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The Perils of Risk Avoidance

Catherine A. O'Neill

In managing the risks and responding to the harms of environmental contamination, there has been a recent embrace of strategies involving risk avoidance in lieu of risk reduction. Risk reduction strategies aim to clean up, limit, or prevent environmental contamination in the first place. Risk avoidance strategies, by contrast, leave contamination unabated. Risk avoidance strategies address the harms of contamination by requiring those whose circumstances or lifeways leave them exposed to alter their ways, thereby “avoiding” the risk. While the current Bush administration and some proponents of “regulatory reform” have endorsed this shift, a turn to risk avoidance is problematic on several scores and particularly troubling from the perspective of environmental justice. Moreover, the claimed cost savings of greater reliance on risk avoidance are likely to be overstated and realized only in the short term. The premise that risk avoidance can actually provide the “same amount” of human health protection as strategies that require risk reduction is in many instances highly questionable.

The recent Environmental Protection Agency (EPA) rule regulating mercury from coal-fired power plants exemplifies this move to risk avoidance. EPA, *Standards of Performance for New and Existing Sources: Electric Utility Steam Generating Units*, 70 Fed. Reg. 28,606–01 (May 18, 2005). Rather than seek fully to reduce the risks to those who “regularly and frequently consume large amounts of fish” by decreasing the amount of mercury emitted into the environment, the rule places responsibility on those affected to avoid the risk by altering their fish consumption practices. EPA instructs those affected, particularly children and women of childbearing age, to consult fish consumption advisories and reduce or eliminate fish from their diets accordingly.

There are other examples of greater recourse to risk avoidance as well. In the context of contaminated site cleanup, for example, agencies have increasingly fashioned “use-restricted” cleanups. Agencies have thus altered the cleanup baseline to allow some amount of contamination to remain at the site, undiminished in toxicity, while looking to institutional controls to restrict future uses of the site. Institutional controls refer to an array of legal, administrative, or institutional devices that urge or require people to limit their contact with the contaminants left in place. Such devices take the form of fences, warning signs, zoning measures, easements, restrictive covenants,

reversionary interests, and prohibitions or restrictions on resource use. In the context of forest management, the United States Forest Service (USFS) has opted to apply herbicides containing glyphosate, hexazinone, and triclopyr to recently logged or burned areas, in the process affecting native plants that are culturally important to the various California tribes and used for food, medicine, and basketry materials. Because these herbicide residues persist for up to 130 weeks, the California Department of Pesticides Regulation (CDPR) has issued warnings to California tribes and their members, who are exposed to the herbicides when they tend, harvest, prepare, and weave the plants in the process of making baskets. LinYing Li, California Environmental Protection Agency, *Data Analysis of Forestry Herbicide Residues in Plants of Interest to California Tribes 8–9* (2002). USFS has embraced such “herbicide treatment programs” even as CDPR has acknowledged that tribal members’ unique exposure scenarios are unaccounted for in the risk assessments conducted to set the parameters for use of the herbicides.

Yet another example may be found in agencies’ reliance on “ozone alerts.” Having failed to require risk reduction sufficient to ensure timely compliance with the Clean Air Act’s National Ambient Air Quality Standards designed to protect human health from the adverse effects of ground-level ozone, state environmental agencies have issued warnings on days when ozone levels are unsafe. These ozone alerts typically recommend that everyone—and particularly children, those with asthma or other respiratory conditions, the elderly, and those who work or exercise outdoors—curtail their outdoor activities during the day to avoid the adverse health effects of exposure. Some states are devising ever more sophisticated warning systems, even as efforts to prevent or control emissions of oxides of nitrogen and volatile organic compounds, the pollutants that contribute to the formation of ground-level ozone, lag.

