

MODULE 7

Ethical Issues in Environmental and Occupational Health

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Issue Essay

US physicist Alvin Weinberg (1988) claims that today's environmental-health problems are relatively trivial. Although many aspects of human well being are influenced by the environment, Weinberg says that environmental-health problems (such as liquid and airborne wastes, stresses in the workplace, and unsafe food) are sensationalized by the hypochondria of laypeople. Weinberg believes that these contemporary hypochondriacs are driven by an hysteria analogous to the irrationality that drove fourteenth- and fifteenth-century witch hunts. Just as people eventually learned that witches did not cause misfortunes, Weinberg claims that the public must learn that various environmental problems do not cause the public-health problems often attributed to them. He says the public needs to come to its senses, just as those who killed more than a million alleged witches eventually came to their senses.

Public-interest activist and attorney Ralph Nader, however, thinks Weinberg is wrong (Nader 2000). He believes that many of today's public-health problems are substantial, increasing, and largely environmentally induced. The culprit behind this "corporate cancer," Nader believes, is the profit motive. Labor leader Sheldon Samuels (1988) agrees with Nader and claims that workplace health problems are increasing, largely because of an "industrial cannibalism," industries' killing their own workers in order to save money on pollution control.

Background

Who is right about environmental-health threats, the Alvin Weinbergs or the Ralph Naders of the world? Are environmental-health risks minimal, but fueled by public ignorance and hypochondria? Or are environmental-health risks massive, but covered up by vested interests attempting to reduce manufacturing costs? To answer these questions, it is important to examine environmental-health problems faced by at least three distinct groups--workers, the public, and the poor or members of minority groups.

Medical doctors long have realized that workers face special public-health threats as a consequence of workplace exposure to various environmental hazards. In 1472 a German booklet warned goldsmiths how to avoid poisoning by mercury and lead. And in 1556, the mineralogist Agricola wrote the first known review of miners' health problems. He noted that some women who lived near the mines of the Carpathian Mountains in Eastern Europe had lost seven successive husbands to mine-related accidents and diseases. Pleading with employers to make workplaces safer, in 1700 Italian physician Ramazzini wrote *Diseases of Workers* (Shrader-Frechette 2002, ch. 7).

More than two centuries ago, Percival Pott linked coal tars to the scrotal cancer that killed young chimney sweeps in England. Yet today thousands of coke-oven workers in steel mills around the world continue to inhale the same deadly substances, and they are dying of cancer at 10 times the rate of other

steel workers (Leigh 1995). Even in nations like the US, annual occupation-related deaths are approximately five times greater than those caused by the illegal drug trade and approximately four times greater than those caused by AIDS (Leigh 1995). A later case study will examine whether occupational health is getting better or worse and whether the current state of occupational health raises any important ethical issues, such as consent to higher workplace risks, that ought to be addressed.

In the area of public health, obviously environmental threats are being reduced, as compared to several centuries ago. In the middle 1800s communities in most nations established Departments of Public Health to monitor and regulate the health effects from environmental contamination such as polluted water. While progress in environmental health is obvious, it is less clear that some areas of environmental health are improving. For example, the World Health Organization claims that pesticide poisonings, especially in developing nations, annually cause about 50,000 deaths (Matthews *et al.* 1986). And the US Office of Technology Assessment asserts that up to 90 percent of all cancers are “environmentally induced and theoretically preventable” (Lashoff *et al.* 1981, pp. 3, 6 ff.). Experts agree that roughly one third of all cancers are caused by cigarette smoking (National Cancer Institute 1994), but they disagree about the causes of the remaining cancers. Some say a major culprit is industrial pollution, given that the cancer rate tends to track the rate of industrialization throughout the world (Epstein 1998; Walker 1998). Others say the greater culprit is lifestyle, such as eating too much fat, while still other medical experts say the predominant cause of cancer is genetic (Ames and Gold 2000). They point to the BRCA1 and BRCA2 genes thought responsible for 5 to 10 percent of all breast cancers. Whoever is right, the stakes are high. According to the National Institutes of Health, more Americans die each year from environmentally induced cancer than from murder. Cancer incidence in the US is increasing six times faster than overall cancer mortality is decreasing (National Institutes of Health 2000). A later case study will examine whether the cancer rate can be attributed, in large part, to environmental factors and whether there are ethical grounds, such as the right to life, and the right to equal protection, for additional investigation and regulation of these factors.

The environmental health of minorities and poor people is perhaps even more problematic than that of either workers or the public generally. A recent article (Navarro 1990) in *Lancet* pointed out that on average whites live 6 years longer than African-Americans in the US. The essay also noted that, for most causes of death, the mortality differentials between the two groups is increasing, not decreasing. Even worse, the article charged, is that the US is the only western developed nation whose government does not collect mortality statistics by class, that is, by income and education. When the author looked at class-based mortality data for the only diseases (heart and cerebrovascular ailments) on which the US government collects class-related information, the class data showed an even wider disparity than the race data. If the author is correct, then the public health of poor and minorities is getting worse and may point to crucial inequities in society. A later case study will examine allegations of greater numbers of environmentally-induced health threats among poor and minorities, that is, instances of alleged environmental racism or environmental injustice. It will also investigate whether there are ethical grounds for additional investigation and regulation of factors affecting the health of poor people and minorities.

State of the Debate

The current debate over environmental threats to occupational, public, and minority health focuses both on the scientific facts (the magnitude of health risk) and on the ethical issues associated with those

facts. Normative controversies concern both the *content* of the ethical principles that should govern policy and decisions about environmental health and the scientific and evaluation *methods* that are most ethically defensible. Conflicts over the content of ethical norms focus on issues such as (1) rights to know, (2) autonomy and free informed consent, (3) equality, especially equal protection from environmental-health risks, and (4) due process. Controversies over the methods appropriate to ethical evaluation of environmental health focus on (5) the burden of proof, (6) stakeholder representation in environmental-health decisions, and (7) the legitimacy of using risk assessment and benefit-cost analysis in ethical evaluation of environmental-health problems.

Debates over (1) rights to know particular environmental threats to public health usually pit commercial interests against medical interests. On the one side, market proponents, like advocates of the World Trade Organization, argue that requirement of full labeling of food products, for example, regarding the presence of possible pesticides or growth hormones, amounts to an infringement on free trade (Hoekman and Mattoo 2002). They also claim that such labels put some manufacturers (who use more pesticides or growth hormones, for example) at an unfair competitive advantage, relative to manufacturers who do not use the pesticides or hormones. On the other side, public-interest groups, like the nongovernmental organization (NGO), Public Citizen, argue that all consumers have the right to know exactly what they are purchasing (Wallach and Sforza 1999). They also maintain that even Adam Smith argued that markets could be free and competitive only if there were full information available to consumers.

With respect to (2) autonomy and free informed consent, often the debate focuses on what serves the common good, versus what serves some private good or an individual's right to self-determination. On the one hand, many people (like businessman Peter Drucker (1991)) maintain that allowing free informed consent to every potential victim of an environmental health threat would be extraordinarily inefficient and might even lessen economic progress and thus harm the common good. They say that if most residents had to give free informed consent to siting a polluting facility nearby, then very few needed facilities could ever be sited, and the consequences would be economically disastrous, would harm the common good.

