

CHAPTER 7

The Best Science, Values, and the Precautionary Principle to Protect Children

Environmental regulations have saved many children and their families from much unnecessary suffering. Mercury is no longer discarded from factories in industrialized countries the way it was at Minamata. PCBs have been phased out. Lead is no longer added to U.S. or European gasoline and paint. Better regulations apply to new dumps in which toxic chemicals are discarded. At the same time, the scourge of pollution victimizes almost every child in one way or another. There are serious social inequities regarding whose children are most affected. Children continue to be harmed by lead, mercury, PCBs and pesticides, and noise. Toxic chemical dumps are still leaking into people's homes, long-lived radionuclides contaminate some areas heavily, and the planet's food chain is still bioconcentrating pollutants such as mercury, PCBs, and PBDEs in remote areas such as the Arctic and in industrialized areas.

The best science by itself cannot solve the pollution problems we face today. And science cannot prevent problems in the future. Science by itself does not make environmental policy. Ethical and value considerations are central to policy. The best science, no matter how good it is, will always involve uncertainty, interpretation, and arguments among scientists. Whether the scientific uncertainties and arguments should delay policies to protect the public is a matter of one's moral values.

The Precautionary Principle was proposed in its basic form at least as early as the Surgeon General's 1925 conference on tetraethyl lead. It was reiterated in 1936 in the meeting over PCBs. But policy is still not precautionary. To be precautionary in a rational way requires careful consideration of the value judgments that are embedded in the scientific research, risk assessments, and benefit-cost analyses. Before we consider the Precautionary Principle in detail, let's recap what we have learned about how pollution affects children's behavioral development.

What We Know about How the Pollutants Affect Children

The research shows that virtually all children are exposed to many kinds of pollution that can harm their development and overall quality of life. Many of these pollutants are in the food chain. Research on lead, mercury, PCBs, and noise has produced the most evidence that children's intellectual development and behavioral functioning are being harmed. The effects of pesticides (OP and carbamate) and low-level radioactivity on psychological development have not been well studied. But there is a logical chain of evidence that they can alter early brain development and later functioning too. The psychological stresses of pollution disasters can have long-lasting effects on families and communities. For the latter hazards to children's development, the scientists will continue their arguments about what level of exposure produces what magnitude of negative effects, and whether there are alternative explanations of the results. Scientists will also continue to study the exact developmental processes that are altered by exposure to a toxic substance, whether there is a sensitive period during development when a fetus or child is most susceptible to exposure, how combinations of toxic substances affect development, and what other factors in the child's home and school environment or genetics of the child might exacerbate or ameliorate the effects of pollutants.

How serious are the pollutants discussed in this book? The pollutants that I chose to write about are those for which there is at least some good research on behavioral and psychological effects. That fact does not necessarily imply that they have worse effects on children than other pollutants. I have included physical health effects only in passing. The pollutants described in this book came to the attention of public health officials because of some extraordinary events—children killed by lead poisoning, methylmercury disasters in Minamata and Iraq, PCB poisonings in Japan and Taiwan, public complaints and lawsuits over airport noise, pesticide poisoning incidents, nuclear accidents, and blatantly leaking toxic waste dumps.

These pollutants are a public health concern because virtually all children are exposed to them to some extent, whether they live in industrialized countries or in remote areas. The magnitude of any public health issue depends on the size of the population that is exposed. Even if there is only a 1 in 1,000 chance that a child will be harmed by prenatal exposure to a toxic substance, if 1 million children are exposed, then we would expect 1,000 children to suffer negative effects. Whether it is worthwhile to save those 1,000 children depends on one's moral values. Because children cannot protect themselves, we give them extra legal protection in our society. Children are "captive riders" who must go along with whatever their families and the society around them decide. Protecting children from pollution is plainly a moral choice.