There has not, however, been any systematic effort to justify a shift in favor of risk avoidance over risk reduction. This may be due in part to the fact that risk avoidance strategies have only recently begun to be categorized and discussed as such. Indeed, the dearth of critical attention has led one commentator to describe one category of such approaches as a “sleeping giant.” Amy L. Edwards, *The Sleeping Giant Awakes: The Growing Public Debate About Institutional Controls*, ABA SEC. OF ENV’T, ENERGY, & RESOURCES, ENVIRONMENTAL TRANSACTIONS AND BROWNFIELDS COMMITTEE NEWSL. (Jan. 2001). The lack of justification for the shift to date also may be due to the fact that risk avoidance strategies are difficult to spot to the extent that they are enlisted alongside strategies that

Ms. O'Neill is an associate professor of law at Seattle University School of Law. She can be reached at oneillc@seattleu.edu.

require some degree of risk reduction but that stop short of reducing risks to levels that are safe, “acceptable,” or technologically achievable. EPA’s mercury rule provides an example. Rather than require the 90 percent reduction in mercury emissions by 2008 estimated to be achievable (and arguably legally mandated under Section 112 of the Clean Air Act), EPA’s rule requires at most a 61 percent reduction by 2018. This substantial reprieve to the coal-fired power plants that emit mercury translates into significant risks not reduced from the perspective of those exposed—risks that, EPA suggests, can be avoided if those exposed change their fish consumption practices. Finally, the absence of a systematic justification may be due to the fact that the shift to risk avoidance in some instances is subtle, as measures initially designed to provide temporary warning of contamination while abatement proceeded apace have remained in place for decades, ultimately becoming a staple of agencies’ “risk management” efforts. Fish consumption advisories are a case in point: although held out by EPA as regrettable, short-term measures, advisories for mercury, polychlorinated biphenyls (PCBs) and a host of other contaminants have been in place in many locations since the 1970s, while the underlying pollution problems remain unaddressed.

To the extent that reasons have been offered, proponents have cited efficiency gains as the chief virtue of a move to risk avoidance. This justification has been most clearly articulated in the context of use-restricted cleanups, where, proponents argue, risk avoidance might be employed to garner the same amount of human health protection at a “radically reduced” cost. Philip E. Karmel, *Achieving Radical Reductions in Cleanup Costs*, 499 *PLI/Real* 371 (Nov. 2003). Although the promise of reduced costs stands as the primary rationale for a move to risk avoidance, other reasons have been suggested as well. Some proponents appear to endorse the shift to greater autonomy and to increased “individual responsibility” that risk avoidance strategies entail. Others see risk avoidance as a way to discount or discourage certain practices that they deem unnecessary or outside the norm. Note that still others have argued for risk avoidance measures while risk reduction efforts are ongoing, as when a fence is constructed and signs are posted around a contaminated site during cleanup operations. The arguments here are not intended to apply to such truly interim uses of risk avoidance measures—while risk reduction is pursued with all due speed—but to instances in which risk avoidance serves in whole or in part to supplant risk reduction as the regulatory end.

Attention to the costs of preventing, controlling, and

cleaning up contamination is indeed important, and the savings achieved by a move to risk avoidance are said to be substantial. However, for a variety of reasons discussed below, the touted cost savings are likely to be overstated and realized only in the short term, by the current generation. Moreover, the premise that risk avoidance can actually provide the “same amount” of human health protection—a claim vital to many proponents’ argument for a shift to risk avoidance—is in many instances highly questionable. Rather, a turn to risk avoidance is perilous on several scores and is particularly troubling from the perspective of environmental justice.

The Perils of Risk Avoidance

First, risk avoidance is myopic. Risk avoidance measures focus on specific, direct threats to human health and then target only human exposure to these threats. These measures seek to break the chain joining contamination to

adverse human health effects by focusing on a link late in the chain: the point of human exposure. Risk avoidance measures therefore leave unaddressed myriad other effects of contamination, such as the adverse effects on all nonhuman components of ecosystems. Loons cannot read fish consumption advisories. This lack of concern for nonhuman health is troubling for anyone for whom human health is but one component of ecological health or but one element of considered environmental law and policy efforts.

