

Commission on Risk Assessment and Risk Management

Symposium on a Public Health Approach to Environmental Health Risk Management

8 August 1997
Washington, DC

Introduction

Panel 1: What does it mean to adopt a public health approach to setting priorities for environmental protection?

Panel 2: Investing in public health improvements as regulatory tradeoffs - do the new ozone and particulate air quality standards offer such an opportunity?

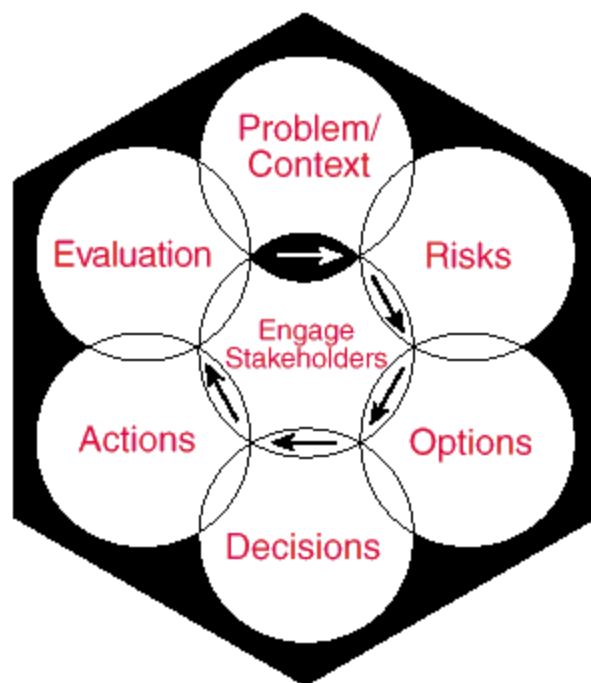
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Introduction

Volume 1 of the Risk Commission's final report, *Framework for Environmental Health Risk Management*, describes a decision-making process (see figure below) that begins by examining and characterizing an environmental health risk problem in its larger public health or environmental contexts. Understanding the context of a risk problem is essential for effectively managing the risk. Historically most risk management has occurred in an artificially narrow context that considers just one chemical, one environmental medium, and one risk. Because this narrow context does not reflect the true complexities of risk situations, it results in less effective risk management decisions and actions. The Commission's Framework expands the context of risk management by including an initial step to explicitly consider and define a comprehensive public health or ecological context for any specific risk.



The Commission believes that there is a compelling public health and ecological case to be made for modernizing our approach to environmental regulation. To a considerable extent, we are "fighting the last war" on the environment, using prescriptive, media-specific laws and centralized institutions designed in the 1970s to address--quite successfully--the legacy of environmental contamination from the post-World War II industrial boom. Problems and knowledge have changed dramatically over the last twenty-five years.

We need creative, constructive thinking about goals, choices, and governance tools that would facilitate fair and open discussion of tradeoffs among environmental health and public health goals. The goal is to focus our environmental protection resources where they may have the greatest impact on public health while continuing to address other public objectives.

A public health approach to risk management:

- Evaluates the adverse health effects experienced by a population, identifies possible causes of those effects, and seeks to determine the relative contribution of each cause to the effects.
- Emphasizes prevention, to reduce future needs for cleaning up.
- Focuses on the effectiveness of actions, instead of just compliance with prescriptive "command and control" regulations.

The public health foundation of environmental health protection has been obscured by legalistic, technical, centralized decision-making processes that are often unrelated to the problems faced by local communities (Goldstein 1995). The public health basis of our environmental statutes has been obscured by their reliance on cleaning up problems after-the-fact instead of preventing them and by their disregard for the size of the exposed population, relying on an often hypothetical "maximally exposed individual." A greater focus on public health principles would better serve the environmental health objectives of our regulatory statutes, although it is the dictates of those very statutes that often pose the greatest impediments to a focus on public health.

On August 8, 1997 the Commission on Risk Assessment and Risk Management convened a symposium

with invited participants to address the need for and nature of a public health approach to environmental health protection and to explore the idea of an "environmental health improvement market." This report summarizes the presentations of the invited participants and their conclusions and recommendations. The meeting agenda and a list of the participants are appended.

Panel 1: What does it mean to adopt a public health approach to setting priorities for environmental protection?

Panel 1 addressed the following topics:

- Defining a "public health approach" to environmental protection.
- Clarifying the advantages and disadvantages of a public health approach.
- Identifying current statutory, institutional, and other legal barriers to a public health approach.
- Identifying social or cultural barriers to a public health approach.
- Identifying changes needed to adopt a public health approach.

