Science and Politics: A Balancing Act for Environmental Health Policy

Developing standards to protect the public's health against environmental hazards—pesticides, for instance, or air pollutants—is like a high-wire act. First, there's the delicate, often-contentious process of balancing science and politics. On the next level, there's also the need to maintain an equilibrium between two affected interests: consumer health groups, which may want regulations that err on the side of safety, even before all the hard facts are in, and the industry involved, which may argue for waiting until there's overwhelming scientific evidence of a health risk before subjecting it to often-costly regulations.

That's where legislators and regulators—whose job it is to juggle the interests of scientists, regulated industries and public interest groups and, at the same time, to assess the potential economic and health effects of a particular regulation—get into the act. The overarching goal: to craft policies that reflect the most reasonable balance between acceptable risk, cost and benefits.

Complicating the problem, however, is the lack of an understanding of science on the part of most policymakers. Confronted with dramatically conflicting testimony on basic scientific facts, noted Ken Olden, director of the National Institute of Environmental Health Sciences, legislators “often are put in the position of choosing between extreme points of view rather than making decisions based on objective and rigorous evaluation.”

Because “it is highly unlikely we will ever have all the information we'd like to have [before writing] a regulation or establishing public health policy, virtually all decisions must be made in the face of some uncertainty,” Olden conceded. Even so, “it is imperative that we use all the relevant scientific information available and that we clearly articulate the uncertainty that surrounds any regulatory decision.” As for groups requesting more science as a delaying tactic, that is “unacceptable,” he said. “We have to have the courage to act when information is available that the potential risks outweigh the benefits [of not acting].”

DEFINING ‘SCIENCE’

The length of time and the degree of uncertainty involved in conducting environmental health research leave ample room for disagreement about the soundness of the science upon which regulations and policy are based. While science is based primarily on facts gathered from studies and technical investigations, policy tends to be value-based, incorporating the views of the public, industry and other special interests. Between the two lies the process of risk assessment, which interprets available scientific data on a particular substance, looks at possible human exposures to it and decides what potential harm it may pose to the general public or to specific subgroups, like children.

But even there, problems arise. Because decisions on risk often must be made before all the science is in, risk assessors must choose from a wide range of possibilities, leaving open the debate over the health risks and benefits and the financial impact of the regulation in question.

Critics of the current process contend that regulations are not always the result of sound science but rather of “politicized science”—that is, findings by ‘fringe’ scientists who will mold their research and interpret results in a way that pleases their financial backers.

The problem is that legislators and the general public are mostly nonscientists and so have trouble judging the quality of the information given them. “The definition of ‘sound science’ for someone involved in this process is usually the science that you agree with,” said Minnesota Rep. Phyllis Kahn, who helped develop the Council of State Governments’ report, A State Official’s Guide to Sound Science. Kahn, who holds a Ph.D. in biophysics, said that while both sides of a debate may claim the research that supports their view is sound while the opposition’s is based on ‘junk science,’ there are ways to find out for oneself, without having an advanced degree.

Kahn gives some advice on sorting out good science from bad. Sound science characteristics are: 1) a credible source; 2) use of documented methodologies that produce verifiable results and conclusions; 3) a careful statement of cause and effect; 4) clear measurements and methodologies; 5) peer review and publication. Questionable science characteristics, meanwhile, are: 1) observer bias; 2) association with vested interests; 3) important variables overlooked or ignored; 4) inadequate sample size or biased sample collection; 5) conclusions that are based on personal or anecdotal evidence; 6) statements of certainty; and 7) correlation confused with cause and effect.

F O O D  F I G H T :  T H E  F Q P A

The controversy surrounding the standards to implement the Food Quality Protection Act epitomizes the problem-filled interaction between science and politics. (Science & Politics, p.6)
Enacted by Congress in 1996, the act among other things requires the Environmental Protection Agency (EPA) to review the use of pesticides and to ensure that children are adequately protected from any exposures they may receive through their diets. From there, the debate breaks down into one over the safety of the food supply versus the cost of compliance.