Even if one is concerned chiefly with human health, however, risk avoidance may fail ultimately to address many direct and indirect

effects on humans. Thus, whereas a risk avoidance measure may target a particular contaminant’s direct effects on human health (e.g., its toxicity to humans), the measure may neglect its indirect effects (e.g., its capacity to deplete resources on which humans depend). For example, current risk avoidance measures for methylmercury focus entirely on the toxic effects of consuming contaminated fish, urging women of childbearing age and children to decrease or eliminate fish in their diets to avoid methylmercury’s adverse neurodevelopmental effects. Yet there is evidence that methylmercury contamination also inhibits the growth of wild rice in the inland lakes of Minnesota and Wisconsin. Human health is potentially undermined along multiple dimensions, given that wild rice is a staple food for members of the various Ojibwe and other tribes and is relied upon for physical, economic, cultural, and spiritual health. While risk avoidance may take aim at the current human health effects of contamination left in place, it may fail to consider the effects should the contaminants migrate or otherwise behave in the envi-

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ronment in unpredictable ways. For example, recent reviews of a Superfund cleanup at a former mining site in the Coeur d'Alene River Basin have identified several mechanisms by which lead contamination from unremediated areas within this expansive site has begun to migrate, recontaminating areas that have already been cleaned up. Soils contaminated with lead are eroding from surrounding hillsides, are being tracked by vehicles from unpaved surfaces, or are otherwise migrating into relatively clean areas, including residential yards that have already been remediated. As EPA and the National Academy of Sciences have recognized, this migration undermines the assumptions on which current remediation efforts and institutional controls are based. EPA, *Second Five-Year Review for Bunker Hill Mining and Metallurgical Complex Superfund Site: Public Review Draft* (May 2005); National Academy of Sciences, *Superfund and Mining Megsites—Lessons from the Coeur d'Alene River Basin* (2005). Given the vast gaps in our current understandings of relationships among the various components (including human components) of ecosystems, it is quite plausible that contamination left unabated will ultimately contribute to indirect or direct human health effects.

To the extent that adverse effects on human and ecological health are left unaddressed by risk avoidance, any cost savings are likely to be overstated and enjoyed primarily in the short term. Even some proponents have acknowledged that the beneficiaries of risk avoidance will be limited to the current generation, for example, touting the cost savings of institutional controls "at least in the short run." Dan Miller, *Looking a Gift Horse in the Mouth: Federal Agency Opposition to State Institutional Control Laws*, 32 *Envtl. L. Rep.* (Envtl. L. Inst.) 11,115, 11,115 (2002). In addition, it has been widely noted that the costs of institutional controls and other risk avoidance measures themselves have largely been unaccounted for in the calculus of cost savings. In fact, as EPA concedes, "once the total life-cycle costs of implementing, monitoring and enforcing an [institutional control]—which may exceed 30 years—are fully calculated, it may actually be less costly in the long term to implement a remedy that requires treatment of the waste." EPA, *Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups* 8 (Sept. 2000). In some instances, moreover, it may be that costs are not only deferred but ultimately increased, as future generations are left to deal with a pollution problem made worse by time and inattention. For example, one close observer has suggested that institutional controls may ultimately fail—and so require sites to be reopened in the future for further cleanup—at as many as 100 percent of non-National Priorities List sites that have not achieved unrestricted use standards. John Pendergrass, *Institutional Controls in the States: What Is and Can Be Done to Protect Public Health at Brownfields*, 35 *CONN. L. REV.* 1303, 1312 (2003).