Lynn Goldman, Assistant Administrator, Office of Prevention, Pesticides and Toxic Substances, U.S. Environmental Protection Agency, Washington, DC: Public Health Focus Environmental Health Statutes

Over the last 25 years, our environmental laws and regulations have achieved much. However, there is a need for change. Many of the things that worked well during the last 25 years are not necessarily the approaches that are going to work well for us in the future. We need to build on the existing framework of national standards.

Focus on children has been a keystone of the Clinton administration's efforts to use a public health-based approach to protecting the environment. Children and other vulnerable members of the population should be our priority. The Food Quality Protection Act passed unanimously in 1996, said that we need to pay particular attention to protection of children, to look at the potential for prenatal effects and postnatal developmental effects, and to examine exposures to pesticides across the different foods that children eat, drinking water, and residential and other exposures in our risk assessments. This public health approach to food safety makes scientific and common sense.

Our new standards for ozone and particulate matter likewise reflect a public health approach to protect children, protect those who have asthma and other respiratory diseases, and use the available epidemiological evidence.

The new Safe Drinking Water Act Amendments gave EPA the flexibility to determine on a public health basis which standards need to be developed next, rather than Congress prescribing to EPA a list of contaminants for which standards must be developed.

Environmental protection initiatives often assume something that we cannot guarantee--that we will actually have information to inform the decision-making process. Congress has seen the need to support EPA's research and development program. However, we need more effort on the part of the private sector, especially the chemical industry, in making sure that we have data about chemicals. Last week the Environmental Defense Fund issued a study indicating that the most basic toxicity testing results

cannot be found in the public record for 71 percent of their sample of high-volume chemicals in commercial use. It is difficult to set priorities when we basically have no information for so many of the chemicals that might be of concern.

Right-to-know is a very important principle for a public health-based approach. We have seen over the last few years, with the dramatic reduction of the emissions of chemicals on the Toxic Release Inventory, that right-to-know has been an important tool for achieving real results for the environment. We have created at EPA a new Center for Environmental Information and Statistics to make the wealth of information at EPA much more accessible. But we're going to need a lot of participation from the public and others to determine how to best do that.

Barry Levy, President, American Public Health Association, Boston, MA: Ingredients for a Successful Public Health Approach

A public health approach to environmental protection is highly feasible and highly desirable. There are many advantages to a public health approach and few, if any, disadvantages. Environmental health is a core and critically important element of public health. Environment and health together are a major priority of the American Public Health Association.

One definition of public health--in fact, the Institute of Medicine definition--is that public health is what we do as a society collectively to assure conditions in which people can be healthy, including, of course, environmental conditions. A recent poll by the Harris organization showed that there is strong support for public health values and concerns. Over 80 percent of the American people support clean air, clean water, and the control of toxic wastes. Yet there is very little understanding, as shown by that survey and other surveys, among the American people of what public health is and how it operates. One of our goals in the American Public Health Association is to put the public back into public health, including environmental public health.

Over the last three decades there have been unfortunate schisms between environmental protection and public health, both conceptual and organizational. We separate the work environment from the ambient environment, even though the work environment is the place where people often have the highest exposure to chemical and other hazards. We separate indoor and outdoor environments somewhat artificially. I think it is unfortunate that many people in public health don't use the language of risk assessment and risk management. These schisms aren't easy to bridge, but we must do all that we can to bridge them.

I have 10 recommendations for what is needed to bring a public health approach to environmental protection.

1. *Surveillance*, the ongoing, systematic collection, analysis, and dissemination of data to prevent disease and injury and to identify outbreaks and other disease or injury trends of public health significance. We need surveillance for exposures of public health concern and for adverse health events. Despite many advances in our capabilities for environmental and occupational health surveillance, there is a disturbing trend that the local and state public health infrastructure across the country is deteriorating, especially for surveillance systems.
2. *Assessment, including evaluation*. Public health professionals routinely use epidemiology, exposure assessment, and other sciences to characterize problems, identify ways to reduce or eliminate them, and determine the most effective control measures.