On the other hand, medical ethicists, like Tom Beauchamp and James Childress (1994, pp. 142 ff.), point to the fact that, as a result of the Nuremberg Accords, it is not permissible to experiment on anyone without his consent, and involuntary exposure to pollution may amount to an experimentation on people and to a potential violation of their rights to life. Arguing for free informed consent, advocates also note that typically pollution can be reduced to a level according to which it is easy to obtain free informed consent of exposed people, but that often industry is unwilling to pay the costs of reducing pollution. In such cases, some ethicists argue for expanding regulations that might help guarantee free informed consent to environmental-health risks (Cranor 1994).

Controversies over (3) equality, especially equal protection against threats to environmental-health risks, typically focus on whether decisions about environmental health should aim to maximize overall welfare, as utilitarians might propose, or on whether they should aim to ensure equal treatment among people, as egalitarians claim. Those, like economist John Harsanyi, who would likely find nothing reprehensible about siting most hazardous waste dumps in consenting minority communities, for example, typically maintain that the overall welfare of such communities can be improved because of such decisions (Harsanyi 1975, pp. 594-600). They say that increased support for the local tax base and

growth in jobs, available at the dumps, could offset any alleged inequality in the imposition of environmental health risks. They note that a bloody loaf of bread is better than no loaf at all.

However, those who are worried about equal protection, like philosopher John Rawls (1971), maintain that any choice (about siting most dumps in consenting minority communities) is unethical if it forces people to jeopardize their health, relative to others, because of factors that are largely beyond their control. Such inequality in imposing environmental-health risks, say egalitarians, also is inequitable because people are not really free to reject it, if they are powerless politically and economically, or if they must jeopardize their health in exchange for other basic necessities of life. Moreover, egalitarians argue that because rights to life, and to equal protection from environmental-health threats, are necessary for the exercise of civil liberties and for fulfilling the conditions of human life, people ought not be forced to give up such rights and protections.

If people are put at risk by an environmental threat to their health, ethicists also are divided on the issue of (4) due process and what, if anything, they deserve as compensation. On the one hand, more utilitarian (those who maximize overall average welfare) thinkers, like physicist Harold Lewis (1990), maintain that if people were allowed to exercise their due-process rights and were able to sue every source of potential health problems, then many societal resources would be wasted in lawsuits, and overall societal good would not be served. Moreover, they say that the burden of environmental health threats already is spread rather evenly to citizens, and therefore no one is put substantially more at risk than others are. Therefore, they claim, no one really needs to be compensated or to have his due-process rights enforced in this area.

On the other hand, medical and public-interest groups, like Public Citizen, assert that environmental-health threats are not distributed equally. They say often such threats are covered up and are more serious than people believe; that when people are harmed, they have due-process rights to redress (such as compensation) under the law. Moreover, without such redress, they say those who threaten environmental health have no incentives to improve their modes of behavior (Wallach and Sforza 1999).

One important area of due-process concerns, related to environmental health, is that of US weapons production. Under US law, defense operations that cause harm to citizens are typically not threats concerning which citizens can seek compensation. Because of the doctrine of sovereign immunity, according to which one cannot sue the sovereign or government, citizens have no rights to seek court action to protect their due process rights that may be jeopardized by the US government or its contractors. Yet current (year 2001) estimated costs to clean up the weapons-production facilities in the US, where thousands of communities are endangered because of chemical and radiological pollution, are approximately a trillion dollars. And US military contractors, such as Raytheon, McDonnell-Douglas, Westinghouse, Bechtel, Martin Marietta, and so on, are typically held not liable, by US law, even for intentional violations of public- and environmental-health standards at the facilities they run (US GAO 1999).

On the one hand, the rationale for exempting government contractors from responsibility for violations of citizens' due-process rights, to seek redress from injury caused by defense operations, is national security. Proponents of exemption also charge that everyone benefits from national security and defense, so everyone must be willing to pay the price (US Congress 1999). In addition, they argue that the health costs of defense are borne fairly equitably, across regions of the nation.

On the other hand, opponents of military violations of public-health and environmental standards argue that something is wrong when US defense activities harm the very people they are designed to protect (Rush and Geiger 1997-1998). They also point out that the US defense establishment is, by far, the largest and most serious violator of US public-health and environmental standards, and that the US has to be held accountable, on grounds of fairness, for obedience to its own laws. Critics of those who want to hold the defense establishment not responsible for threats to citizens' due-process rights, also argue that failure to hold it responsible has caused many needless threats to public and environmental health. For example, the US could have tested all nuclear weapons below ground, instead of above ground, and it could have avoided hundreds of thousands of additional US cancers caused by above-ground weapons testing. Because of the absence of liability and due-process claims against the government, the critics note that the US pursued the cheaper path of above-ground testing, of not warning civilians to stay indoors after the tests, and of not testing the weapons on the east coast, so that the fallout could drift over the Atlantic, instead of over the US.

Just as there is great debate over the content of the norms (e.g., individual rights versus common good) that ought to govern environmental-health decision-making, as in cases of weapons testing, so also there is controversy over the methods appropriate to ethical evaluation of environmental health. Primary among these debates is the focus on (5) the burden of proof. On the one hand, attorneys like Sander Greenland (1991) argue that, given US law, people ought to be presumed innocent until proved guilty, and therefore the potential victim of an environmental-health threat ought to bear the burden of proof in establishing his injury. Otherwise, they say that many innocent people and groups would face the impossible obstacles of trying to prove their innocence.

On the other hand, philosophers like Carl Cranor (1994) argue that, because the damage from environmental-health threats is so great, and because it is so difficult and expensive to prove causality in such cases, therefore the burden of proof should be on the "deep pocket," the party with the most resources and the party least likely to be vulnerable. According to Cranor, this least-vulnerable party is the person or group causing potential environmental-health threats. Such conflicts over who should bear the burden of proof in environmental-health disputes focus mainly on the common good, on equal treatment, and on fairness.

In debates over ethical strategies for decisions about environmental-health threats, many conflicts arise over (6) the necessity of stakeholder representation. (Stakeholders are those who stand to gain or lose as a result of particular environmental health threats. Often stakeholders are primarily potential public-health victims.) On the one hand, groups like the US National Academy of Sciences, in its classic 1983 discussion of societal health threats, argue that decisions about the magnitude and importance of such risks ought to be made by experts, since only scientific experts have the requisite technical expertise (NRC 1983).

On the other hand, later committees of the US National Academy of Sciences, like the 1996 group studying democratic constraints on risk imposition, (NRC 1996) argue that environmental-health decisions are not mainly about technical matters. They say such decisions are mainly about whether the potential victim community believes the risks are worth the benefits. Hence the citizens' groups maintain that stakeholder representation is essential to democratic control of public health. Otherwise, they say, vested interests likely would dominate decisions about environmental health.

Ethicists concerned about environmental health also disagree over (7) the legitimacy of using risk assessment and benefit-cost analysis in ethical evaluation of environmental-health problems. That is, they disagree over the degree to which analytic methods ought to be used to resolve these problems. On the one hand, many economists and policy-makers argue in favor of such analytic techniques on the grounds that they systematize the problem under investigation, clarify it, and make it more tractable (Shrader-Frechette 1991). They also argue that, because society does not have infinite resources to correct environmental-health problems, therefore techniques such as risk assessment are necessary both to quantify the risk and to determine how to evaluate it. On the other hand, many environmentalists are opposed to any use of analytic methods in environmental-health decision-making (O'Brien 2000). They say that such techniques err both because they give control of public health to vested interests, rather than to potential victims, and because it is not possible to put a price on the value of life. They also say that the techniques fail to take account of many important ethical considerations such as consent and equity. Finally they complain that the techniques unfairly presuppose a largely utilitarian account of public policymaking.

