

Whistleblowers in Environmental Science, Prevention of Suppression Bias, and the Need for a Code of Protection*

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Suppression bias is the distortion in the estimate of findings on hazard and risk inimical to special or national interests, and is well known (1-4). The direct and indirect repercussions of suppression bias are issues of direct importance not only to environmental scientists and health and safety professionals, but also to the public itself. These repercussions raise questions as to the adequacy and degree of protection provided by professional organizations, research institutions, and the legal system against such suppression bias.

Suppression bias is rooted in the way societies react to troublesome information, as we know from the tradition of shooting the messenger of bad news. The trial of Socrates served as the classic case study of the risks to messengers. The jurors of Athens, a city besieged from without and insecure from within, convicted Socrates and sentenced him to death for corrupting the morals of the youths of Athens (5-6). Legal scholars have pointed out that Socrates would be convicted by a modern jury for the same reasons that he was convicted by the jury in Athens: his teachings undermined order, stability, and state security. For Athenians, there was a Benthamite rationale for putting Socrates to death: silencing him was necessary to preserve the greatest good for the greatest number in a society weakened by external wars and internal divisions (7).

Environmental scientists and occupational health and safety professionals measure and report health risks from exposures to toxic and physical agents so that preventive measures can be put into

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effect. We define epidemiologic messengers, or whistleblowers, as persons who are subjected to harassment, lawsuits, ostracism, job loss, loss of funding, intimidation, abuse, threats, or even force after reporting such risks, or are prevented from investigating or reporting risks altogether.

In most scientific fields, the rewards go to investigators who report "positive findings." But in the environmental sciences, the situation is the opposite. In environmental and occupational medicine, and in epidemiology and related disciplines, "positive" findings about hazards and risks are threatening to powerful interests. Investigators who study or report these risks are therefore at increased risk for harassment by the very nature of their work.

Ultimately, suppression of information about hazards and their health risks may itself become hazardous to public health. There has not been sufficient recognition of the possibility that such pressures may serve to deter investigation or assessment of health risks from exposures, and thereby delay or block the implementation of preventive measures. So far, there have been few systematic efforts to examine the impact of such pressures on the direction, content, and work output of environmental epidemiologists, physicians in occupational medicine, and other scientists. Nor has there been sufficient attention as to how to respond to these pressures.

Methods

This paper reviews past reports and summarizes work now being carried out by the ISEE Committee on Philosophy and Ethics and the Collegium Ramazzini. This work documents episodes of harassment of environmental scientists and episodes of responding to requests for assistance from environmental messengers subject to harassment. We also make recommendations for future action by governmental organizations, which define standards for research policy.

Findings

In the 1980's, the United States Environmental Protection Agency (EPA) published a document which described the hazards unique to environmental scientists and the forms of harassment to which they may be subject. It made the point that harassment is most likely directed at younger or less well-known scientists, employees of government or industry, or members of the exposed population itself in

settings where protection of human rights is weak. However, information is not readily available on the degree to which this or other Federal agencies defined institutional responsibilities to protect investigators from external or internal harassment.

The context and content of the problem

Martin (8) has listed the five methods of suppression bias. These are: (a) preventing creation of data (b) controlling, (c) blocking, (d) distorting data, and (e) attacking researchers. This simple list shows that using harassment to block dissemination of data on hazard and risk and attacking researchers who report such findings are only part of a syndrome of suppression bias, leading to what is known as lamppost toxicology or epidemiology. Martin and Deyo have reviewed the driving forces, context and methods of harassment of epidemiologic messengers or whistleblowers, and have provided case studies (1, 2, 8).

The reported distribution of the problem: sentinel episodes

Does suppression bias deter the prompt detection, reporting and prevention of hazard and risk? If so, is this bias systematic, episodic, or sporadic and what are its distributions and determinants? The details of whistleblower harassment are not frequently publicized (9), but below we present a list of episodes that have come to light in the past years from reports gleaned from the professional and lay literature, and from our own direct contacts.

Cases of suppression by a governmental institution

- Cate Jenkins, an environmental scientist with the US EPA, claimed that chemical industry studies had consciously minimized the hazard of dioxin (10-11). She received a written reprimand for writing down what she knew about the history of the dioxin incinerator regulations (12-13), and was transferred from her position.
- Omar Shafey, an epidemiologist in the Florida State of Health, was forced to leave his position after publishing an epidemiologic report on complaints of acute illness in residents exposed to drift from aerial spraying of malathion, used to control

the Medfly (14).

