Ethical Perspectives for Public and Environmental Health: Fostering Autonomy and the Right to Know

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In this paper we develop an ethical perspective for public and environmental health practice in consideration of the "right to know" by contrasting consequential and deontological perspectives with relational ethics grounded in the concept of fostering autonomy. From the consequential perspective, disclosure of public and environmental health risks to the public depends on the expected or possible consequences. We discuss three major concerns with this perspective: respect for persons, justice, and ignorance. From a deontological perspective, the "right to know" means that there is a "duty" to communicate about all public health risks and consideration of the principles of prevention, precaution, and environmental justice. Relational ethics develops from consideration of a mutual limitation of the traditional perspectives. Relational ethics is grounded in the relationship between the public and public/environmental health providers. In this paper we develop a model for this relationship, which we call "fostering autonomy through mutually respectful relationships." Fostering autonomy is both an end in public health practice and a means to promote the principles of prevention, precaution, and environmental justice. We discuss these principles as they relate to practical issues of major disasters and contaminants in food, such as DDT, toxaphene, chlordane, and mercury. *Key words:* **Canada, chlordane, DDT, environmental justice, fostering autonomy, mercury, precautionary principle, prevention, right to know, toxaphene.** *Environ Health Perspect* **111:133–137 (2003). [Online 25 October 2002] doi:10.1289/ehp.4477 available via** *http://dx.doi.org/*

The "right to know" has emerged in public health practice as a result of the devastating consequences from major accidents, such as the release of isocyanate in Bhopal, India, which killed 8,000 people and injured 50,000 (Hook and Lucier 2000). The accident is still causing health impacts (Dhara et al. 2002). In practical terms, the right to know has emerged in both the community and the workplace from an obligation that people should be informed of the risks they face in their daily lives (Baram and Partan 1990; Hook and Lucier 2000).

Within a narrow scope of risk communication, the right to know requires communication with the public about risks through one-way communication, as in health advisories, and two-way communication in specific situations (Lambert 1999). Both follow the "reasonable person standard" for developing and communicating information. However, the right to know should not be limited to catastrophic considerations, but should influence all public and environmental health practices, including environmental justice (Hook and Lucier 2000). Therefore, the right to know needs to be placed within the context of public and environmental health ethics.

The solutions we seek for the practical problems of moral choice depend on the perspective framework that we use (e.g., consequential ethics, deontological ethics, and environmental justice). We develop the perspective of relational ethics grounded in fostering autonomy as the basis for the right to know, environmental justice, and community-based discourse on public and environmental health practice.

Perspectives

The Consequential Perspective

From a consequential perspective, the rightness or wrongness of any act depends entirely on its consequences. Consequentialism in its simplest form is the moral perspective that the right action in any given situation is the one that will produce the best overall consequences, when judged from an impersonal standpoint that gives equal weight to the interests of everyone. All variations of consequentialism share the seductive idea that, so far as morality is concerned, people ought to produce the "greatest good for the greatest number," which implies we minimize evil and maximize good at the lowest possible cost. In the *Canadian Journal of Public Health*, this maxim has been stated as the theoretical ground of public health ethics (Bates 1936, Schwenger 1977).

This perspective has been subject to three particularly influential objections, which have a significant impact on public health ethics. First, consequentialism allows immoral acts if the act is expected to produce the net greatest good, that is, it allows some people to be harmed to serve the greater good (Scheffer 1998). In many regions, the harmed tend to be the marginalized segments of society. An example from public health practice in the United States is the Tuskegee syphilis experiment conducted on 399 African Americans from 1932 to 1972 (Adams 2002). The U.S. Public Health Service denied the men treatment in order to evaluate their symptoms of syphilis and follow the natural history of the disease; in this case, the disease remained untreated long after effective treatment was developed. From a consequential perspective, this experiment could be considered beneficial because it promoted knowledge of the disease, which in the long run would benefit American society as a whole. In Canada, the Alberta government conducted a eugenics program involving the sterilization of people determined to be "unfit" for procreation because of alleged inadequate mental development (Caulfield and Robertson 1996). The underlying concern in both of these examples is that individuals were not respected as having value as ends in themselves, but rather as a means to some other end in which they were not given a choice. The people in the Tuskegee study were treated as a means to the end of understanding syphilis, and those in Alberta were seen as a means to increasing the society's intelligence.