Policy Issues

In each of these areas of environmental-health debate, there are a number of concrete policy proposals that have been developed to address ethical aspects of environmental health. For example, one policy issue, regarding (1) rights to know, concerns whether the World Trade Organization ought to have the right to define accurate labeling on potentially dangerous foods as "impediments to trade." With respect to (2) autonomy and free informed consent, a crucial policy issue is whether representative democracy can adequately guarantee the free informed consent of potential environmental-health victims, or whether the victims themselves have the right to give or withhold free informed consent. For example, in the case of the proposed Yucca Mountain Nuclear Waste Repository, the US Nuclear Regulatory Commission, as a federal executive agency appointed by the President, claims the right to give free informed consent to the repository, whereas the residents of Nevada, 80 percent of whom oppose the facility, claim the right to withhold consent (Shrader-Frechette 1993).

On the issue of (3) equality and equal protection against environmental-health threats, one important current policy issue is whether all areas of the nation have equal rights to a liveable environment, or whether some people ought to have the right to trade the equal protection of their community health or environmental health for money. Is there a right to a liveable environment? Or is it a good that can be traded when necessary? Another policy issue is whether the US ought to require the same environmental-health standards for products manufactured abroad as for those manufactured in the US. Currently US manufacturers are held to higher standards of occupational health and environmental health than are the manufacturers from whom the US often imports goods and foodstuffs. Do these other nations have sovereignty over such decisions, or does the US have the right to demand the same safety standards of everyone who wishes to sell its products in the US (see Wallach and Sforza 1999)?

With respect to (4) rights to due process, an important policy issue is whether the US government ought to repeal the Price-Anderson Act. This law gives utilities protection against 99 percent of the costs of worst-case nuclear accidents, including costs and damages likely to threaten public health. Is the act constitutional, as the Supreme Court alleged, because no violations of actual due process, in the face of catastrophic accidents, have actually occurred? Or is the act a violation of due-process rights, rights that ought to be guaranteed in principle (Shrader-Frechette 1993, pp. 15-23, 96-98)?

With respect to (5) the burden of proof, an important policy issue is whether those who threaten environmental health, because of their products, ought to be held liable on grounds of considerably weakened evidentiary standards for proof of harm, or whether the current standards ought to be maintained. These current standards place the burden of proof on the potential victim. In the case of cancer, for example, it often is extraordinarily difficult for victims to prove what caused their disease, and most cancer outbreaks are recognized because of statistical associations that preclude proving that an individual cancer had a particular environmental-health cause (Cranor 1994).

In the area of (6) stakeholder representation in environmental-health decisions, one of the crucial policy decisions is whether all federal agencies who assess health risks ought to be mandated to change and therefore to follow the US National Academy of Sciences recommendation to give stakeholders equal weight (to experts) in decision-making regarding environmental health (NRC 1996). Many ethicists argue that justice requires not merely equal consideration of interests and equal treatment, but also equal voice in the decision about how to give equal consideration and equal treatment (Rawls 1971).

Finally, one of the crucial policy issues regarding (7) the legitimacy of using risk assessment and benefit-cost analysis in ethical evaluation of environmental and health-related problems is whether all federal health-related decisions require a cost-benefit justification, as the Bush Administration proposes, or whether justifications instead can be based purely on ethical criteria, such a rights to equal protection (O'Brien 2000).

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Fact Sheet on Environmental Health

In evaluating the extent of environmental-health threats, it is important to realize that factual information, often used as a basis for ethical decisions about environmental health, may fall victim to a number of biases and values. For example, threats to environmental health may be described in problematic ways as a consequence of at least 4 factual difficulties, (1) framing problems, (2) low-power studies, (3) alternative statistical-epidemiological methods, and (4) arbitrary decision rules.

Any ethical decision about the magnitude of an environmental-health threat is subject to considerable uncertainty as a consequence of different *frames*. For example, if one evaluates environmental-health threats to coal miners in terms of the “frame” of tons of coal mined, the health of miners appears to be improving. That is, coal-mine deaths, per ton of coal mined, have been decreasing since 1950 in the US. However, if one evaluates environmental-health threats to coal miners in terms of the “frame” of numbers of coal miners, the health of miners appears to be diminishing. That is, coal mine deaths, per thousand coal-mine employees in the US, have been increasing since 1950. Note that the number of deaths remains the same in both cases, but the *significance* of the number changes, on the basis of the frame that is used to view the deaths (see NRC 1996, pp. 50-52).

One of the most common ways in which a polluter is able to claim that there is no environmental-health threat that results from his activities is by using *small sample sizes* or *low-power studies*. For example, if an excess of 1 in 10,000 workers exposed to y amount of vinyl chloride dies, within 5 years of exposure, of liver cancer, and if the epidemiological studies investigating this health effect employ a sample size of only 200, there is only a very small probability that the test will reveal a 1 in 10,000 chance of cancer for a 5-year study, given the low incidence of the excess cancer. The sample size is too small to be likely to reveal the risk. Similarly with low-power studies. For example, when John Todhunter of the US EPA in 1982 reassessed the data alleging the carcinogenicity of formaldehyde, he concluded that the data did not show the carcinogenicity of formaldehyde. These negative statistical results, this failure to show a statistically significant increase in cancers, as a result of formaldehyde exposure among DuPont workers, however, appears to be merely an artifact of the low power of the statistical tests that Todhunter used. The DuPont study had only a 4 percent chance of rejecting the null hypothesis (and therefore inferring excess cancers), even if there were a twofold increase in cancer of the pharynx or of the larynx in those exposed to formaldehyde. That is, the DuPont study had only a power of 4 percent to detect twofold increases in cancers. As this example shows, failing to reject the null hypothesis does not rule out excess environmental cancers unless the epidemiological tests are reliable. (For the DuPont and Todhunter assessments and discussion of these problems in the formaldehyde case, see Mayo, 1991).

Other *statistical-epidemiological methods* also can cause environmental-health threats to be overestimated or underestimated. For example, many industries are likely to claim that their employees are more likely to die at home than on the job, that their homes are less safe than the workplace. They often make such claims on the basis of the “healthy worker effect.” This effect typically is exhibited when an epidemiologist compares the cancers per x workers in a particular industry, for example, to the cancers per x members of the total population. However, there is a selection bias in comparing worker health statistics to those of the general population. The general population includes very young people, very old people, highly sensitive people, people too sick to work, and so on, whereas the worker population is in the middle-age group, a group which is generally freer of highly sensitive people or sick

people (or else they would not still be working). As a consequence, even workers with higher rates of occupationally-induced illness may appear healthier than the general population, simply because epidemiologists use a selection bias in comparing their health rates to those of the general population, a population that includes many more at-risk people than does the work population (Moeller 1997, pp. 43-44.)

Still another common difficulty that arises in evaluating environmental-health threats is caused by use of different *decision-theoretic rules* for evaluating the same data. For example, according to the US government's Rasmussen Report, the probability of a nuclear core melt, in a US reactor, is about 1 in 4 for all US reactors, assuming a 30-year lifetime for the reactors. Assessments conducted by the Ford Foundation and by the Union of Concerned Scientists (UCS), however, disagreed on the environmental-health risks associated with using nuclear fission, even though both studies used the same data about reactor-accident probabilities and about accident consequences. What accounted for the difference in the health assessments? The Ford research was based on the widely accepted Bayesian decision criterion that it is rational to choose the action with the highest expected utility, where "expected utility" is defined as the weighted sum of all possible consequences of the action, and where the weights are given by the probability associated with the consequence. The UCS recommendation followed the maximin decision rule that it is rational to choose the action that avoids the worst possible consequence of all options. Thus, for identical data, the chosen decision rule--with particular ethical presuppositions--determined the calculated environmental-health threat associated with nuclear power. (For discussion of the Rasmussen Report, the Ford Foundation Report, and the UCS assessment, including these decision-theoretic rules, in areas of environmental health, see Shrader-Frechette, 1991, pp.100- 130.)