- Desi Mendoza Rivero, a Cuban physician, was imprisoned after he issued statements regarding an epidemic of dengue fever (15).
- Grigory Pasko and Alexander Nikitin, government scientists in Eastern Europe, were accused of treason and subjected to physical abuse after they reported dangers from nuclear waste in Murmansk (16-17). From newspaper reports, it appears that Pasko's subsequent acquittal was reversed (17).
- Melvin Reuber, a toxicologist at the Frederick Cancer Research Facility in Maryland (which is part of US National Cancer Institute) studied links between pesticides and cancer. As a result of his studies, he is one of the world's leading critics of pesticides. In 1981, he was subjected to an attack on his work and his credibility that shattered his career (18-19).
- In the United Kingdom, a Health and Safety Executive (HSE) memo indicates that several researchers and health and safety activists who exposed poor health and safety practices were targeted for special surveillance (20).

Cases of suppression by an academic institution

- John Coulter, a medical researcher at the Institute of Medical and Veterinary Science in Adelaide, South Australia was dismissed from his post after releasing a report that ethylene oxide was mutagenic (21).
- Robert van den Bosch of the University of California, Charles Lincoln of the University of Texas, and Robert Fleet of Texas A&M University all suffered abuse because of their research on the hazards of pesticides (22).
- David Kern, an occupational physician and epidemiologist at Brown University Medical School, received notice that his tenure would not be renewed and his clinic closed after he reported numerous cases of interstitial lung disease in nylon flockers at Microfibres (23).
- In Israel, Dr Jerome Westin was greylisted for any governmental or academic appointments after publishing findings on massive contamination of the nationwide milk supply

with organochlorines (24).

Cases of suppression by industry

- In the 1940's, Randolph Byers, the Harvard pediatrician, was sued for defamation and damages by the Lead Industries Association for publishing findings on brain damage from acute lead poisoning in children from nibbling paint chips (25-26).
- Doug Johnson, a safety specialist for Tatitlek, Chugach, and Chenega Corporation in Alaska was fired after raising environmental concerns regarding Alyeska's oil spill response program in Prince William Sound (27).
- Myron Mehlman, a Mobil Oil Corporation toxicologist, was fired after advising a Mobil subsidiary in Japan to stop selling gasoline with hazardous levels of benzene, a known carcinogen (28).
- Alexandra De Blas of Australia was threatened with a suit for defamation by a mining company when she attempted to publish a thesis about environmental impact of its operations (29).
- Dr Yoram Finkelstein, an Israeli neurotoxicologist with important publications on organophosphates and lead, is currently the target of a SLAPP (Strategic Lawsuit against Public Protestors) lawsuit for libel after writing a medical opinion on the health risks from emissions of hexavalent chromium, Cd, lead, Ni, and other pollutants from an aluminum foundry (30).

Survey Results

At the Annual Conference of the International Society for Environmental Epidemiology (ISEE) held in 1999 in Greece, the Committee on Ethics and Philosophy distributed a questionnaire to the delegates. Out of 10 individuals who completed the questionnaire, five reported harassment following publication of research findings on health risks from environmental exposures. The following is a brief description of these cases:

- Male MD, age 47, a scientist in a major Cancer Institute in Italy, experienced ostracism after publishing findings on asbestos exposure in a petroleum refinery and lung cancer.

- Female MD, MPH, age 60, was threatened with loss of her job after publishing findings on TCDD exposure and cancer.
- Male MPH, PhD., age 53, experienced ostracism and the threat of job loss after publishing findings on cancer mortality in Vietnam veterans exposed to Agent Orange.
- Two Female MDs, investigators age 59 and 47, experienced both ostracism and confiscation of data after publishing findings on ethylene oxide exposure and breast cancer.

Pressures on institutions

Deyo et al have reviewed Congressional harassment of the CDC Injury Prevention Unit following its epidemiologic work on impact of gun control laws on violent deaths (2).