3. *Prevention*, a core value and principle of public health, especially primary prevention before adverse health effects occur.
4. *Think globally and act locally*. Public health problems, including environmental public health problems, need to be seen in a broad geographic context. Pollutants cross not only state borders, but also national and continental borders.
5. *Sustainability*, both in developing countries and for sustainable systems here in the United States. We must have appropriate positive incentives, public involvement, and investment--financial and personal--in sustainable stems.
6. *Population-based approaches*, an emphasis on those who are at greatest risk, those who are undeserved, and the widening gaps between the haves and have-nots.
7. *A holistic approach*. There are multiple factors, multiple environments, and multiple disciplines that need to be coordinated if we want to assess and solve problems. We need to think of whole human beings, whole communities, and entire populations, and both physical and socio-cultural environments that support healthy attitudes, healthy behavior, and environmental health.
8. *A strong scientific base* to guide public health activities. Environmental public health depends on epidemiology, biostatistics, environmental chemistry, industrial hygiene--a whole range of physical, behavioral, and social sciences. All too often, decisions are based on ideology and not on science. Unfortunately, we see more and more polarization based on ideology in this country and an increasingly litigious approach to problems rather than a more cooperative approach to finding practical, sensible solutions that are based on science and core values, not ideology.
9. *An evolving and dynamic nature*. This year we celebrate APHA's 125th anniversary. Public health clearly has evolved considerably in many ways over that period of time. It is not just the science base that is evolving. Populations are becoming more diverse and aged. Technology is evolving, with the information and communications revolution. The biotech/genetics revolution impacts heavily on public health, including environmental public health. Certainly the threats to environmental health and environmental protection are evolving. We need to deal both with the threats of today and the threats of tomorrow.
10. *Put the public into public health*. Public health is a societal function and not just what we environmental scientists or public health professionals do. Therefore, we need not only to communicate the environmental protection and environmental health messages to society at large, we need to really engage the public in public health, in environmental public health, and in the issues that affect them and their families and their communities. We need to actively reach out to individuals and to communities, not only to communicate a message but first to listen and then to work with communities and groups to develop policies and programs that serve the interests of public health.

There are three other necessary ingredients for a successful public health approach to environmental health protection: values, vision, and leadership.

Values are central to public health; in fact, many people equate public health with justice. Values include equity, societal responsibility, and human rights, including the right to a healthful and safe environment.

Vision, like the vision embodied in the work of the Commission, includes our capability to dream the impossible. Many of the greatest public health achievements, including environmental public health achievements, have come out of visions that initially were considered impossible by the broader society. Kierkegaard once said that one of the problems we face as human beings is that life can only be understood looking backwards, but it must be lived forwards. In order to do that effectively, we need to have vision and the courage of our convictions and values.

Finally, we need leadership to translate values and vision into policies and programs to support

environmental protection and environmental health. We need leadership to engage the public and create partnerships to bring about environmental public health and to bring about a public health approach to environmental protection.

Richard Jackson, Director, National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, GA: Balancing Public and Environmental Health

The average life expectancy of Americans now is almost twice what it was a hundred years ago. Much of that increase has come from a mixture of economic development and public health interventions--immunizations, clean air, clean water, better food. It was very clear to many Americans by the 1960s, however, that the public health approach that had focused so successfully on control of infectious diseases needed to embrace a new challenge: chemical contamination of the environment. Despite occasional errors and foolishness in the area of environmental regulation, there has been tremendous progress since then.

One of my concerns about leaving in regulatory the public health activity that deals with environmental health is that regulatory agencies are so much under the thumb of the political process. This mutes the aggressive and intensive dialogue that needs to occur between public health practitioners and environmental regulators. There are many examples illustrating the problems that have occurred as a result of subordinating public health to environmental regulation.

Reduction of lead poisoning in children has been one of the most profound public and environmental health successes of the last hundred years. Thanks to the removal of lead from gasoline, overall blood lead levels in the United States have dropped dramatically--a joint public health and environmental regulatory effort. The average blood lead in 1980 was around 12 or 13 μ g/dL for the U.S. population but now our average blood lead levels are lower than what was thought to be possible 20 years ago.

Despite all the big public health and environmental health issues that have been addressed during the last 12 months, the National Center for Environmental Health has approximately five epidemiologists who work only part-time on these issues. Of CDC's 6,000 employees, none of the staff is designated to work solely on air pollution issues. For sensible public policy, there has to be a balance between the public health sciences and environmental regulators.