As the preceding paragraphs reveal, it is important to evaluate the factual-scientific basis on which the environmental-health threats are assessed, prior to engaging in ethical evaluation, because decisions about the acceptability of a particular environmental-health risk are a function of many subtle factors. These include the actual magnitude or seriousness of the risk. Moreover, this magnitude and seriousness can be underestimated or overestimated, purely on the basis of considerations such as framing, the power of the studies, statistical-epidemiological methods, and decision rules.

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Four Case Studies on Environmental-Health Controversies

In order to determine how the preceding ethical debates, policy options, and scientific methods play respective roles in controversies over environmental health, it is useful to examine, in more detail, several important environmental-health disputes. These concern, respectively, (1) environmental injustice in Homer, Louisiana; (2) escalating cancer rates, (3) endocrine disruptors, and (4) occupational health in the US.

For each case study, the issues of debate are introduced, and then readers are invited to consider various arguments, possible counterarguments, the need for additional information, the frames employed in the debate, relevant ethical values, and the interests of various stakeholders involved. References and citations for additional resources are provided. In addition, readers will find that every issue of the journal, *Environmental Health Perspectives*, provides additional information and potential case studies for discussion.

Case Study 1: Environmental Injustice in Homer, Louisiana

Do all citizens have equal rights to protection against threats to environmental health? This question arises both because minorities and poor in developed nations bear greater-than-average environmental-health risks and also because those in developing nations bear greater health risks than those in the developed world, in large part because of the policies of developed nations. For example, according to the US General Accounting Office, roughly one-third of all US pesticide exports are products that are banned or not registered for use in the US because they are deemed too dangerous. Instead the US ships them abroad. As already mentioned, the World Health Organization estimates that approximately half a million cases of accidental pesticide poisoning occur annually, with a death-to-poisoning ratio of 1 to 10. This means that each year, about 50,000 people die annually from pesticide poisoning, most in developing nations. One person is poisoned every minute from pesticides in developing nations (Mathews *et al.* 1986).

Such disproportionate environmental-health impacts also affect those in the developed world. In 1983, African-American sociologist Bob Bullard largely began the whole area of study known as “environmental injustice” when he showed that (1996), from the 1920s through the 1970s, Houston placed almost all its city-owned landfills in African-American neighborhoods. Although they represented only 28 percent of the city’s population, African-American communities received 15 of 17 landfills and 6 of 8 incinerators. Bullard showed not only that minorities across the US faced disproportionate environmental-health threats from incinerators and toxic-waste dumps, but also that these added risks increased other public-health problems--such as crime, poverty, and drugs--in minority communities. Comparing pollution in different California ZIP codes, researchers likewise showed that in the dirtiest US ZIP code, in Los Angeles, industries release 5 times as much pollution as in the next-worst ZIP code. They concluded it is no accident that the dirtiest ZIP code is 59 percent African-American. Thus African-Americans appear to be victims of a special public-health problem, environmental injustice.

To understand alternative perspectives on the issue of environmental injustice, disproportionate environmental risks’ being imposed on poor people and minorities, consider a recent case, a proposal to build a multinational, highly-polluting, uranium-enrichment facility in an African-American community in Homer, Louisiana. One of the poorest towns in the US, Homer has a per capita income of only about \$ 5,000 per year. Members of the local community were able to oppose the proposed Claiborne Enrichment Center facility only because of help from outside experts, and their stopping the facility in 1997 became the first major environmental-justice victory in the US.

Questions for discussion:

- Why would various parties want to locate a uranium-enrichment facility in Homer? Why might a multinational corporation want to build such a facility there? Why might residents welcome or oppose such a plan? Why would local businessmen or politicians welcome or oppose such a plan? Why would teachers, school administrators, and others concerned with public services welcome or oppose the building of such a facility?
- Why would “outsiders,” like environmental activists take an interest in Homer and the Claiborne facility? Who are the outsiders and insiders in cases of potential environmental pollution, and which should have the greater “say” in decisions about building a potential polluter? Why?

- What data should inform a decision about whether to build? In addition to scientific data about the facility and its environmental impact, what other data are relevant? How certain or uncertain are these data? In the presence of scientific, economic, social, or other uncertainty, who should bear the burden of proof and why?
- Can a community give informed consent to the initiation of a project like building the Claiborne facility? How would such consent be similar to a process of individual informed consent, and how would it differ? Consider what is discussed in Module 4 on community-based practice and research and on the process of sharing power within communities. Which methods discussed in that module might be useful in Homer?
- What would need to be disclosed and to whom in order for the community of Homer to make an informed decision about building the Claiborne facility? Are all of the issues to be disclosed factual, or are there ethical assumptions that need to be disclosed as well? Who represents the community in such a decision? Is it the community's decision to make?
- Consider some of the issues raised in Module 2 on the Tuskegee Syphilis Study and issues of race. What role does the predominant race of the residents of Homer play in the siting of the Claiborne facility there? Would you argue that the facility will benefit those of a minority group, African-Americans, or would you argue that they are being singled out to bear an environmental burden?

Case Study 1: Discussion

Henry Payne (1997) argued that the proposed Claiborne Enrichment Center, in Homer, Louisiana, would have been desirable for the local African-American community but that outside environmental activists misled the community into criticizing the facility, which actually would be in the community's best interests. Payne argued that these activists prevented Homer citizens from getting the industry and the jobs that they want and need. He argued that the proposed facility would bring jobs and an improved economy to a poor area, and yet that it would cause no serious environmental harm. Payne takes, as facts, (1) that the facility would have benefited minorities nearby, (2) that these minorities wanted it, (3) that outside activists did not want the facility, (4) that the proposed plant would help the local economy, and (5) that the facility would cause no serious public health or environmental harm. In claiming (5), Payne assumed (a) that in a situation of uncertainty, with little scientific study, ethics does not require people to be "safe rather than sorry." He also assumed (b) that the absence of positive evidence of harm from the facility, or ignorance about the facility, was the same as a guarantee of safety about the facility. Thus he made the ethical assumption (c) that public health advocates bear the burden of proof in alleging harm from a proposed plant. Finally, Payne assumed (d) that the requirements (see Beauchamp and Childress 1994) of free informed consent (disclosure, understanding, voluntariness, and rationality) were met in the Louisiana case and that the minority community therefore actually consented to the proposed facility.

In assessing the adequacy of the Payne account, one would need to evaluate his factual assumptions (1)-(5) and his ethical assumptions (a)-(d). One also would need to take account of the fact that, in arguing for both his ethical and factual claims, Payne cited neither any scientific analyses nor any ethical and legal analyses to support his position. Instead, he relied on a commonsense assumption that manufacturing facilities bring economic benefits.