Actions to date:

The International Society for Environmental Epidemiology (ISEE) Committee on Ethics and Philosophy and the Collegium Ramazzini Committee to Protect Whistleblowers are working in parallel to provide moral and professional support to whistleblowers (31). The ISEE has already developed procedures designed to provide an international service of advice, referral, and support for environmental whistleblowers which was first presented in a special workshop at the ISEE International Conference in Athens in 1999 (not far from the site where Socrates was convicted.) The Collegium Ramazzini is now doing the same, and is planning to expand media reporting of whistleblower harassment, with particular attention to occupational medicine professionals in developing countries. The aim of both professional societies is to establish systems for monitoring and reporting harassment and abuse of whistleblowers, and to offer support and assistance should it be requested.

In 1996-97, before ISEE developed these procedures, it reacted to two situations in which investigators were subject to political pressures resulting from the publication of their findings. In the case of Dr. Herbert Needleman, ISSE sent a petition signed by many of its members to the University of Pittsburgh asking that its review of the validity of his findings on the effects of low level lead exposure on intelligence scores, behavior, and mood status be insulated from outside pressures and be governed by the criteria used for peer review. In the second case,

Professor Viel from France reported to the Ethics and Philosophy Committee being the target of job threats following publication of papers in the *British Medical Journal* on risks for cancer among seashore residents living near nuclear power plants. This investigator also reported pressures from the nuclear industry to reveal the identity of individuals whose health records were part of an epidemiologic study. The Ethics and Philosophy Committee convened an ad hoc subgroup, under the late Professor John Goldsmith, one of its founding members, which communicated with Professor Viel, and offered to provide moral support for the issues raised. In both the Needleman and Viel cases, the issues of concern were resolved, but it is not known whether and to what degree ISEE's response played a role. Both Needleman and Viel are well-known senior investigators who published their work in prestigious journals. Their situations are exceptions to the rule that most whistleblowers do not have the protection of status and seniority, their findings or warnings may not be particularly original, and they may be prevented from either from publishing their findings or completing investigations in progress.

Through 2001, ISEE has responded to two cases, that of Yoram Finkelstein and Omar Shafey, and is working on a third, that of a pathologist sent to prison in Belarus.

Discussion

The case studies above provide support for the hypothesis that powerful governmental, military, economic, and political interests are often the driving forces and the sources of legal and illegal harassment of environmental messengers and, at times, the institutions they work for. But most of the case reports are from Western countries with developed research cultures and codes for the protection of human rights. The high-risk settings for exposure to pressures against environmental scientists are those where research is most needed, i.e., where exposures and risks are severe, where there are few environmental scientists, and occupational safety and health is not properly regulated and enforced by law. The risks are increased where legal safeguards for human rights are weak, and where access to a free press is blocked.

Yet, data are not readily available to examine the working hypothesis that the exposure settings in which scientists are at greatest risk for threats,

harassment, and legal pressure are those in which they are most needed. Africa, Latin America, Asia, the Mid-east and Eastern Europe are the regions of the world with the worst environmental and occupational health problems, the fewest environmental scientists, and the weakest safeguards to protect the rights of investigators. The situation is probably the worst for physicians working in occupational medicine who serve remote populations, given their relatively low status on the professional totem pole. In many of these countries, the situation for environmental scientists parallels the situation with regard to human rights, and suppression bias, like poor working conditions, is accepted as part of the normal research environment. It therefore stands to reason that in these regions, the absence of information on harassment of researchers can almost be said to be evidence of the effectiveness of suppression bias as a deterrent to investigation of environmental hazards. So far, neither the ISEE nor the Collegium Ramazzini have received requests for help from these settings.

In the developed countries, we need to ask whether a more subtle institutional form of suppression bias could be taking hold. Academic institutions are entering into strategic business alliances, most often with biotechnology and pharmaceutical firms (32). The close ties between university and business are a frontal assault on the last vestiges of “academic freedom” of the faculty members. Moreover, the diminishing role of governments in funding public health research causes academic institutions to pursue corporate funding. This trend furthers the alliance of university and business, and increases the likelihood of suppression bias.

We suggest that suppression bias and the occurrence of environmental hazards circularly reinforce each other. Alibek has pointed out that in the former Soviet Union, suppression of information on health hazards to personnel and the environment from activities related to weaponizing bacterial and viral organisms for bioterrorism led to a scenario in which safety was jeopardized over and over again in the name of national security. He described a scenario in which suppression bias *resulting* from the harassment of epidemiologic messengers endangered public health (33).