Second, risk avoidance efforts may be off target. Because risk avoidance focuses on the point of human

exposure, it depends on a complete understanding of the human health endpoints involved and the pathways and circumstances of human exposure. Where such understandings are less than complete, warnings will miss their mark and institutional controls will be misconceived. For example, as noted above, current risk avoidance measures for methylmercury focus on methylmercury's neurodevelopmental effects. Fish consumption advisories are thus aimed primarily at women of childbearing age and children. Yet the most recent studies reveal that methylmercury also adversely affects the cardiovascular system in adult males. This health endpoint and subpopulation at risk are largely missed by advisories. Or, for example, consumption advisories for methylmercury may be limited to fish, but humans may also consume other species, such as wild duck, that are contaminated with methylmercury, but for which no advisories have been issued—perhaps because health and environmental agencies were unaware of such consumption practices. Ultimately, the exposure scenarios around which risk avoidance measures are crafted may prove off-base because future land or resource uses are not accurately foreseen.

Third, risk avoidance is often not effective. In order for risk avoidance to work, advisories must be received and understood, restrictions must be monitored and enforced. Ultimately, human behaviors must be changed. Even proponents of risk avoidance concede the considerable hurdles in each of these respects. There is ample evidence that advisories and warnings often do not reach their intended audience. For example, a recent study showed that half of those consuming fish caught on the Great Lakes were unaware of the relevant fish consumption advisories. John Tilden et al., *Health Advisories for Consumers of Great Lakes Sport-Fish: Is the Message Being Received?*, 105 *ENVTL. HEALTH PERSP.* 1360 (1997). Notably, people of color, women, and those without a high school diploma evidenced the least awareness. Even where those at risk are aware of the relevant advisories, it is often the case that they do not recall accurately or do not understand the content of the advisories. Although health and environmental agencies have recently made some progress here, it is fair to say that risk communication is far from effective in this regard.

There is also evidence that restrictions on the use of contaminated sites and resources are often not implemented, monitored, or enforced. A recent study by the Government Accountability Office (GAO) of Superfund sites at which institutional controls were employed as risk avoidance measures provides several examples. U.S. Government Accountability Office, *Hazardous Waste Sites: Improved Effectiveness of Controls at Sites Could Better Protect the Public* (Feb. 2005). At one site, an institutional control prohibited any use of groundwater without prior written approval from EPA. However, in 2003, EPA discovered that more than 25 million gallons of this water had been pumped for use as drinking water during the previous year, and that this use may have been going on for some time during the prior four years as well. At another site,

an institutional control required monitoring for worker safety precautions during any digging operations at the site. A GAO visit, however, revealed active digging about which the EPA official charged with supervising the site was unaware, having not visited the site in four years. At a third site, GAO found significant evidence of trespassing at the site, but a steadfast refusal on the part of the responsible official to undertake monitoring. Advisories and warnings, too, may not be adequately maintained. For example, agency officials in New Jersey found that a sign advising against crabbing on the Hackensack River had fallen or been taken down and was being used, ironically, by a family who had placed it over a fire to support a cooking pot filled with river water and freshly caught crabs.

Even if risk avoidance measures can be maintained in perpetuity and are completely effective in reaching and being understood by their intended audiences, it is notoriously difficult to effect behavioral changes in people. For example, despite being aware of methylmercury contamination in the fish caught in freshwater lakes in Wisconsin, and despite having been advised by his physician to eliminate fish from his diet in order to address elevated mercury levels in his blood, one recreational angler concedes that he “can’t help himself” and so “now cheats a bit” and eats the fish he catches. *NOW with Bill Moyers*, Transcript (June 25, 2004).

These hurdles, moreover, loom larger and may become insurmountable when those affected do not speak the language in which advisories are dispensed, do not have the economic wherewithal to alter their practices, or do not share the culture of the dominant population. Those who do not speak English may be missed entirely by warning signs posted only in English. Those with modest economic means may have few options for risk avoidance: it may be wholly impractical to fish “elsewhere” if all of the rivers, lakes, and bayous nearby are contaminated and one does not own a car; it may be unrealistic to stay inside on “ozone alert” days if one’s livelihood depends on working out of doors. And those for whom fish consumption includes spiritual, traditional, or cultural dimensions may feel that it is simply not possible to cease eating fish. In the case of members of the various Ojibwe tribes, for example, a recent survey showed that whereas 57 percent of tribal fishers were aware of mercury advisories for walleye, only 9 percent had ever refused to eat walleye in a group setting such as a feast or a ceremonial gathering.