Addressing Payne's points, Daniel Wigley and Kristin Shrader-Frechette (1996), argued that both Payne's factual and ethical assumptions are wrong, and they therefore claimed that siting the Louisiana facility is not justified. Shrader-Frechette and Wigley challenged both the factual assumption (1) that the plant would have benefited minorities and (5) as well as the ethical assumption (a) that ignorance about the facility justified believing it was safe. Analyzing the required environmental impact assessment (EIA) for the plant, they showed that its proponents failed to consider a number of costs of the facility and that these costs were likely to exceed the associated benefits. In particular, they argued that the jobs created by the plant would go to skilled white labor and professionals, not to unskilled blacks, and that the EIA included no probabilistic risk assessment of threats posed by the facility. Instead they revealed that the EIA made purely subjective judgments about site safety.

Much of the Wigley and Shrader-Frechette (1996) analysis was devoted to showing that the EIA performed by the enrichment corporation (wishing to site the proposed facility) employed procedures that actually violated minority rights to free informed consent. In particular, Shrader-Frechette and Wigley showed, first, that the corporation did not disclose the actual nature of the facility to anyone, and instead asked citizens if they would like to have a manufacturing facility nearby. The company violated the disclosure requirement (for free informed consent), second, by covering up the radiological risks and health threats to be imposed by the facility and by failing to reveal that the onsite radiological wastes would not be covered by US government regulations. Third, the company did not reveal that the products of the multinational facility would likely be used abroad, not in the US. Nor did it reveal that

these multinational products would compete with higher quality US products, while Louisiana residents would bear the health risks of the facility. In addition, Shrader-Frechette and Wigley argued that the site EIS violated the criterion of voluntariness (for free informed consent) because the corporation polled only white residents living a great distance away from the proposed facility. It did not even seek the opinions of any of the minority residents who make up the entire population living within 5 miles of the plant. Thus, Shrader-Frechette and Wigley concluded that the Louisiana facility siting amounted to environmental racism or environmental injustice and that neither factual nor ethical arguments, given in the EIA, were capable of supporting it.

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Case Study 2: Escalating Cancer Rates: Assessing Vested Interests and the Published Literature

Early in the pages of *Silent Spring* (1962), her classic book publicizing health effects of the use of chemical pesticides, Rachel Carson claimed that Americans ought to revise the US Bill of Rights. She pointed out that, when America was founded, Thomas Jefferson and his colleagues thought that the greatest threats to the “liberty, equality, and fraternity”—preached by the French and embraced in the colonies—were kings and unjust political institutions. Therefore Carson says they wrote the *Constitution* and the Bill of Rights so as to protect people against government incursions on personal liberty, health, and equality. If our founding mothers and fathers were alive today, however, Carson says that they would take care to rewrite the Bill of Rights so that citizens are protected against industrial pollutants, like chemical pesticides. She argues that powerful corporations (and corporations are defined as “persons” under the US *Constitution*) constitute a grave threat to public health, public liberty, and public equality, and perhaps a graver threat than that of unjust government. Carson encourages public-health advocates to ask how there can be rights to liberty when dirty technologies take away the liberty to breathe clean air. Or how there can be rights to life, when hazardous wastes pollute the water that is necessary to life.

Not everyone would agree with Carson’s analysis of the threats to environmental health today. In the case of cancer, for example, the scientific community and the ethical community are divided on the causes of the diseases and on the appropriate ethical response to it. As already mentioned, according to the US National Research Council (1993), cancer will soon become the leading cause of death of Americans. Moreover cancer is not a disease of old age, as cancer victims die, on average, 15 years earlier than others. It is the leading cause of death of children between the ages of 2 and 18, and the leading cause of death of women in their thirties. In fact, since 1950, the cancer rate for children under age 15 has increased by 32 percent. Cancer incidence, in the general population, is increasing six times faster than overall cancer mortality is decreasing (NIH 2000).

Because cancer is one of the major environmental-health problems, it is important to identify its causes and to prevent them. The environmental and medical communities tend to agree with Samuel Epstein (1998), that industrial pollutants are the major problem, while the governmental and industrial communities tend to agree with Bruce Ames that genetics and lifestyle are the main causes of cancer.

Initial questions for discussion:

- Why do you think that environmental and medical communities on the one hand, and governmental and industrial communities on the other, would tend to differ in their accounts of the causes of cancer? What interests are at stake for each “camp?” How do the influences on each camp affect the research agendas of each group?

Martin Walker (2000) uses the case of well-known British epidemiologist Sir Richard Doll to illustrate the thesis that scientists’ conclusions regarding the causes of cancer can be affected by their vested interests. Because many scientists obtain their funding from corporations, Walker (2000) and medical doctor Samuel Epstein (1998) argue that such scientists are pressured to defend positions favorable to industry. This can lead them to neglect or underestimate public-health risks caused by industrial practices and to overestimate natural causes of disease, according to Walker. In particular, Walker

(2000) argues that some prominent scientists (like Bruce Ames, Richard Doll, Richard Peto, and Lois Gold) who blame cancer on lifestyle and genetics are guilty of both ethical and scientific errors.

Questions for discussion

- In the preceding paragraph, what is meant by “natural causes of disease?” With what are such “natural causes” contrasted?
- What sorts of scientific and ethical errors might a commentator like Walker have in mind when he suggests that some scientists ignore or underestimate public health risks of industrial practices?
- Are there changes that could be made in the way science is done that would reduce the likelihood that scientists would make these sorts of errors because of their “vested interests?”
- Can scientists and academics be truly “disinterested?” How can they reduce the degree to which they have vested interests or are insufficiently disinterested? If it is true that people always have interests and are always beholden to some people, projects, or priorities other than the pursuit of truth, is it better to be beholden to some people, projects, or priorities as opposed to others?
- What are the people, projects, and priorities that influence your research agenda and the conduct of your work? How do these influences affect the outcome of your research? What are the relevant differences among influences on the choice of research question, influences on the funding of some research projects (and not others), influences on the outcome of research (i.e., findings), and influences on the dissemination of research findings? Are some sources, types, and targets of influence more troubling than others?
- What are the strongest sources of influence on those you work with in your department, work unit, lab, or school? Would those sources of influence be subject to the sorts of criticism that Walker offers?
- It would seem ideal for those private parties (e.g., corporations) that impose potential health risks to fund research to investigate the magnitude of those risks and to monitor the public’s health. Should such private entities bear this responsibility? How could they discharge this responsibility without placing those who investigate such risks in a position of conflicting interests?

Case Study 2: Discussion

On the ethical side, Walker says (a) that some prominent scientists cover up studies showing the negative health effects of industrial chemicals, for example, and (b) that instead of empirically investigating environmental-health effects, they typically rely instead on the mere opinions of scientific colleagues who are employed by (or subcontractors to) industries that use or manufacture toxic chemicals. In addition, Walker argues (c) that those (who blame lifestyle and genetics, not environmental pollutants, for most cancer) also are biased because their research is funded by vested corporate interests and not by disinterested scientific foundations. Finally, he claims (d) that disinterested academic and medical scientists have sharply criticized the methods used in such industry-funded studies.

On the scientific side, Walker says that a major reason the “cancer is caused by lifestyle not environmental pollution” advocates err is that they typically do not fund or do research on the epidemiological causes of diseases like cancer. Instead Walker says they tend to do only basic research on the theoretical mechanisms according to which cancer incidence occurs. Thus, he says they claim there is no evidence of environmental causes of cancer because they do not investigate possible environmental causes of cancer. In general, Walker accuses those (who say cancer is caused mainly by genetics and lifestyle, not environmental factors) of violating personal and professional ethical codes. They violate ethics, he suggests, by virtue of the fact that they tend to consider only the data and research that support the industry position, whereas they simply ignore all other information. In thus defending his view, Walker assumes that because vested interests tend to fund research that denies any environmental causes of many cancers, therefore that research is more suspect than that funded by disinterested government, academic, or medical agencies. He also assumes that the cancer analyses of public-health officials are likely to be more plausible than those of corporate-funded researchers.