Devra Davis, Program Director, Health, Environment and Development, World Resources Institute, Washington, DC: Need for Environmental Health Indicators

The politic philosopher Carl Cranor has said that regulating toxics is like looking through a glass darkly, because of all the things we cannot know. Thus, we need to rely on new tools, such as environmental health indicators recommended by the Brundtland Commission on Sustainable Development in 1987. Often, policies have to be set with limited information to prevent future harm. People who warned in the 1940s that lead gasoline would be a public health disaster were ignored, as were those who recognized the relationship between cigarette smoking and lung cancer. They were told, "We don't have all of the data." Well, we never have all of the data. It is inherent in science that we always need more data. But we should not use the fact that we need more data to prevent us from taking action when the down-side risk may be very great.

What constitutes a good indicator? It's something that commands attention, makes sense, and motivates people. It turns data into information that people can understand. There are two basic types of indicators. One is exposure-based, which would be based on information on sales or actual emissions or concentrations and, if you can get them, real exposure data in humans. An exposure-based indicator would also take into account actual populations at risk. For example, a map in the *New York Times* now shows the smog patterns in the United States. Such maps will be provided by EPA as a regular service, so that people will be able to see what the projected smog index is for their region. It will be available on the web, and it will be released for the local newspapers. The second type of indicator is health-based, such as the percentage of the population that exhibits specific diseases or ill effects attributable to environmental conditions. These indicators are more difficult to identify.

Justice rests on the notion that everybody can be treated equally and that the welfare of one is not overridden by another. It is very difficult to have equality of exposure when it comes to toxic pollutants. And because there will be major limits on what we can know, we must infer the consequences of inaction as well as the consequences of action. Locally and globally we need tools to help take precautionary actions based on good judgment.

Tom Burke, Associate Professor of Environmental Health Policy, Johns Hopkins School of Hygiene and Public Health, Baltimore, MD: Impediments to a Public Health Approach

The legislative mandates of the last 25 years have narrowly defined the environment. They have also established both philosophically and fiscally an agenda that is separate from that of the traditional public health community. We now have an enormous regulatory infrastructure that is driven by media-specific, source-specific, and probably molecule-specific approaches that shape everything from the way state and local health departments and environmental agencies do business, to what research gets funded at universities. The American public has very fundamental public health concerns about the environment that really have not been answered. Despite all the progress we've made, the question still remains: Are all these programs really improving public health? Particularly for the urban areas of our country, representing a major proportion of the population, the answer is a resounding no.

Last week my colleagues and I released the results of a two-year study looking at public health and multi-media environmental aspects of south and southwest Philadelphia (Burke and Shalauta 1997). The people living around those heavily industrialized areas were concerned that too many people there were dying, which is a pretty good public health indicator. The percentage increase in mortality from all causes there is more than twice that of the rest of the nation. A substance-by-substance approach was not going to answer the fundamental public health issues underlying those increased risks. So we used a public health approach, putting risks in perspective and trying to focus on the things that are important to public health.

For the parameters that we use to characterize the environment--TRI releases, ozone exceedances, chemicals in drinking water, air quality, water quality, emissions--there have been dramatic improvement in Philadelphia over the last 20 years. But how do these narrow parameters relate to public health and community concerns? What do we know about exposures and associated risks? The data base to answer those questions is completely inadequate. For example, there are thousands of potential sources of pollution in south and southwest Philadelphia, including mobile sources, small businesses, and major industries. Only eleven of those sources report to the TRI. A profile of potential exposures cannot be derived from the TRI, which represents only a small part of the universe.

I have several observations and recommendations regarding the major impediments to implementing what the Commission is recommending.

1. *The laws.* The environmental health laws exclude public health, financially and infra-structurally.
2. *The yardsticks.* The environmental indicators we seek haven't included the most basic indicator, the health of the public. The continuum between ecological health and human health is real; the health status of the population depends upon a healthy environment. Part of the problem is the absence of adequate surveillance.
3. *Economics.* A lot of health issues are economic. Opportunities, jobs, health insurance, schools, a fiscally sound community, and a voice in environmental zoning issues are very important to both personal and community health.
4. *Communication.* There is very little communication between the environmental side of the fence and the public health side of the fence.
5. *Multidisciplinary training.* Environmental health professionals are not trained to do a public health job.
6. *Stakeholders.* Environmental health laws, enforcement practices, and monitoring procedures fail to address fundamental public health questions.

Panel 2: Investing in public health improvements as regulatory tradeoffs - Do the new ozone and particulate air quality standards offer such an opportunity?