In a May 1999 letter to EPA, nine national children’s education, public health and environmental organizations urged the agency to apply “an additional default margin of safety to its pesticide assessments to protect kids” as the law stipulates, by requiring “developmental neurotoxicity tests” on 350 products registered for use on food crops. At the time, the letter noted, EPA had completed the tests for only nine of those pesticides. (Under the timetable established by Congress, EPA has been given until 2006 to reassess its legal limits—“tolerances,” in official jargon—for specific pesticide residues in specific foods and determine whether the products will be allowed to stay on the market under the 1996 law.)

Stressing the importance of implementation of “the first health-based standard for regulating pesticides,” Routt Regart, M.D., chairman of the advisory board of directors for the Children’s Environmental Health Network—one of the letter’s cosigners—said the law provides that a pesticide is not considered safe for use until there is “reasonable certainty of no harm.” That approach appeals to the public health community because it puts the burden on pesticide manufactures to prove that their products are safe, rather than requiring government to prove that they are unsafe.

Within the food industry, however, there are concerns that EPA’s actions may create unjustified anxiety about safety issues. “Americans enjoy the safest and most affordable food supply in the world,” said Brian Folkerts of the National Food Processors Association. It was safe before the Food Quality Protection Act became law, “and it remains safe today.” The food industry “will abide by EPA’s decisions,” Folkerts said, but the agency “needs to ensure the scientific integrity of those decisions.”

For at least six states (Georgia, Kansas, Michigan, Missouri, Pennsylvania and Wyoming) there is also concern about the scientific basis for the EPA-issued standards. In response, the six passed resolutions in 1998 and 1999 urging the agency to use sound science, make no decisions unless adequate data are available and avoid actions that will have an adverse economic impact when considering new pesticide tolerances.

Sen. George M. Manu, who sponsored the resolution in Michigan, said legislators “are asking that EPA base regulations on science rather than politics when setting [pesticide] tolerances.” The agricultural industry, he noted, “rests heavily on pesticides and it is expensive to develop new ones. Also, alternatives are not available for some pesticides to control certain pests.” The new regulations, he said, are a result of what he termed “political motivations” within EPA. “It is a matter of extremes and how safe is safe. We need to operate under factual conditions.”

In support of EPA, Olden said that while laws like the Food Quality Protection Act and the Clean Air Act are appropriately strong, “regulatory agencies are in the unfortunate situation of not having an adequate scientific foundation” to implement them. “We have to develop the science base to allow the [laws] to have the impact that Congress intended,” he said. “We also need to identify key knowledge gaps and stimulate research to address those gaps” so that future decisions will be more informed.

To ensure that sound science doesn’t take a back seat to political maneuvering, Kahn suggested calling on “good scientists who are willing to act in the public policy domain and on policy people with scientific understanding or training.” It is important, she concluded, that policymakers agree on basic facts. “From there they can discuss policies that most effectively deal with the problem.”

THE IMPACT OF GENETICS

The emerging field of genetics holds promise of providing a stronger basis for sound science and in the process, lessening the debate over health-based environmental standards. In the coming years, genetic research will help scientists more accurately identify the number of individuals who may benefit from regulatory action, which in turn will aid in the writing of better regulations.

To that end, the National Institute of Environmental Health Sciences is working on the Environmental Genome Project (not connected with the Department of Energy’s Human Genome Project), which is aimed at identifying genes that determine susceptibility to environmental diseases. Although current research is based on ‘the average person,’ genetics tells us there is no such thing, and gene identification and subsequent research will help tailor policies that protect sensitive individuals at potentially lower regulatory costs.

William Suk, deputy director of the project, said that now, regulations “are based on homogeneous populations and do not take susceptibility into account.” That is fine for the general population, he said, “but not for the individual who suffers.” Given the tremendous uncertainties related to standard-setting, “it is difficult to determine whether we are under- or overregulating and whether we are adequately protecting public health.” More information about genetic susceptibility would make risk assessment more accurate and individualized, Suk said.