In contrast to Walker, Bruce Ames and Lois Swirsky Gold (2000) claim cancer is caused mainly by naturally-occurring chemicals, genetics, and poor diet, not environmental factors. As a result, they contend that focus on environmental causes of cancer actually threatens public health and the common good because the focus does not address the main causes of cancer. Ames and Gold also maintain that investing public funds in research on the effects of synthetic chemicals damages public health by diverting resources away from more serious threats.

In presenting their case, Ames and Gold make both ethical and scientific assumptions. On the ethical side, they assume (a) that scientific research ought to address the most serious health threats first, namely those that kill the greatest number of people. They also assume (b) that those who create such health threats, or who profit from them, have no special ethical obligation to minimize those threats or to do research on them, provided that such threats are smaller than those arising from other social activities, like driving an automobile or smoking cigarettes. In other words, they make the ethical assumption (c) that the magnitude of public health threats, rather than the equality and fairness associated with their imposition, is what determines their societal importance. Pursuing this same magnitude or quantitative assumption, Ames and Gold argue that people worry needlessly about industry caused carcinogens (from things like toxic chemicals), because they say natural carcinogens in foods (such as coffee and peanuts) present greater risks than industrial substances. Following ethical assumptions (a), (b), and (c), Ames and Gold argue that public health officials ought to pay greater attention to natural carcinogens and less attention to manmade carcinogens. In other words, they make the ethical assumption (d) that private interests may contribute to public health risks, without ethical

violations, provided that the harm arising from their contributions is of a lesser magnitude than the dangers posed by natural sources. They also make the ethical assumption (e) that the liberty of private interests, operating in the market, is more important than mere possibilities of industrial harm, especially when the possible harm appears to be quite minimal, as compared to that caused by natural carcinogens.

References

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Case Study 3: Endocrine Disruptors: Approaches to Uncertainty

Many of the threats to environmental health arise from chemicals, especially because in the US, there are about 80,000 different chemicals used in industrial and agricultural processes in the US, and only about 2 percent have been tested for toxicity, whereas only about one-half of one percent have been tested for carcinogenicity, in part because testing is so expensive. In recent years, the environmental health threat from chemicals has mounted, because very low doses of organic compounds (like chlorine), doses far below that found to induce cancer, are now thought to be responsible for reproductive-related disorders associated with endocrine disruption. Behaving as synthetic estrogens, these endocrine disruptors are believed to be responsible for the declining sperm count in males, a decline evident since the 1950s. As a result of many small doses of organic compounds, males of many species have become feminized and, as a result, the species have gone extinct. In other cases, the increase of estrogens has caused a variety of additional, reproductive-related cancers (Colborn *et al.* 1993).

Theo Colborn and her colleagues (1993) argue that large amounts of chemicals have been released into the environment since World War II. Many of these chemicals, Colborn argues, have disrupted the endocrine systems of animals. (The endocrine system consists of glands that regulate various bodily functions, such as growth, reproduction, and nutrition, by means of hormones). Because many human-made industrial chemicals act as synthetic estrogens, they can disrupt the bodily functions that natural hormones regulate. Even minute exposures to these artificial chemicals, at any point in life, can pass them on to offspring during pregnancy and lactation. Colborn and her scientific colleagues argue that such chemicals can have adverse effects on reproductive and immune systems in humans and wildlife, even at levels far below those necessary to induce cancer. As a consequence, she argues for caution in employing these chemicals, a caution that would require much tighter environmental regulation. Some of these endocrine disrupting chemicals include PCBs, dioxin, and DDT. Colborn and those who argue that even small amounts of such endocrine-disrupting chemicals are risky thus assume that ethics requires one, in the face of incomplete scientific information, to use the precautionary principle. (The precautionary principle specifies that positive evidence of societal harm is not necessary before one takes precautions to protect public health. The rationale for the principle is that if one always waits until conclusive evidence of definite harm is available, then many public-health threats would be so advanced that it would be far more difficult to stop them and to prevent catastrophe. Proponents of the precautionary principle also argue that failure to employ the principle would amount to using humans as guinea pigs in industrial and economic experiments. Finally, proponents of the principle argue that because vested interests are so powerful, they often keep government from doing the necessary studies to confirm public-health harms arising from activities of those vested interests. They note, for example, that less than two percent of industrial and agricultural chemicals (of the 80,000 to 100,000 currently in use) have actually been tested for any health effects. In the absence of complete scientific studies about some hazard, proponents of the precautionary principle say it is necessary to take extra precautions to protect public health).

Besides supporting the precautionary principle, Colborn and other scientists (who argue that even small amounts of endocrine-disrupting chemicals likely are dangerous) claim that much scientific and public-health evaluation of these chemicals has been scientifically inadequate. They say (1) endocrine-disrupting effects occur at levels several orders of magnitude lower than those needed to cause cancer, and that government currently requires no tests for such effects. Yet, they note (2) that laboratory tests

and field data have revealed endocrine-disrupting effects on other animals. Besides, they claim (3) that the best scientific explanation of the reason for the continuing decline in human sperm counts, since 1950, is that humans are responding in the same way, in response to these chemicals, as other animals. Factually, Colborn and her coauthors assume that seriously damaging effects of endocrine disruptors, on other species, argues for caution in exposing humans to these chemicals.

On the ethical side, Colborn and her coauthors recommend more study of potentially endocrine disrupting chemicals, as well as their precautionary regulation, for at least two additional reasons. (A) They say ethics requires one to be especially careful of low-dose chemical effects because they often are incurred during neonatal periods but not manifested till middle age; ethics requires extra precaution with effects that are delayed, and therefore hard to detect, and with effects that are most damaging to the most vulnerable individuals, namely developing children. (B) They also say that ethics requires one to be especially careful of these chemicals because their effects are permanent and irreversible.

Reference

Theo Colborn *et al.*, "Environmental Endocrine Disruptors," Environmental Health Perspectives 101, no. 5 (October 1993), pp. 378-384.

Questions for discussion

- The whole issue of endocrine disruptors raises the question of how to behave in the face of environmental-health threats that are uncertain, that have not been definitively proved. Should one be a health conservative and assume the worst, in order to safeguard the gene pool and future generations? Or should one be a health liberal and not take drastic and costly steps to reduce endocrine disruptors until the scientific data are clear? Whose interests are served by the "health conservative" and "health liberal" positions?
- In conditions of uncertainty, who in society should be most stringently protected from health risks: the majority, the average person, the least-well-off, the most vulnerable, those who protect themselves, those who are not themselves "risk imposers?" What values support protecting each of these groups: fairness, respect for autonomy, utility (promoting good), beneficence, equality?
- What are the arguments in favor of the precautionary principle? What arguments can be made against following it? In the case of endocrine disruptors, what factual disputes could be raised against Colborn and her colleagues? What ethically-based arguments could be raised against her advocacy of the precautionary principle in this case? What role should concern for economic progress play in arguments for and against costly plans to reduce endocrine disruptors? What role(s) does uncertainty play in arguments about both environmental and economic impact of endocrine disruptors and their reduction?
- In balancing risks and potential benefits, what, if any, special weight should be given to risks of harms that would be permanent and irreversible? How should risks whose associated harms do not manifest themselves for some time be treated in the balancing of risks and potential benefits?