The limited efficacy of risk avoidance raises serious questions about whether such approaches can actually garner the “same amount” of human health protection as risk reduction. At the very least, improvements to risk avoidance strategies would require significant expenditures; for example, on research in the field of effective risk communication and on monitoring and enforcement of institutional controls in perpetuity (a recommendation of the GAO report). As a result, the apparent relative cost savings of risk avoidance are again likely overstated. Given the

nature of some of the hurdles, moreover, it is doubtful whether even improved risk avoidance efforts could ever be completely effective in changing humans’ behaviors and lifeways. This point, of course, undermines one of the very premises of risk avoidance; that is, that humans will be protected because they will not be exposed.

Fourth, risk avoidance is an approach with finite possibilities. The options for risk avoidance may be few. Some pollutants can be more readily avoided than others, some resources more readily replaced by surrogates. For example, a fisher seeking to avoid PCB contamination might be able to alter his preparation methods—trimming the skin and fat from fillets and broiling or grilling so that the fats drips off while cooking—but to continue to fish at his customary sites and for his customary species. A fisher seeking to avoid mercury contamination, by contrast, cannot do so merely by altering her preparation methods, because methylmercury accumulates in the muscle tissue that comprises the fillet. Instead, she must take steps to reduce—and, in some cases, eliminate altogether—her total consumption of particular species caught from contaminated waters and to pace her allowable intake to avoid acute exposure.

As a general matter, the more risk avoidance is allowed to supplant risk reduction, the fewer the available means for avoidance. One proponent of advisories, for example, warns nonetheless that their proliferation could eventually result in cognitive overload, with humans unable to process the information they receive. At some point, as a result, more advisories would bring diminishing returns. W. Kip Viscusi, *Risk Equity*, 29 J. LEGAL STUD. 843 (2000). More fundamentally, heavy reliance on risk avoidance would eventually lead to a world in which there are no longer any healthful alternatives, as uncontaminated environments are permitted, one by one, to become and remain degraded. Eventually, if mercury emissions were to continue unabated, there would be no “safe” species of fish, no lakes free of contamination. If trichlorethylene (TCE) were to remain untreated in every aquifer, there would be no water left to bottle.

Fifth, risk avoidance may itself introduce risks. If those exposed change their ways to avoid risks posed by contamination, they may adopt practices that subject them to a different set of risks. To the extent that asthmatic children heed warnings to avoid sports and other outdoor activities on “ozone alert” days, for example, they may face an increased risk of obesity and other ills that attend a more sedentary lifestyle. To the extent that those affected “comply” with fish consumption advisories, for example, the potential for countervailing risks is a serious concern. The nutritional benefits of frequent fish consumption are well known: fish are an efficient source of protein, omega-3 fatty acids, selenium, and other nutrients important to human health. By foregoing these benefits, those affected may open themselves to an increased risk of coronary and other diseases. In addition, for those for whom fish forms a part of a traditional diet, including those in the fishing

tribes of the Pacific Northwest, the upper Great Lakes, and elsewhere, regular consumption of fish and other traditional foods may function to promote health and to combat diabetes, a particular concern for tribes given the high rate of diabetes among American Indians and Alaska Natives. Kari Norgaard, *The Effects of Altered Diet on the Health of the Karuk People: A Preliminary Report* (Aug. 2004). Agencies may believe themselves to have made informed choices and tradeoffs before opting for risk avoidance. However, agency decision makers may not foresee fully the roster of countervailing risks introduced by avoidance measures. Each of these countervailing risks, of course, introduces costs that must be added to the risk avoidance side of the ledger.