Institutional safeguards against harassment in environmental science

Until now, research on ethics in environmental epidemiology has focused on the obligations of individual researchers to comply with norms of truth and not engage in scientific misconduct (34-35). But there has been insufficient discussion of the obligations of institutions to protect their workers and their findings from external harassment when their findings are embarrassing, costly, or threatening to powerful interests. Such harassment serves as a deterrent to investigating and reporting information about hazards and risks.

Measures to protect messengers in environmental and occupational epidemiology should be required of grant recipients of research contracts around the world and should become a worldwide institutional norm.

Messengers can be wrong

The statements made by epidemiologic messengers on the presence of a hazard or risk may be right or they may be wrong. We suggest that pressures, harassment, and abuse are no substitute for access to the peer-review process. At the same time, there is the need to be concerned about pressures on this peer review process by new trends in the academic world to forge alliances between industrial or technological interests and the research community.

What Next?

Professional societies derive their legitimacy from their mission in promoting the public good. Investigation and reporting environmental hazards and their risks are essential to prevent damage to public welfare. As we noted at the outset, the protection of epidemiologic messengers derives from the primacy of protecting public health. Ironically, Benthamite rationales—stretched somewhat—could have served to acquit Socrates were it to have been shown that his teachings were necessary for protection of the greatest good for the greatest number, or more fundamentally, for the health and welfare of all individuals, in keeping with traditions of the sanctity of preserving individual human life.

Organizations concerned with ethics in science in recent years rightfully called attention to the need to establish rigid standards for

preventing scientific misconduct by individuals. The first generation of work on ethics in research focused on setting standards, procedures and codes of practices which defined responsibilities of individual scientists at all levels, to work according to codes of truth, quality assurance and quality control, precision and accountability (36-37). This first generation of work addressed issues raised by whistleblower scientists who drew attention to scientific misconduct in the laboratories of their superiors. These episodes of misconduct led to the distortion of findings, failures in quality assurance and quality control, and lapses in precision and accountability. The issue at hand now is standards for preventing institutional misconduct. There has been no parallel effort of equivalent force to enact standards that prevent misconduct by institutions—be they the scientist's employer or other bodies—which results in harassment of epidemiologic messengers.

We suggest that failure to ensure proper access to independent peer review insulated from internal and external pressures is a form of institutional misconduct. The same statement applies to failure to provide protection against legal harassment, such as occurs with SLAPP lawsuits. Therefore, the second generation of work in ethics and scientific integrity has to deal with a new and different set of problems. These pertain to the need for standards, procedures, and codes of practice that define the responsibilities of institutions and organizations to prevent the harassment of individual environmental scientists who either attempt to investigate or report findings on hazard and risk which go against powerful interests that could be damaged by such information.

The issues at hand here are not quite the same as those having to do with investigations of scientific misconduct, i.e., the falsification or fabrication of research results. In investigations of scientific misconduct, there is a more or less level playing-field for right and wrong: the peer reviewed literature and its well elaborated codes and norms for evaluating scientific evidence. In the case of whistleblowing in environmental and occupational epidemiology, the problem is to promote access to this level playing field, and to ensure that the playing-field is indeed level. There is a need to ensure that outside interests, often commercial, economic or political, do not obstruct access to or distort the process of peer review.

There is a need to recognize a dissonance between the emphasis of the first generation of ethics on promotion of research integrity and that of the second on prevention of suppression bias. Often there is a two-stage scenario in which investigators— or officials in need of a rapid estimation of hazard or risk—are first blocked from access to the exposed populations and relevant databases, and then their reports are disqualified because they are incomplete, imperfect or imprecise. In short, the very criteria used to define the quality of investigation may serve as barriers to reporting its substance. This situation—in which being precisely wrong is considered preferable to being approximately right—is the classic scenario of delay.

One form of harassment of environmental epidemiologists and other investigators is to subject their databases and records to a battery of legal subpoenas. If transparency is our norm, it is hard to fault such challenges. However, such subpoenas pose potential challenges to the privacy of research on individuals, and may serve as a deterrent to their giving permission to use data on individual exposure and risk. But, in the case of environmental epidemiology and related fields, the ultimate form of harassment is to deny the investigator access to databases, so as to prevent a complete investigation. In epidemiology, in particular, barriers to accessing databases on denominators can be particularly devastating, because they effectively forestall precise calculations of risk. Such barriers, by delaying or impeding investigations, may not only block research, but they permit the persistence of situations hazardous to the health and safety of the populations themselves. We see use of the term “sound science” to disparage attempts to make do with limitations of estimates of risk based on studies not meeting “gold standard” requirements because data sets may not be complete (38).