Case Study 3: Discussion

Those who tend to follow an egalitarian or contractarian ethical approach, like that of John Rawls (1971), argue that, in situations of scientific or medical uncertainty, one ought to be careful to protect the least-well-off, or most vulnerable, persons. These egalitarian ethicists attempt to follow the rule to treat people equally or consistently. One ought to follow a maximin decision rule, says Rawls, in situations of uncertainty characterized by (a) potentially disastrous consequences, (b) no overarching benefit to be obtained from taking the grave risk, and (c) little knowledge of the actual probability of disaster. The maximin decision rule specifies that, in situations of uncertainty, one's first or major goal ought to be not to treat people equally but to help the least-well-off people first. Ethicists who support use of egalitarian principle also say that it is not fair that one person should impose a potentially catastrophic risk on another, especially if the probability is uncertain, when the risk imposer gains from his action, while the risk victim may bear potentially great losses to which he has not consented and for which he has not been compensated.

On the other hand, those who tend to follow a utilitarian ethical approach, like that of John Harsanyi (1975), argue that following a maximin rule, in situations characterized by (a), (b), and (c) would be likely to thwart economic progress. They also say that following the maximin rule is not egalitarian but instead gives too much weight to the interests of potential victims. Finally they argue that rational people, in a high-risk situation of uncertainty, would be likely to maximize average expected utility and not follow a maximin rule. Rules to maximize average expected utility call for maximizing the average welfare of the average person. They do not call either for equalizing welfare or helping the worst-off.

Alicia Lubchenko (1990) and her colleagues, at the industry-funded American Council on Science and Health, argue that people need not be concerned about endocrine-disrupting chemicals, although these chemicals have been discovered to have an effect on wildlife. Lubchenko *et al.* say there is nothing to worry about, because humans are exposed to lower doses than is wildlife. Lubchenko *et al.* also argue that the chemicals are similar to estrogenic substances found in many plants, including those that humans eat, and that use of some estrogenic chemicals is decreasing. She argues that there is insufficient evidence to show that these chemicals actually harm humans. Lubchenko and her colleagues (who argue that so-called "endocrine disruptors" present no serious public health threats) thus disagree with Colborn *et al.* on both factual and ethical grounds. Factually speaking, Lubchenko assumes (1) that wildlife exposures to endocrine disruptors are greater than human exposures, even though Colborn denies this point, and even though humans are higher on the food chain than virtually all other animals observed to have endocrine-disrupting disabilities. (2) Lubchenko also notes that endocrine-disrupting chemicals are very weak, as compared to the normal human estrogens which they mimic, (3) that the link between specific chemicals and causal effects of endocrine disruption is controversial, and (4) that the many studies alleging a decline in male sperm counts also are controversial. In the face of their factual disagreement with Colborn *et al.*, Lubchenko and her coauthors make a number of ethical assumptions different from those of Colborn. They assume (a) that missing or controversial studies do not argue, ethically, for more regulation, or more precaution, regarding use of endocrine disruptors, whereas Colborn *et al.* argue that public health protection requires precaution, in the face of ignorance. Lubchenko *et al.* also assume (b) that if humans are naturally exposed to estrogens, therefore there is likely no serious harm and no ethical violation involved in exposing them to additional doses of synthetic estrogens, that is, to estrogen disruptors. Thus, even if Colborn and Lubchenko agreed on the

facts about endocrine disruptors, they still would disagree about the appropriate ethical response to this potential public-health problem.

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Additional resources

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Bernard Williams, Utilitarianism: For and Against, Cambridge, Cambridge University Press, 1973. (on utilitarian approaches in ethics)

Case Study 4: Occupational Health in the US

One of the most serious questions of environmental health is whether everyone ought to have equal rights to protection against environmental harm, or whether workers ought to be allowed to trade some safety in exchange for higher wages. Elephant handlers at the Philadelphia Zoo, for example, receive an extra \$ 1000 per year, in exchange for the risks they face of being mauled by the elephants. On the one hand, in many nations of the world, there is no double standard for environmental health risks faced by workers, and pollution control is required to be as stringent for them as for members of the public. Countries that typically have no such double standard for workplace risk include Germany, Sweden, and Denmark, and the former Soviet states that are now republics. On the other hand, in the English-speaking nations of the world, as well as Norway, there does tend to be a double standard for workplace and public risk, in part because these countries have been influenced by the economic theories of Adam Smith. Smith argued that a compensating wage differential (CWD), or hazard pay, justifies higher workplace risks; he says that workers may accept higher risks if they freely consent to the higher risks they bear in the workplace (Shrader-Frechette 2002, ch. 7).

In most nations of the world, for example, nuclear workers follow the regulatory standards set by the International Commission on Radiological Protection (ICRP 1991), according to which nuclear workers are allowed to receive, each year, up to 50 times the dose of radiation that members of the public are allowed to receive. Proponents of the double standard argue that workers are compensated for the extra risk and also that it would be paternalistic not to allow workers to take the risks they want (Viscusi 1992). Otherwise, workers' autonomy would be violated. Proponents also maintain that allowing a compensating wage differential maximizes overall welfare in society, because some risky jobs need to be performed, and it is better for them to be performed voluntarily. Besides, they note that the CWD promotes efficiency because it allows people to make the tradeoffs that benefit them.

References

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Kristin Shrader-Frechette, Environmental Justice: Creating Equality, Reclaiming Democracy, New York, Oxford University Press, 2002.

Kip Viscusi, Fatal Tradeoffs, New York, Oxford, 1992.

Initial questions for discussion:

- What arguments might be made *against* such a double standard regarding the degree of risk workers may incur as compared to members of the public?
- Think about products you are currently using or wearing. Do you believe that some workers involved in the products' production incurred greater risks than other workers or members of the public were exposed to? What was the nature of those risks? Do you believe those workers voluntarily consent to incur those greater risks? What information would you need in order to decide? How would you devise a compensation scale that reflected those differentials in risk? What factors would you take into account? What values would you employ to argue for your plan?

Case Study 4: Discussion of Initial Questions

Opponents of the double standard claim that the higher risks to which many chemical and nuclear workers, for example, are exposed, harms not merely them but their children and the gene pool (Herbert and Landrigan 2000). All amounts of radiation are risky, and only 35 ev are sufficient to damage DNA. Opponents of the double standard also argue that workers typically have not given free informed consent to the higher risks, and instead that they have been forced to take risky jobs, not because they want them but because they are poor or in dire financial straits. Opponents of the double standard likewise say that often workers do not know the risks they face, so they have not really consented. They maintain, as well, that for poor people, non-unionized people (about 85 percent of the workforce in the US), people without college educations, old people, women, and minorities, there is no compensating wage differential, regardless of the risk. They claim that there merely appears to be a differential because all workers are lumped together, aggregated, and their pay averaged together, on the basis of the risks they face (Shrader-Frechette 2002, ch. 7).

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Case Study 4: Part 2

Much of the debate over the ethical acceptability of worker consent to the higher workplace risks they face is focused on the state of worker health. If worker health is actually getting better, then concerns about harm, consent, and compensation may be misplaced, while, if worker health is getting worse, then this fact lends credibility to these concerns. The US Department of Health and Human Services (HHS 1999) suggests grounds for believing that worker health is improving. It points out that, from 1933 to 1997, deaths from work-related injuries decreased from 37 per 100,000 workers to 4 per 100,000 workers. This improvement is attributed to a number of factors, including efforts by labor and management, improved education, stricter regulation, and development of safer equipment.