Finally, risk avoidance is fundamentally unfair. The burden of undertaking risk avoidance measures is likely to fall disproportionately on tribes and indigenous peoples, other communities of color, and low-income communities because it is these communities who are likely to be among the most exposed. In the case of mercury, whereas members of the general population, especially those who do not consume fish, are not much affected by a turn to advisories in lieu of reduced contamination, members of the Ojibwe tribes and other fishing peoples will be faced with the "choice" of curtailing severely their fish intake or being exposed to methylmercury in fish at levels determined to be unhealthy for humans. Indeed, EPA unflinchingly acknowledges that it will be Native Americans, Southeast Asian Americans, and lower-income subsistence fishers who will be subject to these avoidance measures. EPA, *Proposed National Emissions Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards for Performance for New and Existing Stationary Sources: Electric Utility Steam-Generating Units; Proposed Rule*, 69 Fed. Reg. 4652, 4709 (Jan. 30, 2004). And although data are sparse, it may be that institutional controls are being employed more often in non-white communities than in white communities. Erwin Tam, *Analysis of Institutional Controls at California Superfund Sites* (unpublished paper), available at http://ist_socrates.berkeley.edu/~es196/projects/2000final/tam.pdf.

Moreover, risk avoidance measures are likely to be evaluated by reference to the understandings and commitments of the dominant society and adopted only where avoidance is thought not to occasion great costs or profound loss. Catherine O'Neill, *Risk Avoidance, Cultural Discrimination, and Environmental Justice for Indigenous Peoples*, 30 *ECOLOGY L.Q.* 1 (2003). Yet the understandings and commitments of those who will be faced with altering their practices and lifeways may be quite different than those of the dominant society.

This will often be the case where Native peoples are prominent among the risk bearers, as they are when the source of risk is methylmercury contamination. Thus, environmental injustice here arises not only from distributive inequities but also from cultural discrimination. Not only are the Ojibwe and other fishing peoples the ones most heavily burdened by reliance on fish consumption advisories, but they are also likely to understand differently the nature of this burden. There are likely profound differences in the value attached to fish, fishing, and fish consumption as between various indigenous peoples and the dominant society. For the fishing tribes of the Great Lakes, as for fishing peoples elsewhere, fish and the lifeways associated with fish are central to their identity as peoples; they are indispensable to phys-

ical, social, economic, political, spiritual, and cultural health. For the dominant society, by contrast, these practices, while important, are likely not constitutive of their very identity. Thus, for example, a member of the general population who habitually consumes two meals of fish per week might, in the face of fish consumption advisories for mercury, look to substitute food sources with relatively modest accommodations to palate and pocketbook. A member of the Mille Lacs Band, however, might view such risk avoidance measures as impossible, given the affront this would mean to her tribe's very identity, to what it means to be Ojibweg. By permitting significant mercury contamination to remain and

relying instead on fish consumption advisories, then, EPA can be characterized as perpetuating a long history of cultural discrimination against American Indian peoples.

In the end, the perils of risk avoidance are several and serious. Yet those who have embraced risk avoidance have made little effort to consider these perils, and certainly have not done so in any sustained fashion. There is thus a need for a sober assessment. Of course cost savings are important: no one wants to spend any more than is necessary to protect human and environmental health. But we must recognize that rosy projections of cost savings are likely overstated; that the "same amount" of human health protection is not now, and may never be, provided; and that some among us—tribes and their members, communities of color, and low-income communities—likely bear the brunt of the burden of risk avoidance. Thus, risk avoidance may simply be an inappropriate substitute for risk reduction in many instances. We must also stand back and ask the very basic question whether this is the direction we wish to take environmental law and policy: whether we wish to shape a world in which we must refrain from eating the fish, drinking the water, playing at the field down the hill, working outdoors, and undertaking a host of other heretofore ordinary, healthful, and even cherished human activities. 

The premise that risk avoidance can actually provide the 'same amount' of human health protection . . . is in many instances highly questionable.
