invited individuals to participate in a roundtable discussion regarding the future of environmental health. Among other things the letter spoke of "environmental health professionals responding creatively to changes in the status quo." Those few words embody one of the most significant issues facing environmental health and protection personnel. Environmental health and protection personnel should not simply respond, they should design and lead necessary changes in the status quo. They should understand and participate in the development of public policy. Public policy should be a required competency taught in schools of public health, environmental health and protection academic programs, and continuing education. Environmental health and protection personnel should be prepared for and filling key policy and leadership roles in environmental health and protection agencies at the federal, state, and local levels. This means filling top

level exempt positions, instead of the comfortable security of lower level, non-policy, non-leadership roles.

Additionally, the field of environmental health and protection needs a strong national organization dedicated to effectively impacting environmental health and protection policy, instead of simply having annual meetings where a good time is had by all, papers are presented, and old acquaintances are renewed. Lacking such an organization, environmental health and protection policy and priority development is dominated by environmental extremists promoting self-serving agendas, rather than efforts based on sound epidemiology, toxicology, and risk assessment.

CHALLENGE: Leadership for Century 21!

Environmental health and protection will become an even higher priority issue in our society, and the public will expect and demand greater levels of protection from both the public and private sectors. Population growth and shifts, resource development and consumption, product and materials manufacture and utilization, wastes, global environmental deterioration, technological development, changing patterns of land use, transportation methodologies, and energy development and utilization will create additional and unanticipated problems. The competencies of properly prepared environmental health and protection practitioners will be required if prevention and control efforts are to anticipate and keep pace with these chances.

The targeted education, involvement, and leadership of environmental health and protection professionals will require significant changes in their current preparation and philosophy. As environmental health and protection issues assume a higher priority and demand greater visibility and emphasis, the tendency to broaden and diversify the programs into new agencies will increase. Retaining existing environmental health and protection services in traditional health departments will require significant changes in essential knowledge and skills of public health leaders, as well as changes in health department organization and priorities to keep pace with public and political expectations.

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 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, and 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.

The future of environmental health and protection is bright for those practitioners who exhibit the necessary competencies and who provide leadership in protecting the public health and environmental quality for Century 21. Those who are inflexible and rely on past accomplishments, the status quo, and misguided organizational turf protection will be numbered among endangered species eking out a subsistence in a constantly shrinking organizational environment. Anticipating and meeting the challenges of Century 21 will insure a bright future for the field of environmental health and protection and enhanced status for those professionals prepared to meet the challenges of the new century.

....

• ***Journal of Environmental Health***