Recognizing that EPA in July 1997 promulgated its revised Clean Air Act standards for ground-level ozone and particulate matter (subject to Congressional review), the Commission focused on how the new standards might be implemented to maximize public health benefits. In the case of ozone, the standard will be tightened from 0.12 parts per million over a 1-hour peak on the fourth worst day in a three-year period to 0.08 parts per million over an eight-hour interval for the fourth worst day each year, averaged over 3 years. In the case of fine particulate matter, a new standard will be created for 2.5- μ m particles. Health effects of ozone pollution include decreased lung function, respiratory symptoms, lung inflammation, and increased hospital admissions and emergency room visits, particularly for children and adults with pre-existing respiratory diseases such as asthma. Small particles have been linked to premature death and increased hospital admissions and emergency room visits, primarily for the elderly and those with cardiopulmonary disease, and to decreased lung function, particularly in children and individuals with asthma.

Debra Knopman, The Progressive Foundation, Washington, DC: Proposal for a "Public Health Improvement Market"

One approach to the question of how to maximize protection of public health while reducing the costs of managing risks from ozone and particulates is that of a public health improvement market. This market would bring together willing sellers of public health improvements, such as public health departments and community groups, with willing buyers seeking alternatives to further emissions reductions. EPA opened the door to such a concept by proposing a Clean Air Investment Fund that would allow sources with control costs in excess of \$10,000 per ton of pollutant to pay a set annual amount to fund more cost-effective emissions reductions by non-traditional and small sources.

In this proposal, a limited number of sources meeting current ozone and particulate standards would be

offered the opportunity to make investments in public health programs rather than seeking marginal additional decreases in emissions. Protections would be put in place to avoid individual source backsliding, distributional inequities, adverse health effects, and significant ecological damage. Five elements are envisioned as part of the market approach.

1. *Tradable instruments.* A common metric for risk reduction would be developed to allow the valuation of various investments.
2. *Baseline standard of conduct.* Individual sources making alternative investments would be subject to legal sanctions if they did not maintain their current fully compliant level of environmental performance. Continuous monitoring of the results of alternative investments would be needed.
3. *Public participation.* The public must be fully engaged in the design and operation of a market approach.
4. *Accurate, accessible information.* The public and the regulators would need understandable, standardized, and accurate information about risks being traded.
5. *Public verification.* A risk trading approach requires clear measures of benefits. It will succeed or fail depending on public confidence that the alternative investments demonstrably meet specific expectations.

The public health investment market idea builds on programs already in place. For example, California's South Coast Air Quality Management District allows companies who do not participate in vehicle emission reduction programs to make payments to an escrow fund that is then used to buy alternatively fueled vehicles for city services, such as trash trucks or school buses, retire old clunkers, or make other vehicle emission reductions. As a result of the 1996 amendments to the Safe Drinking Water Act, water suppliers can avoid costly controls on radon in drinking water and, instead, invest in measures to mitigate exposures to airborne radon, generally a far greater source of exposure. The goal of Panel 2 of this symposium was to examine the feasibility and desirability of such public health investments and tradeoffs,

Alan Krupnick, Senior Fellow, Resources for the Future, Washington, DC: Economic Criteria

Four concerns are raised when an economist looks at the public health approach. One is the net effects of the emission reductions or public health investments on public health. For example, the cost of pollution abatement could lead to plant closures, producing unemployment, which could lead to alcoholism, domestic violence, and other detrimental health effects. The second concern is whether substitution risks are adequately understood. Third, economists place no special emphasis on prevention. While prevention may be the most cost-effective way of addressing public health issues in many cases, it may not be in certain cases and so must be examined. In fact, standard discounting methods may render benefits nearly worthless. Finally, the economist is interested in overall public welfare, consistent with a public health perspective, which would emphasize population risk more than a single exposed individual's risk.

Four types of policies could benefit from a public health perspective for implementing the National Ambient Air Quality Standards.

1. *Reasonable further progress.* Reductions in atmospheric concentrations of volatile organic compounds or nitrogen oxides in different geographic areas are not equivalent. Differences result from the location of the emissions, the time of day they were emitted, the location of potentially exposed populations, and the effects that different volatile organic compounds can have on ozone.