A second form of harassment is lawsuits for libel. To address this hazard to environmental scientists, there is a need to explore the use of insurance policies modeled after those available to writers. Grants to environmental scientists should include budgeting for such insurance.

Conclusions

Until now, there has been no watchdog address for environmental and occupational epidemiologists to which to turn for assistance.

We suggest that major granting agencies follow the lead of ISEE and the Collegium Ramazzini in protecting environmental scientists from harassment. We call for studies on the impact of harassment of research scientists on the detection and prevention of health risk. We call for the development and use of codes for protecting environmental scientists from harassment when they are engaged in this mission. We recommend that measures to protect messengers in environmental and occupational epidemiology be required of recipients of research grants or contracts around the world. These codes should become a worldwide institutional norm. Codes that protect epidemiologic messengers in environmental and occupational medicine will serve also to protect the public health.

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ISEE Ethics Committee Epidemiologist Whistleblower/Messenger Questionnaire:

1. Personal status

- ISEE Member? Y/N _____; ISEA Member? Y/N _____; Age _____
- Gender M/F _____
- Personal Status: M, S, D, W _____
- Children (Give no _____)

Education	From	To	Where* (see Code)	Code
Undergrad	_____	_____	_____	America: NA, CA, LA
MD	_____	_____	_____	Europe: WestE, Med,
MPH/MSc/MS/MA	_____	_____	_____	EastE Mideast: ME
PhD/DPH	_____	_____	_____	Africa: WA, EA, SA Asia:
Post Doc	_____	_____	_____	Ind, CentAsia, Jp, Ch,
Residency Spec	_____	_____	_____	SEA Oceania: Aus, PI

2. Currently Employed

Where? _____ see code above
 By: Govt Civilian Military Police (Circle one)
 Level: National Regional/Province/District/Municipal (Circle one)
 University/College _____
 Independent research institute
 Foundation _____
 Trade Union NGO Self Employed
 Industry/Corporation: If yes? _____
 Multinational Y/N _____
 Other _____

3. Tenured or permanent? Y/N

Rank (Univ): Prof ___ Sr Lect/Lect ___ Asst ___ Other ___

4. Research/salary funded by: (Circle correct answer)

Government
 Industry
 Foundation
 Other
 No funding

5. Harassment: Following publication of research findings on health risks from environmental exposures, have **you** ever experienced:

Ostracism Y/N	Demotion Y/N	Criminal investigation/
		Prosecution/Trial Y/N
Confiscation of data Y/N	Loss of job Y/N	Physical threats Y/N
Threat of loss of job Y/N	Threats of lawsuits Y/N	Physical attack Y/N
Transfer Y/N	Lawsuits Y/N	Imprisonment Y/N
Other		

How many **other** co-researchers were there? ____ Did **they** experience any of the responses? Y/N

6. Research on specific problem which lead to episode(s) of harassment or threat of abuse:

Years during which research carried out: From _____ To _____

Was this research on the hazard/risk published in:

Peer reviewed journal (sited in SCI CIT INDEX) _____

Masters thesis _____

Doctorate _____

Internal document of organization in which you were then employed/studied?

Professional society _____

Non peer-reviewed journal _____

Other _____

Date of publication? _____ Would you be able to provide the Citation?

Leave blank if you wish _____

7. Response

7a. Did you receive **assistance** after being subject to any of the above problems?

Yes _____ No _____

7b. If yes, from: Individual colleagues ____ Superiors ____ Professional societies ____

NGO's inside country ____ Journalists/Media ____ Lawyers or legal aid groups ____

Colleagues outside country ____ NGO's outside country ____ Family ____

Other _____

8. Publication If findings were not published, were you **prevented** from submitting findings on health risks on a hazardous exposure/risk for publication in a peer reviewed journal?

Yes ____ No ____ OPTIONAL _____

9. Findings: Could you summarize the findings you discovered/reported for which you were harassed?

Study design (Cohort, CC, Prev, TS, Other)	Pop(s) / N	Exposure(s)	Outcome	RR/OR	Reference
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

10. In retrospect, were your findings: understated? ____ a proper assessment? ____ overstated? ____

For further information: <http://www.iseepi.org/ethguide.htm>