Second, consequentialism gives no direct weight to considerations of justice or fairness in the distribution of goods and harms (Scheffer 1998). An example of this is the emergence of the concept of environmental justice. In the United States, a large proportion of impoverished people from various ethnic groups live near hazardous facilities and waste sites (Perlin 2001). The emerging literature documents other serious environmental inequities in the areas of lead poisoning, air pollution, groundwater contamination, poor-quality drinking water, consumption of contaminated fish, habitat destruction,

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clean-up of Superfund sites, and unequal enforcement of environmental laws (Lee 2002).

Third, in decision making we frequently do not have the knowledge (are "under ignorance") to assign consequences, let alone the probabilities of consequences. Risk assessment has emerged as the fundamental tool in defining potential consequences. The results of risk assessments have been used to determine acceptable risk to hazards from industrial facilities in communities and acceptable levels of toxicants in environmental media, to rank pollutants of concern, and to rank which contaminated sites pose the greatest risks and therefore need to be addressed with greatest priority. The fundamental assumption is that we know the potential goods and harms and by technical definition of risk, we can assign them probabilities. Thus a consequential analysis can occur, and people can be exposed without harm.

However, certain consequences and probabilities occur only in card or dice games. Technology brings into being new and unexpected consequences. Between the deeds and their consequences there is a huge distance, both in time and space, such that we cannot fathom the unanticipated consequences. Examples from environmental practice illustrate the nature of things: estrogenic qualities of chemicals, destruction of the ozone layer, and global warming. Therefore, these consequences cannot be an explicit part of our moral consideration. This necessitates that we think of risk as broader than probability to include "decision under ignorance," and develop our ethical perspective accordingly.

The Deontological Perspective

Deontology is a duty-based ethic; actions are considered morally good if they follow from a duty or principle prescribed by reason, principles, or normative standards, not from the consequences the action produces. From a deontological perspective, certain acts are right or wrong in themselves, and not necessarily from the consequences they produce. Deontology is not as strong as absolutism, which claims that certain acts are right or wrong regardless of consequences. Arguably, deontology has been a part of public health practice since the ancient Greeks (Lambert 1998). In 1875, public health organizations in Canada grounded their perspective on the principle of prevention and duty to the public (Lambert et al. 1999).

One influential deontological theory is John Rawls' *A Theory of Justice* (Rawls 1971). In short, Rawls argued that objective individuals, ignorant of their position in a society, would chose fair principles of justice that would maximize the benefits of those "worst off in society," rather than promote the utilitarian principle of "greatest good for the greatest number." For example, if we were choosing rules to regulate society, justice as fairness would dictate everyone should be entitled to a minimum standard of health care and environmental standards. In contrast, utilitarian or consequential principles may dictate that some individuals have no health care and others have excellent care, that some live in extreme pollution while others live in an excellent environment, if the average aggregate good is maximized.

In current principle-based bioethics, four principles have emerged as the basis of the deontological approach (Beauchamp and Childress 1989). These are the modern versions of the ancient complementary ethical principles of beneficence (promote the good, prevent evil or harm, remove evil or harm) and non-maleficence (to not inflict evil or harm), and the principles of respect for personal autonomy and justice as fairness.

In public and environmental health, the principle of prevention has dominated, arguably, grounded in the concept of risk (defined as probability). This ethical principle must be broadened analogously to the concept of risk to include ignorance. In that respect, we see the precautionary principle (Kriebel et al. 2001). In short, the precautionary principle says that when an activity raises threats of harm to human health or the environment, precautionary measures should be taken, even if some cause-and-effect relationships are not fully established. Thus, an ethical principle of prevention and precaution reflects risk as a spectrum from certainty to probability and to ignorance.