The ultimate goal, he concluded, “is to get the sound science necessary to make good regulations.”
In a political career that spanned more than three decades, Connecticut's Lowell Weicker Jr. held an impressive list of titles: state representative (1962-68); mayor of Greenwich (1963-67); U.S. Congressman (1968-70); U.S. Senator (1970-88); and governor (1991-95). Among his endeavors since moving to the private sector, Weicker is chairman of the Pew Environmental Health Commission, an independent panel of experts whose mission is to strengthen the nation's ability to track and prevent health problems linked to environmental conditions. In an interview, Weicker talked about the work of the commission, which was launched last May, and the need to buoy up the public health infrastructure.

Q: What is the rational behind the Pew Environmental Health Commission?

A: For a long time, we've had a lot of anecdotal "science" on links between the environment and various ailments. In the Pew study, we're trying to bring a more precise and scientific approach to the problem. That doesn't mean we'll establish definite links between substances in the environment and disease, but we can start to focus on discoveries that will be made in the future if enough resources and discipline are brought to the task.

The core staff was recruited from the Johns Hopkins University School of Public Health, and the commission itself, present company excepted, is "blue ribbon," very broad-based in the disciplines represented—health, science, government. We all feel there's one thing wrong in the present structure of health in the U.S., [and that is], there is not enough emphasis on public health. The focus that used to exist in the Office of the Surgeon General has been dispersed among many agencies and so can be rather fragmented in terms of the information unearthed and used. We're trying to bring a discipline to the big question: what are the links between the environment and matters of health, whether cancer, birth defects or childhood asthma?

Q: What sorts of projects is the commission undertaking?

A: [Our first study, released last November, was on] birth defects. Next will be childhood asthma and cancer and tracking. If you don't have a tracking base, the results helpful in terms of the allocation of resources to public health. Eventually, though, we are going to have to [answer the question], 'Do we really give a damn about the environment? Do we accept it the way it is, the diseases that go along with it, or do we do something about it?' There's going to be a tradeoff if some things we do are indeed found to be harmful. Are we willing to change our lifestyles to diminish susceptibility to disease? That decision has to be made at the federal level.

Q: Will you make recommendations? If so are there resources to back them up?

A: We made up our minds at the beginning that we weren't going through an exercise to have a study that sits on a shelf, that we were going to make specific recommendations as to who should be involved and what they should be doing. Granted, we're not going to be able to give precise answers as to what causes what, but that will be ongoing with other commissions and agencies, both state and federal. We're trying to focus the country on the fact that we have to pay attention to the possibility that the environment determines much of the illness around us.

As for resources, not really. The Pew Foundation is big, but... What we want to do is give [the research base] support to gain the funds necessary to do the job.

Q: How do you get the public's attention focused on the problem?

A: The first big "advertisement" [for environmental health issues] as such came in the book and the movie A Civil Action (profiling a Massachusetts town plagued by an unexplained high incidence in leukemia). That was the first time something was put in lay terms that there might be a link between the environment and a cluster of disease. Then comes this commission, the next boot in the tail, and then comes President Clinton's budget, which focuses monetarily on the problem.

But building interest is difficult, because as soon as you say 'environment,' people think you're talking about snail darters and turn off. What we're talking about is the environment and people's health. That's a different story, and to me, it's well worth our interest and our money.
Scorecard of State Birth Defects* Surveillance Programs

STATE GRADES

A: AR, CA, GA, HI, IA, MA, OK, TX
B: AK, AL, AZ, CO, FL, IL, KY, ME, NE, NJ, NM, NY, SC, UT, VA
C: CT, DE, KS, MD, MI, MO, NC, TN, WV, WI
F: ID, IN, LA, MN, MS, MT, NV, NH, ND, OH, OR, PA, RI, SD, VT, WA, WY plus the District of Columbia and Puerto Rico

*Birth defects include: preterm birth and low birthweight; cerebral palsy, mental retardation and autism

Criteria for Grading State Birth Defects Tracking Systems

TYPE OF TRACKING

Active: case investigators search out records
Passive: a report is filed to the government for tracking
Comprehensive: statewide plus all birth defects as defined by CDC
(Note: States receiving a grade of “F” have no tracking system currently in place.)

Fetal deaths: includes deaths of developing babies of at least 500 grams and 20 weeks of age
Timeliness: produces & releases data in reasonable amount of time
Analytic capability: state analyzes its own data

Source: The Pew Environmental Health Commission