In arguing that worker health is improving, the US Department of Health and Human Services (HHS) makes a number of ethical and scientific assumptions. On the factual side, the HHS notes that US workplace fatalities have decreased, especially in coal mines. The HHS thus assumes (1) that a decline in fatal workplace injuries argues for an improvement in worker health and (2) that the decline in fatal coal-mine accidents is typical of the improvement in worker health and welfare.

Reference

US Department of Health and Human Services (HHS), Achievements in Occupational Health, 1900-1999," Morbidity and Mortality Weekly Report 48, no. 22 (June 11, 1999), pp. 461-469.

Questions for discussion

- Remembering the discussion of vested interests in case study 2 (on the reporting cancer rates and causes), identify the parties who have competing interests with regard to the data collected and reported by the HHS. Are there other data that you would want to use to assess trends in workplace safety?
- Remembering that choice of a frame used to conduct an assessment, such as an assessment of workplace safety, can affect that assessment, identify the frame being used in the HHS assessment and suggest other frames. What are the arguments in favor of the use of each frame?

Case Study 4: Part 2 Discussion

On the ethical side, one can question whether the frame of fatal workplace injuries, however, accurately reveals an improvement in worker health and whether coal miners are accurate indicators of actual workplace conditions. According to Leigh (1995), only about 17 percent of workplace fatalities, about 17,000 per year in the US, arises from on-the-job accidents, like those documented by HHS. The remaining approximately 80,000 US workplace fatalities come from cancers induced by workplace exposure to hazardous substances (like radiation) and toxic chemicals. These 80,000 additional annual fatalities are much harder to detect, in part because there is no follow-up of employees who have retired, moved on, or quit work due to illness. Nor are there epidemiological studies or records kept of worker illnesses or cancers. If any records are kept, they are managed by the employers. Thus, the workers who succumb to latent, harder-to-detect cancers may represent a "silent majority" who (the HSS assumes) have no obvious health effects yet have much greater hidden health effects. If one assumes that the question of worker health can be "framed" purely in terms of acute problems, fatalities caused by on-the-job injuries, then the HHS may be correct that occupational health is increasing. If the frame is inaccurate, however, then the HHS may be incorrect. Likewise, the HHS may be incorrect to assume that coal miners represent typical groups in which workplace safety has improved. After all, coal mining has been known to be dangerous for centuries. Yet approximately 5,000 new chemicals, for example, are introduced into US industrial and agricultural processes each year, and most are not tested. If, as already noted, less than two percent of the approximately 80,000-100,000 industrial chemicals have been tested in any sense, then it may be that the largest workplace risks are in areas of unknown exposures and unknown effects, rather than in well-known areas of hazards such as coal mining.

Herbert and Landrigan (2000), however, offer grounds for questioning whether worker health is improving. Instead of focusing on acute problems, such as fatalities from workplace injuries, Robin Herbert and Philip Landrigan say that most workplace-related deaths are not from acute problems such as injury but from cancers, and that the cancers typically are not tracked or recorded as occupation-related. Herbert and Landrigan say that minorities are over-represented in jobs associated with toxic substances and that approximately 65,000 people die each year from occupation-related diseases, mainly cancer. They argue that, at least on the cancer front, workplaces are not safer, and that occupational health will improve only if there are better industrial-hygiene controls and substitution of less harmful products for toxic chemicals.

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Case Study 4: Part 3

In arguing that worker health is not improving, Herbert and Landrigan make a number of ethical and scientific assumptions. On the scientific side, they assume (1) that the frame of fatalities induced by workplace injuries is not an adequate measure of worker health and safety and (2) that until technology and manufacturing change radically, to use safer products and processes, worker health and safety will not improve substantially. Herbert and Landrigan also make the scientific or factual assumption (3) that because so little good data on workplace-induced disease exists, and because many workplace-induced diseases are not uniquely caused in the workplace (people have other exposures to chemicals and hazardous substances), it is very difficult to get firm data on workplace hazards. Nevertheless, they say it is clear that acute injuries (the frame used by HHS) grossly underestimates workplace caused deaths. Thus they tend to accept the workplace fatalities given by Leigh (1995).

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Questions for discussion

- What ethical or value-laden assumptions are implicit in Herbert and Landrigan's argument that worker health is not improving?
- Is it of ethical concern if particular groups within American society—e.g., minority group members, women, or the poor—bear a disproportionate burden of workplace injuries? Which ethical values support such concern?
- Is there is a responsibility to protect workers from workplace hazards? If so, who bears (or shares) that responsibility? Does it matter whether the workers are citizens, legal or illegal residents, or workers in other countries?
- If it would be of ethical concern that particular groups within American society bear a disproportionate burden of workplace injuries, does the same concern arise if particular groups within global society bear such a burden, e.g., particular nations, regions, or groups within other nations? If workplace injuries are of concern internationally or globally, what recourse to remedies do individuals, governmental agencies, and organizations within the US have?

Case Study 4: Part 3 Discussion

On the ethical side, Herbert and Landrigan assume (a) that completeness requires one to take account of latent, hard-to-identify cancer fatalities, induced by workplace exposures and (b) that fairness and justice require one to examine the health of minorities and the poor, because their workplace health threats are more severe than those faced by non-minorities and by middle-class workers. They also claim that there are ethical problems associated with claiming that US worker health is improving, especially given the fact that many US industries engage in an export of hazards so as to avoid US regulations. Herbert and Landrigan believe that this "export of hazards" is one reason that the International Labor Organization affirms that there are about a million workplace-related fatalities in the world annually. This number, they say (Herbert and Landrigan 2000) is more than double the number killed annually in wars throughout the world, and more than 100,000 greater than those killed in automobile accidents.

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Tools for Best Practice and Policy Assessment

In creating a case study of one's own, on topics of environmental health, one might focus on a number of key ethical themes, such as consent, equity, or compensation. With respect to consent, several types of cases lend themselves to discussion, especially those dealing with siting a LULU (locally unacceptable land use), a hazardous facility such as a waste dump. Virtually every community has some LULU, and there are many LULUs that deal with issues of national interest, such as the proposed Yucca Mountain High-Level Nuclear Waste Repository in Nevada. Because there are so many controversial sitings that allegedly threaten public or environmental health, it should be easy to investigate whether the conditions for free informed consent are actually satisfied in one or more of these proposed sitings.

With respect to equity and equal protection, it might be useful to discover, in one's own community, whether the poorest-income areas are those with the highest levels of air pollution. There are databases, some on the Internet, that show toxic releases in different areas. Air sampling is also an empirical strategy that might be used. By sampling air and by examining problems associated with "medical geography" databases, it should be possible to see whether there are potential problems of environmental injustice and whether there are any offsetting benefits (such as cheaper housing prices or increased employment) that might compensate for the alleged inequities in environmental-health protection.

Compensation issues in risky workplaces might be addressed by cases investigating environmental health in local places of employment. It might be instructive to determine, for a given workplace, whether there is indeed a compensating wage differential, and what its level is. It also might be instructive to examine whether, apart from compensation, workers in risky jobs have been adequately informed about the relevant environmental-health risks. Virtually all of the case studies related to environmental and occupational health can be addressed by examining some of the readings selected in the case studies for this module, and then following those investigations as a model for how one might examine ethical issues. The cases, however, will be more interesting if students address issues, pollutants, workplaces, and problems faced in their own communities. Such emphases will bring ethical issues "home."

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