Relational Ethics and Fostering Autonomy Through Mutually Respectful Relationships

Both of the theories described above are rationalistic theories about generalized individuals: the subject of the theory is an abstract person—someone who we cannot in principle know in any detail, not a specific individual in a specific context. Both perspectives seek general moral rules, which can be broadly applied to regulate human affairs. From this perspective, all we need to do is find the right rule or the right prescription to solve our problems as a whole. However, should our ethical perspective in public health be narrowed to defining the perfect game?

We argue that public health and environmental ethics should be grounded in particular human relationships and our ongoing relationship with the environment. Relational ethics is person specific; relationships and contextual details take precedence (Lambert 1998). It is through the experience of inequality and interconnection that gives rise to the critical importance of relationships. The seed of morality arises from competing moral impulses found in the particular moment in relationship with another person or the environment. To some degree, moral phenomena are not rational, regular, or repetitive, nor are they conveniently captured by rules of practice. The perspectives—rational and irrational, abstract and contextual—are conceptions of moral reasoning that coexist to help define what is ethical. Relational ethics is grounded in all of these conceptions. Central to this perspective is the principle of fostering autonomy through mutually respectful relationships, which we see as the root of relational ethics. Intuitions of this perspective have developed in this century in the *Canadian Journal of Public Health* (Lambert et al. 1999).

The perspective of fostering autonomy develops from contrasting two extreme conceptions of relationships that have emerged. At one pole stands the "healthcare provider stand-alone/paternalism-beneficence" model, which was dominant for most medical/public health practice for nearly 2,500 years (Laine and Davidoff 1996; Pelligrino 1993). At the other pole is the "person stand-alone autonomy" model, in which individuals are given complete decision-making authority. The "person stand-alone autonomy" model embraces the idea of autonomy as noninterference, generally held in nondirective counseling, neutral risk communication, and consumer models of health care. We see fostering autonomy as the middle ground, where neither the person, community, nor healthcare provider are alone, but each coexist in relationship in making decisions through genuine dialogue.

Fostering autonomy through mutually respectful relationships has five elements: *a*) developing and maintaining an open mind; *b*) developing one's own perspective; *c*) seeking the opportunity for creative insight and new facts to modify one's prior perspective; *d*) seeking the opportunity for expression of the perspectives of others; and *e*) generating motivation to care for each other and the environment. These five elements of fostering autonomy have been drawn from a number of sources, in particular Socrates (Lambert 1998). Of note, it is each person in the relationship whose autonomy is being fostered (i.e., the public, public health and environmental scientists, government officials, and industrial representatives). Central to the concept is people "being-for-others" in the relationship and turning to others for genuine dialogue about public and environmental health. In this respect, fostering autonomy is an "end" in the right-to-know process or the discourse on environmental justice.

Fostering Autonomy: The Means of Ethical Practice

Disaster Planning and Emergency Response

In most disasters, the exposures are acute and can be at high concentrations, such as the Bhopal disaster. Ashford (1988) suggested that the impetus to inform the public can be related to the certainty in the causal relationship. When we are certain of causation, then we can apply the principle of prevention without much difficulty, because perhaps the facts will speak for themselves. But when do the facts speak for themselves? When does the public have a right to know and a right to say what should be done? Rescue only comes when hazard is reckoned with.

The right to know means that communities should be involved in developing and understanding preventative emergency responses for their communities, regardless of the probabilities of failure. Prevention is generally considered the superior principle that guides action. Preventive planning involves multiple agencies in the community, not only the public living in close proximity. In planning future facilities and residential neighborhoods, the right to know provides the impetus to create and maintain a unified network for public and environmental health, community planning, and development. However, should any community be situated in close proximity to very hazardous facilities?

