



Testimony on Comparative Risk Assessment (CRA)

Testimony Prepared for Presentation to
Committee on Environment & Public Works
U.S. Senate
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I am pleased and honored to be able to share with the committee my views on the important subject of comparative risk assessment. My views are only that and do not represent the institutional position of Resources for the Future (RFF). RFF is a research institution that does not take positions on policy issues.

Comparative risk assessment (CRA) is an important analytical tool that deserves the attention this committee is giving it. The fundamental goal of most of our environmental programs is to reduce or prevent risk. Thus, identifying and comparing risks is a logical starting point for evaluating progress and identifying future directions and priorities.

There are, however, important limitations inherent in the use of CRA. Most importantly, we have no common metric to deal with the many diverse kinds of risk that government addresses. When I was at EPA we referred to this as the "how many whales is your grandmother worth" problem. How do we weigh the risk of pesticide poisoning of trout streams to the risk of causing cancer in humans? How do we compare the risk of cancer to the risk of long-term neurological damage? How do we compare one type of cancer to another?

There are answers that can be given to these questions, but the answers are heavily dependent on values. Even if scientific understanding were perfect and data were complete and accurate, the value elements inherent in CRA would prevent CRA from ever being a purely scientific undertaking. The science and the data in most cases are woefully incomplete, and this adds further elements of uncertainty and value judgment to CRA.

Different Types of CRA

There are different kinds of CRA, and some distinctions are important. In particular, there is a basic difference between comparing individual pollutants or activities and comparing programs. Comparing mercury to lead is very different from comparing air pollution to water pollution. This hearing is focusing primarily on the latter, on programmatic CRA, and it's important to keep this in mind.

More generally, the type of CRA undertaken, and the process used to make the comparisons, should depend on the purpose for which the CRA is being done. Doing a CRA to establish research priorities involves different considerations than CRA to establish enforcement priorities.

Uses of CRA

- CRA serves a variety of different purposes. Among the more important:
- CRA serves to focus people on the question of what are the benefits of a program or action, what are we getting for the resources expended. In this sense, CRA and the Government Performance and Results Act (GPRA) serve the same beneficial purpose.
 - CRA can be a starting point for setting budgetary and other priorities. In a recent evaluation of pollution control efforts in the United States, I questioned whether EPA priorities were in line with risk considerations, given that most of the risks identified as highest in CRA analyses ranked lowest in EPA budget expenditures. However, such comparisons of risk rankings to budget expenditures are useful only in a broad sense. There are other important factors, aside from risk, that should and do enter into budgetary priorities.
 - CRA can serve to identify neglected problems. Indoor radon is a good example of a problem where analyzing the risks highlighted an environmental problem that was receiving little attention. David Konisky at RFF has recently completed an [analysis of all the CRA efforts undertaken to date](#) in the United States, and his analysis shows how some neglected problems have surfaced. With your permission, I would like to submit this paper for the record. (Click here for [Comparative Risk Projects: A Methodology for Cross-Project Analysis of Human Health Risk Rankings by David M. Konisky, RFF Discussion Paper 99-46.](#))

- CRA, like all good analysis, can make the assumptions behind decisions more transparent. These may be assumptions as to why something was not done as well as to why something was. We all know the very high risk of cigarette smoking. Documenting the high risk encourages us to ask why more action is not taken and what alternative courses of action are available.
- CRA helps to identify needed data. Very often, in the process of asking about relative risks, we discover we do not have the data necessary to answer the question. For example, of the 80,000–100,000 chemicals in commercial use, we have adequate toxicity information about only a few hundred.
- CRA can catalyze and mobilize opinion so that action can be taken. CRA, especially at the state or local level, can be a way of getting people to agree on an agenda for action and then to act. Arguably, most of the recent state CRAs have been as much about political mobilization as about risk analysis.

Limitations of CRA

As I noted at the beginning of my testimony, the assumptions and values that unavoidably enter into both risk assessment and CRA are a major consideration. Risk assessment is an odd mixture of science and nonscience, and CRA necessarily suffers from all of the limitations of risk assessment.

CRA suffers from additional methodological problems. For example, how should the risk-reduction effect of current efforts be considered? If there were no public programs to protect drinking water in this country, drinking water would rank among the highest risks, as it does in many developing countries. However, because there are protection programs, the current risks from drinking water in the U.S. are not great. In the context of budgeting, for example, this poses difficulties for CRA. We cannot do zero-based budgeting if the analysis of risks assumes current levels of spending.

Most importantly, CRA deals only with risk, and risk is only one of several factors that should enter into most government decisions. Cost is an obvious other factor. To the extent that decisions should be based on cost-benefit analysis, risk gives only the benefit side of the equation. Furthermore, you cannot do a cost-benefit analysis of a problem, only of a solution. Whereas CRA deals with problems, cost-benefit deals with solutions.

So getting from one type of analysis to the other is not simple because the two types of analysis are analyzing two different sets of things.

Aside from risks and costs, public decisionmakers need to consider such things as due process, administrative feasibility, legality, and political support. No one has yet developed an analytical method for putting together all these factors.

Two other limitations of CRA should be noted. First, how the CRA is done can have an important effect on its outcome. Konisky's paper shows that how broadly the categories are defined (e.g., particular pollutants vs. outdoor air pollution vs. all air pollution) can make a big difference in the resulting risk ranking. Second, how and when to involve the public in the process poses a variety of questions. The value aspects of CRA mean that the public should play a key role. However, this raises problems of how to incorporate technical and scientific information. Granger Morgan at Carnegie-Mellon University and others are conducting interesting experiments on this question.

The Statutory Context

Congress has given EPA only limited flexibility. With approximately 1,000 pages of legally binding guidance, there are only a few choices left to the Air Office, for example. No amount of analysis will change the basic agenda of EPA, which is set by the environmental statutes.

Many, arguably most, provisions of EPA's laws are not based on risk. For example, most of the standards in the Clean Water Act are technology-based standards, so analysis of risk is, at least in theory, irrelevant to setting these standards. Even where Congress has employed risk-based standard setting, as with the National Ambient Air Quality Standards (NAAQS), the scientific basis is sometimes deficient or outdated. The statutory language on NAAQS assumes a risk threshold (a level below which there is no risk) whereas we have understood for more than a decade that there is no threshold for most of the criteria pollutants. It is difficult to use good science to make decisions if the relevant statutory provisions do not allow good science to be used.

The fragmented, medium-based (air, water, soil) nature of the pollution control laws, programs, and budgets also hinders the use of CRA. Most risks cut across media lines, so the scientific data about risk do not follow the budgetary or program categories.

The risks of arsenic are within the purview of the air office, the water office, and the office of solid waste. Nitrogen poses risks in air, water, and soil. Climate change is an air problem, a water problem, and a land problem. The United States is one of the last industrialized countries to cling to a nonintegrated pollution control system, and difficulty in using risk information is one of the penalties we pay.

Conclusions

Despite its limitations, CRA is a valuable analytical tool. It may be most useful for the questions it raises and as a way of initiating a process leading to more transparent and defensible decisionmaking. How well it serves these functions will depend heavily on whether Congress itself asks for relevant risk information and uses the answers in its budgetary, oversight, and legislative actions.