2. *Cap and trade programs.* A nitrogen oxide trading market has been proposed, but it is not clear that an emissions-based program similar to the current sulfur dioxide trading program would be effective. An ambient-based program or exposure market might work better for nitrogen oxides.
3. *Alternative compliance.* Under this policy, a facility that is required to reduce its emissions can make reductions elsewhere if that is cheaper for it to achieve. In a public health context, the facility could be offered opportunities to make public-health improvements equivalent or greater than those that would have been achieved if the facility had met its emission reduction responsibilities.
4. *Clean air investment fund.* EPA made a proposal in its implementation plan that if a facility finds that NOX reduction will cost more than \$10,000 a ton, it can meet its responsibilities by paying \$10,000 into a fund. From a public health perspective, the fund manager would seek public health improvements equivalent to or greater than those that would have been attained with emission reductions.

Norm Anderson, Director of Research, American Lung Association of Maine, Augusta, ME, and Commission Member: Community-Level Experience

In some circumstances, an intended tradeoff to protect public health can be side-tracked. For example, the Lung Association, in cooperation with the Hospital Association, Maine Medical Association, and the Cancer and Heart Associations, supported an increase in the state cigarette tax as a way to fund smoking prevention programs. Maine, according to the CDC, has the highest young adult smoking rate in the nation. Unfortunately, Maine's Governor chose to use the money for general tax relief and the argument in favor of a public health investment was lost. Thus, politically effective public support for a public health approach is essential.

As to the ozone and particulate standards, one of the difficulties in crafting comparable health effect projects is our complete lack of a community-based asthma surveillance program. With the assistance of CDC, the Maine Lung Association has begun to collect information on the prevalence and severity of asthma at the local level. This community-level information will be critical in order to design investment projects that fairly address asthma health effects from ozone and particulate air pollution and measure benefits of any alternative programs of intervention.

A community public health infrastructure is needed. Maine had a better infrastructure 50 years ago, when tuberculosis was a major problem, than it does today. Today, most of the public health infrastructure is centralized at the state level. In collaboration with a number of local and statewide entities, the Maine Lung Association is developing community-based public health systems modeled after the Commission's Risk Management Framework. Stakeholders from the medical community, industry, and community groups will meet regularly to provide a forum for needs assessments, for identifying equity issues, and for understanding the different health and economic concerns of the stakeholders. The community health system will coordinate with the state and rely on the state for surveillance, research, and training.

Jason Grumet, Director, North East States for Coordinated Air Use Management, Washington, DC: The Urgent Need for Monitoring, with Federal Financial Support

Unfortunately, EPA's Office of Research and Development is now focused on basic research rather than

on assuring the reliability, accuracy, and consistency of the new monitoring program required for the identification of particulate accedence areas. Without federal support for generating good data, the bar is raised too high to expect implementation of a trading program. Moreover, no matter how good the science and the data may be, people are very sensitive to distributional equity. Unless the people who are being affected by the risks feel empowered to be part of the decisions about tradeoffs, alternative investments in public health will not be acceptable. There would be a tremendous benefit from having public health departments and regulatory agencies work together with communities to understand and make choices about how they want their resources deployed. There may be many preliminary steps required before cooperation can turn to such complex matters as proposed here.

Bringing public health back into the practice of environmental regulation makes sense. The rhetoric, logic, and basic purpose of environmental regulations are thoroughly grounded in the notion of improving public health. However, we have had very little ability to measure our accomplishments or connect them with our aspirations.

Chris Wiant, Director, National Association of City and County Health Officials and Fnvironmental Health Director, Jefferson County, CO: Risk Management at the Local Level

To evaluate ozone and particulate pollution and the tradeoffs of a public health improvement market, communities need a method for balancing the available information to establish the best long-term approach. The following aspirations should guide the management of environmental risks:

1. *Maximize risk reduction.* Eventually, a point of diminishing returns may be reached, whereby it takes 80% of the resources to reduce the last 20% of the risk.
2. *Aim for primary prevention, not just pollution control.* It is unlikely that all of the particulate pollution can be eliminated, but the goal should aim towards prevention through process change, not just implementing the best available control technology on emissions, generating wastes in other media.
3. *Seek incremental, continuous improvements in population-based protection.*
4. *Take a multimedia perspective.* It is difficult to consider public health in the context of ozone and particulate air pollution without considering air, land, water, and the indoor environment. The individual media focus is a legislative constraint that is not always helpful. It is at the point of diminishing returns that a community can begin to look at risk issues in a broader context. The community will want to know the relationship among their other public health needs, such as immunizations, prenatal care, and nutrition programs. This is the point at which community vision and perception may conflict with national priorities.