Morgan and Lave (1990) argued that in cases of acutely toxic exposures during an accident, with certainty in the causal relationships, we have a responsibility to prevent people from entering harm's way. However, they asserted the use of strong paternalism, coercion, and manipulation to protect people by providing barricades to prevent exposure to the accident; if required, they considered it acceptable to forcefully move people to safer locations. How far into the community does the barricade reach? Strong paternalism does not solve the problem because we cannot barricade the toxic emissions from spreading into the community even if we do barricade a small perimeter around the actual site.

In contrast, by embracing the concept of fostering autonomy, the public can formulate and share the imperative. The right to know means that people need to understand the reason behind evacuation, verbal injunctions, or barricades. Manipulation and coercion may save some lives, but they certainly do not foster understanding. Fostering understanding enables people to think and care for themselves and also to help in the preventive action by assisting other people to stay out of harm's way; this expands the reach of public health risk communication. Thus fostering autonomy is promoted as the means to fulfill the principle of prevention; prevention should not be asserted over fostering autonomy. Thus, the community should not be engaged because of a legislative right-to-know mandate, a fear of penalty, or a fear that the public may revolt; the community should be involved out of respect for people and to allow them to participate in the actual care of the community.

Contaminants in Food

Principles of Prevention and Precaution

Consideration of the principle of prevention follows from the determination that a chemical contaminant in food may cause harm. Typically, the difference between a safe or harmful exposure is calculated by comparing the minimum risk values with the amount of contaminant in the food. Similarly, with respect to carcinogens, if the risk value obtained from the calculation $r = q1^* \times$ dose, where $q1^*$ is the cancer potency, is greater than the standard (1 in 100,000 or 1 in 1 million chances), there is an impetus to consider the principle of prevention.

For broader contexts, chemical exposures in the total environment can be ranked following more elaborate schemes. The most hazardous chemicals are perhaps those with the lowest threshold dose and the steepest dose–response curve for the particular end point (Figure 1). More elaborate ranking schemes can be developed by considering the total mass released, the complete list of criteria for causal inference (Bradford Hill 1965), bioaccumulation, persistence in the environment, and atmospheric transport. As the weight of these factors increases, so does the impetus to consider the principle of prevention.

Following the "one chemical at a time" approach, there is potential harm from consuming fish in northern Canada. The following compounds exceed the guideline values: mercury (13 µg/kg/week vs. 5 µg/kg/week, provisional standard); toxaphene (1.2 µg/kg/day vs. 0.2 µg/kg/day, Health Canada tolerable daily intake); and chlordane (0.44 µg/kg/day vs. 0.05 µg/kg/day tolerable daily intake) (Chan et al. 1997).

From a consequential perspective, communication about contaminants stems from consideration of whether the contaminant or the communication itself will generally cause more good than harm (i.e., not from a responsibility to the people). The fact that these chemicals exceed the reference concentrations and may cause harm provides the impetus to consider informing the public. Alternatively, there is a duty to report contaminants in fish regardless of their concentration, especially chemicals above the reference concentration because they may cause harm. This necessitates the principle of prevention, perhaps through health advisories. However, fostering autonomy means that there is a duty to foster our common understanding, that is, to create common knowledge, not simply to report chemical concentrations in fish.

The principle of prevention has been applied to contaminants at the broader policy level. Toxaphene was first used in the 1940s; it was used extensively through the 1970s after 2,2[4-chlorophenyl]-1,1,1-trichloroethane (DDT) was banned in 1972, and was banned itself in 1982 (U.S. EPA 1982). Chlordane was used from 1948 to 1978 as a pesticide on food crops. In 1988, all approved uses of chlordane were terminated in the United States because it was reported to possibly cause cancer and cause behavior disorders in children exposed *in utero*, and it could harm the endocrine system, nervous system, digestive system, and liver (U.S. EPA 2002). DDT, toxaphene, and chlordane were banned to prevent further contamination of the environment.

When do we apply the precautionary approach? In 1950, Kay (1950) stated that

> The recent laboratory findings on the DDT successors such as chlordane, toxaphene, and methoxychlor indicate that these compounds possess typical chlorinated hydrocarbon toxicity. Lehman rates aldrin, chlordane and toxaphene higher in toxicity than DDT.

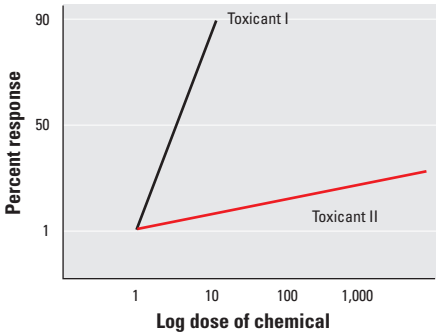

Figure 1. Ranking of toxicants demonstrated by a simplified representation of a straight-line dose–response relationship for two toxicants. Toxicants I and II both share the same lowest-observed-adverse-effect level (LOAEL) of dose 1. In this example, no individual organism responds to the toxicants below dose 1. In general, toxicants with the lowest LOAEL would be the most hazardous for comparable health end points; however, the slope of the response curve should be considered. If these two toxicants were being ranked on the basis of the LOAEL, the toxicants would have the same rank. However, the slope of the dose–response curve is steeper for toxicant I than toxicant II. Therefore, toxicant I is potentially more hazardous because small increases in dose result in a much greater response. If the end point of concern were lethality, a greater number of people could be killed with the same slight increase in dose above the LOAEL.

Furthermore, Kay (1950) stated that

> DDT and its analogues may be stored in considerable quantities in animal fat and be excreted via the mammary route.

These concerns were identified at the very beginning of pesticide use. In 1961, 4.9 ppm DDT was reported in human adipose tissue in Canadians (Read and McKinley 1961). In 1971, organochlorine pesticides were found to have accumulated and been stored in the placenta in every sample (52 samples), the average being 1.4 ppm DDT (McLeod 1971).

In 1950, the principle of prevention failed to prevent widespread exposures, perhaps because of a lack of causal relationships. This shows the value of considering the precautionary principle. Arguably, in 1950 there was a duty to take public health action consistent with the precautionary principle. Although scientists did not fully understand the health implications, they knew that DDT, toxaphene, and chlordane would bioaccumulate in food and that newborns would be exposed through breast-feeding. In fact, even now, we do not fully comprehend the health impacts from these exposures, given their estrogenic properties.

Mercury is a neurotoxin, which may possibly cause irreversible harm to children if it follows the pattern of lead toxicity (Clarkson 2002; Rice 1995). Mercury is naturally present in the environment; however, man-made releases from coal-fired thermal power plants and hydroelectric power have contributed significantly to the presence of mercury in fish, humans, and breast milk. Prevention of health impacts is being taken in the sense that mercury accounts for the vast majority of health advisories issued for fish. Of these four contaminants (toxaphene, DDT, chlordane, and mercury), the scientific evidence is perhaps strongest for mercury. Actual cases of nonlethal one-to-one causal relationships have been observed in humans from fish consumption, in particular, neurologic effects in the developing fetus [World Health Organization (WHO) 1990].

Kosatasky and Foran (1996) discussed the need to revise downward the WHO lowest-observed-adverse-effect level (LOAEL) for mercury of > 200 ppb blood mercury equivalent because the historic fish consumption studies do not support this value. However, the main problem with fish studies is the very small number of people involved in the studies. Indeed, in a Canadian aboriginal methylmercury study (Wheatley and Paradis 1996), the exposure population was small (0–19 ppb methylmercury, n = 29,724; 20–99 ppb, n = 8,239; 100–199 ppb, n = 541; > 200 ppb, n = 67). Of the people with > 100 ppb blood methylmercury, only 99 of 608 (1 in 6) people were examined in detail; 11 people had neurologic signs attributable to methylmercury, but definitive diagnosis was not possible. In this study (Wheatley and Paradis 1996), the actual minimum risk detectable in the range near the apparent threshold dose for methylmercury was 1 in 100. Which risks can we clearly see at the LOAEL? What can we actually say about causation, given the complex mixture of contaminants?