When allocating resources to address various risks, a community should look at the following aspects of each risk:

1. How good is the science regarding the health effects of concern? What level of confidence can be placed in the available information about the dose-response relationship and the mechanism of action?
2. Where is the community on the continuum of exposure and occurrence?
3. What are the available intervention methods? Can exposure be prevented through some pollution prevention technology like product substitution?
4. What is the consensus on the relative importance of that risk in the community?

This risk management model provides an approach to balancing the available information in order to establish the best long-term approach to risk reduction. It allows communities to allocate resources based on need. For example, resources could be needed to implement control technology to reduce ambient pollutant concentrations, such as putting controls into smokestacks, water treatment plants, or motor vehicles. In many cases, the greatest need will be community education or risk communication, which could involve helping the community to identify and assess public health issues, understanding the community's vision of public health goals, providing information and education, and working with the community to establish priorities.

Patrick Rahrer, Partner, Hogan & Hartson, Washington, DC: Gaining Public Understanding and Public Support for Risk-Based Tradeoffs

In analyzing a public health approach to ozone and particulate pollution, remember that there was a reason for taking environmental problems and their health effects out of the purview of the public health service and creating a separate agency. Health risks from water pollution and air pollution pale in comparison to the risks of heart disease or other health effects from smoking. Thus, it is acceptable to discuss tradeoffs among environmental health effects but not to trade environmental health effects against major public health problems like cigarette smoking. There are no legal barriers to trading among environmental health effects. The question is whether society will support the concept.

In the clean air program, bubbles, banking, and netting were created without specific authorization in the Clean Air Act. Under the Clean Water Act, there is no mention of trading, risk analysis, or offsets. Yet, the President of the United States made trading available under the Clean Water Act in March, 1995. The Clean Air Act allows Administrator Browner great discretion. So it is not a question of legal authority but a question of public support. Gaining support for a public health investment market will take exceptional skill in an area where we are very weak - risk communication.

In designing a trading program, basic rules for gaining public support include:

1. Whatever trade is made cannot make the situation worse. Perhaps ozone and particulate concentrations cannot be lowered enough to reach the standards, but there shouldn't be any increase in pollution.
2. Creating an equivalent public health improvement is a public decision.
3. Trades have to be contemporary and geographically related.
4. The public wants environmental protection as a "right," but doesn't want to pay for it, or at least, doesn't want to pay much. The public generally fails to recognize the costs businesses pass on to consumers.

Utility rates may be a particularly fertile ground for public discussions of risks and tradeoffs. The restructuring of the electricity generating system in the U.S. will test the public's expectations. We are on the verge of restructuring the largest industry in the country in terms of air pollution, and we are ignoring its public health impacts. Under the current restructuring proposals, the oldest facilities with the highest emissions will be run the hardest because they make the cheapest electricity. While the price of electricity will go down, the risks to human health will go up. At \$500 to \$1,000 per ton, these are the cheapest reductions in air pollution that we can make. One estimate is that we could buy significant public health protection with a 6% reduction in price rather than pushing for a 7% reduction. Right now, no one is making the case for that public health investment. This topic deserves prompt highlighting.

It is when broad-based national environmental protections are taken away, to which people perceive they have a basic right, that the lawyers are called in. The law does not prohibit us from implementing a public health investment market, but the law can be used as a roadblock.

Martin Reape, Director of Corporate Health Sciences, FMC Corporation, Philadelphia, PA: A Corporate View of Community Involvement

Our corporation focuses on occupational health. Trying to impact the health of workers' families forces a broader look at public health. Public health factors to consider in these contexts include the seriousness of the condition, frequency of occurrence, measurability, and ability to intervene. Because of the great uncertainty associated with identifying the effects of low exposure levels and with extrapolating from laboratory animals to humans, it is important to involve the community in looking at the bigger picture. In the case of ozone pollution, the community is the primary stakeholder and must examine multiple options, such as the number of cars coming into the city and the transportation of materials from one place to another. Alternative public health investments might be child health care centers, asthma treatment centers, and asthma research, particularly on sensitization and other causal factors.