As a matter of prevention or precaution, should we advocate that people do not eat fish? Should we reccommend that people eat two fish a month from the north and 10 fish from the south to keep contaminant exposure within guidelines? We cannot offer them contaminant-free fish from southern Canada. Further, the southern Canadian diet is not necessarily healthier, and the people do not have access to fresh fruits and vegetables (Wein et al. 1996). If we advocate that indigenous people not eat the fish because the contaminants exceed guidelines for prevention or precaution, what are the implications? In Grassy Narrows, Canada, health advisories for mercury that suggested indigenous people stop eating fish resulted in serious sociocultural disruption and new unexpected health consequences (Wheatley and Paradis 1996). Clearly, the seeds of destruction may be sown with the seeds of good intentions.

Fostering autonomy means "being for" others in the relationship and turning to others for genuine dialogue about public and environmental health risks. In "being for" others, we need to be there with them, learn their language, in order to communicate with them about the goods and the harms we may be causing with risk communication and our health and environmental policies. Fostering autonomy brings all these factors into account rather than simply issuing informative health advisories based only on technical guideline values. This is not to imply that it provides any easy answers.

Environmental Justice

The presence of these toxicants, regardless of the fact that they are above the one-chemical-at-a-time risk levels, brings additional ethical concerns. The chemicals are being transported and concentrated in the north through natural atmospheric processes (Macdonal et al. 2000; Tenenbaum 1998). Thus, the environment and people in Canada's north, as well as northern populations around the world, will be continuously inundated with environmental contaminants such as toxaphene and mercury in the future.

In contrast to DDT, toxaphene, and chlordane, which have been banned, mercury is currently released virtually unregulated from coal-fired thermal power plants in Canada, the United States, and around the world. Is there really any prevention, precaution, or consideration of environmental justice with respect to mercury? In Alberta, Canada, the provincial government is in the process of increasing coal-fired electric generation. The contribution of mercury from any one power plant could be considered negligible. In fact, the contribution of mercury released from any single facility would be negligible to the global pool. However, these negligible amounts incrementally add up to cause harm.

The environmental contaminants in food and breast milk are challenging the indigenous people's way of being; their culture is at risk. This is a much broader consideration than the narrow risk assessment of probability of harm from contaminant concentrations in fish or breast milk and the good these foods provide. These immeasurable factors are not generally considered in risk assessments. In this respect, our thinking about risk needs to be broadened to include contextual factors and those that cannot be reduced to a common metric (Rappaport 1996; Thompson and Dean 1996).

How do we evaluate the health impacts to children, people, animals, or the environment more broadly, given the desire to use coal because there are hundreds of years of potential power in the ground? The populations of the north are not benefiting from our activities; perhaps from a consequential perspective their suffering is for the sake of the greater good. Thus, we do not reckon with the harm we are causing, nor do we respect the people's lives and culture, or the environment. Alternatively, respecting environmental justice carries the responsibility not to cause further harm through burning coal and an obligation not to burn coal until we can do so efficiently and without releasing mercury.

The literature on environmental justice argues for community-driven processes. Fostering autonomy provides a perspective for that relationship. However, how do communities in the north impact environmental policy in Alberta, Canada; Ohio, (USA); or China? This case clearly shows that more is required than simply community discourses. In this respect, fostering autonomy applies broadly: our duty is to respect people and the environment, and this perspective must be taken into account in decision making. Importantly, fostering autonomy must include development of political leadership. Environmental injustice is evermore embedded in our ways of doing things; it is the reason why a continuous discourse on environmental justice is needed. If our autonomy is not fostered, we will continue to reproduce past inequities at all levels of decision making.

Conclusion

Fostering autonomy through mutually respectful relationships is a means to the right to know, the principles of prevention and

precaution, and environmental justice. However, fostering autonomy must also be considered as an "end" in these processes. By considering fostering autonomy from a relational ethics perspective, we hope that the necessary tension between consequential and deontological perspectives can be balanced and, in particular, the principle of environmental justice respected.

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