Conclusions

1. A firmer base in public health principles and practices is necessary for effective control of current and future environmental threats.
2. The decrease in available resources, including funds and personnel, for state and local public health activities has had a significant negative impact on the ability to provide environmental public health responses to public concerns. The relatively insignificant amount of federal support for HHS-related environmental agencies, coupled with the command-and-control tendencies of regulatory agencies, has weakened the ability of the federal government to act effectively in a public health mode.
3. Public health professionals have generally failed to understand their responsibilities and opportunities in the area of environmental health, highlighting the importance of training public health professionals in environmental health and of training environmental protection professionals in public health.
4. A holistic approach including physical, social, and cultural aspects is central to the public health approach to the environment.
5. Primary prevention, particularly in vulnerable populations, is important. The precautionary principle is a valuable primary prevention approach, to be combined with scientific and technical research, to determine whether, in fact, the precautionary action has been warranted and has achieved the desired result. The Commission's Framework shows this key role of evaluation.
6. There is a clear need for data, including mode of action and mechanistic data, to develop a risk-based approach for primary prevention. Undoubtedly, a major gain in environmental protection has been that chemicals with significant potential for adverse impact have not been added to our society after initial toxicity testing.
7. Achieving sustainability will require the development of environmental indicators that accurately reflect common goals. Indirect metrics, while often useful surrogates, can be misleading when they reflect emissions or other intermediate steps rather than the public health impacts of concern.
8. A public health investment market is possible. Public support and community involvement will be necessary for the market to function. There must be flexibility for a community to look at its

particular context and public health needs. Tradeoffs should focus on trading among environmental health risks, not between environmental health risks and other public health risks. Trades must be contemporary, in the same geographic areas, and respectful of equity across population groups and tribal nations.

9. The lack of environmental health involvement in the current restructuring of the nation's electric power industry to minimize consumer rates is likely to pose harm to the environment. Attention to this matter by the Administration, state and local health officials, Congress, and the media is needed.

References

Burke, T.A. and N.M. Shalauta. 1997. Pilot Multi-Media Environmental Health Characterization Study of South and Southwest Philadelphia. Submitted to U.S. Environmental Protection Agency Region III by Johns Hopkins University, Baltimore, MD

Commission on Risk Assessment and Risk Management. 1997. Framework for Environmental Health Risk Management. Final Report Volume 1. Washington, DC

Commission on Risk Assessment and Risk Management. 1997. Risk Assessment and Risk Management in Regulatory Decision-Making. Final Report Volume 2. Washington, DC

Goldstein, B.D. 1995. The Need to Restore the Public Health Base for Environmental Control Commentary. American Journal of Public Health 85:481-483

Knopman, D. 1997. Local Public Health Improvement Markets, A Tool to Increase Public Health Benefits from Environmental Regulation. PPI Backgrounder. Washington, DC

Omenn, G. S. 1996. Putting Environmental Risks in a Public Health Context. Public Health Reports. Vol. 111:514-516

Appendix: Meeting Agenda

Symposium To Define A Public Health Approach To Environmental Protection

Date: 8 August 1997

Time: 10 am-4:30 pm

Place: Kimball Conference Center, 1400 16th St., NW, Washington. DC

Schedule

10:00-

10:15 **Welcoming and introductory remarks**

Gilbert S. Omenn, Chair of Commission and Dean of School of Public Health,
University of Washington

Debra Knopman, Director, Center for Innovation and the Environment, Progressive
Foundation

Bernard Goldstein, Member of Commission and Director of the Environmental and
Occupational

Health Sciences Institute, Robert Wood Johnson Medical School and Rutgers
University

10:15-

12:30 **Panel 1: Advantages and disadvantages of a public health approach**

Moderator: Gil Omenn

Dick Jackson, Director, National Center for Environmental Health, Center for Disease
Control and Prevention

Lynn Goldman, Assistant Administrator, Office of Prevention, Pesticides and Toxic
Substances, U.S. EPA

Devra Davis, Director, Program in Health, Environment, and Development, World
Resources Institute

Barry Levy, President, American Public Health Association

Thomas Burke, Associate Professor, Johns Hopkins School of Public Health

12:30-1:30 Lunch

1:30-3:00 **Panel 2: Investing in public health improvements: Ozone and particulate NAAQS**

Moderator: Debra Knopman

Alan Krupnick, Fellow, Resources for the Future

Norm Anderson, Member of Commission and Director of Research, American Lung Association

Chris Wiant, Director, Tri-County Health Department, Engelwood, CO Representing National Association of County and City Health Officials

Patrick Raher, Partner, Hogan and Hartson

Martin Reape, Director of Corporate Health Sciences, FMC Corporation

Jason Grumet, Executive Director, North East States for Coordinated Air Use Management

3:00-3:15 Break

3:15-4:30 **Wrap-up: commentary from other Commissioners, conclusions, recommendations, next steps**

Moderator: Bernard Goldstein

Posted September 26, 1997