
Implementing Ethics in the Professions: Examples from Environmental Epidemiology*

Colin L. Soskolne^p and Lee E. Sieswerda^s

^p Faculty of Medicine and Dentistry, University of Alberta, Edmonton, Alberta, Canada

^s Thunder Bay District Health Unit, Thunder Bay, Ontario, Canada

Keywords: applied ethics, professional ethics, accountability, scientific misconduct, values, philosophy, incentive programs, innovation

ABSTRACT: *The need to integrate ethics into professional life, from the grassroots up, has been recognized, and a comprehensive ethics program has been proposed as a model. The model includes the four dimensions of: consensus building, ethics guidelines development and review, education, and implementation. The activities of the International Society for Environmental Epidemiology (ISEE) are presented as examples and compared with the proposed model. Several innovative activities are described and incentives for ethical professional conduct are highlighted. The examples are provided for emulation by other professional organizations in the hope that, thereby, greater protection of the public interest will be achieved.*

Introduction

Whether scientists form a group or a set of groups that could properly be called “professional” is largely dependent on three factors:

- whether they have established an autonomous system of self-regulation,
- whether they are governed by a code of ethics, including aspects of social responsibility and devotion to the public good, and
- whether they have a specific and substantial body of knowledge.¹

* An earlier version of this paper was presented at the AAAS-Office of Research Integrity (ORI) meeting in Washington DC on the theme: “The Role and Activities of Scientific Societies in Promoting Research Integrity” held on April 10-11, 2000.

Address for correspondence: Dr. Colin L. Soskolne, Department of Public Health Sciences, University of Alberta, 13-103 Clinical Sciences Building, Edmonton, Alberta, CANADA T6G 2G3; email: colin.soskolne@ualberta.ca

Paper received, 9 January 2001; revised, 10 September 2002; accepted, 24 February 2003.

1353-3452 © 2003 Opragen Publications, POB 54, Guildford GU1 2YF, UK. <http://www.opragen.co.uk>

With regard to the last criterion, we accept that each scientific specialty has claim to a specific and substantial body of knowledge and so will not argue this point here.

Unlike the more traditional professions of medicine, law, and engineering, scientists do not have a legally recognized self-regulating body that controls the license to practice. Nevertheless, science has an organically derived set of principles that governs how “good” science is to be done. A less formal expectation of self-regulation is permitted. Too much control over science, it could be argued, has the potential to stifle creativity and independence, and hence to undermine the advancement of science. Thus, enforcement of these scientific standards tends to be limited to peer review and peer pressure, to a greater or lesser degree, throughout the scientific community, worldwide.

In theory, and largely in practice, peer review ensures that only those studies adhering to the strict principles of science are published in reputable journals. In this regard, science is well-served by peer review. In addition to publication in scientific journals, the exchange of current information is facilitated through scientific meetings. Professional organizations of all kinds take full advantage of this type of environment for the vigorous and critical exchange of new ideas and developments in their respective fields. Self-regulation is achieved in science via a strong culture of criticism and review by peers, especially on issues of scientific validity, both in reputable publications and whenever scientists congregate.

Beyond the scientific standards for validity that we have come to expect, the professionalism of science requires that ethics guidelines (or, codes of ethics) be developed and promulgated by scientific organizations. The question of ethics, especially of broader ethical issues such as social responsibility, is not as readily discussed as are issues of scientific validity. Efforts are underway to make ethics discussion a more accepted and organic part of the daily lives of scientists. For example, the American Association for the Advancement of Science (AAAS) promotes scientific integrity among all scientists through its Program on Scientific Freedom, Responsibility and Law. Many scientific disciplines have developed their own specialty-specific codes of ethics.^{2, 3}

Across disciplinary boundaries, important ethical resolutions have gained acceptance. For example, the Helsinki Declaration⁴ now serves as the worldwide model for the treatment of humans in scientific research. The Toronto Resolution^{5, 6} has provided a model for incorporating a broader sense of social responsibility, including ecological stewardship, into scientific codes of ethics.

The purpose of this paper is to share the progress of the International Society for Environmental Epidemiology (ISEE) in its movement towards a comprehensive ethics program. In particular, we will describe ISEE’s ethics infrastructure, incentives for ethical conduct, its procedure to provide support to victimized colleagues, as well as a unique innovation in the discussion of ethical issues at the ISEE annual 1996 conference. In 1996, ISEE had a membership of almost 500, and has since grown to over 800. Some aspects of ISEE’s ethics program described below could serve as examples that other scientific specialty organizations may wish to emulate.

Towards a Comprehensive Ethics Program

In an earlier paper,⁷ we discussed a structure for an integrated and comprehensive ethics program for epidemiology. Although initially developed for our own specialty, the structure may be general enough to apply without alteration to other scientific organizations. In essence, such a program should contain four broad elements. First, it must have a consultative process by which members are able to develop consensus on their professional values and beliefs. This consensus-building process must culminate in the second element of the program: a set of statements that articulate the group's norms of professional conduct in the form of a code of ethics. Usually, this document governs the conduct of the profession and serves as that standard against which the profession and the professional can be held accountable. Other documents (such as a set of standards of practice) and procedures also may be included that help to facilitate practice of the profession's norms. The third element is a process by which the profession's ethics are passed on to the next generation, socializing future generations of students as to the profession's values and norms of conduct. Finally, some process for implementation must exist to facilitate the program and to minimize the risk of contravention of the profession's normative ethical standards. A discussion of the notion of "enforcement" is controversial and beyond the scope of this paper. The notion of enforcement is one to which science has been resistant. Within medicine, for example, a license to practice is controlled by national medical boards consisting entirely of peers. In 1980, early attempts by the American College of Epidemiology to implement licensing requirements for the practice of epidemiology were largely ignored⁸ and were subsequently dropped. Nonetheless, we believe that peer pressure in the presence of normative guidelines is regarded as affording a reasonable level of control and hence of professional accountability.

Consultative process

In 1991, the ISEE established its Standing Committee on Ethics and Philosophy. Following the establishment of the Committee, a consultative process was launched to survey the state of ethics in environmental epidemiology with the ultimate goal of drafting consensus core values and ethics guidelines. A worldwide survey of environmental epidemiologists and other related disciplines was conducted and the results⁹ were incorporated into a set of published proceedings.¹⁰ Several symposia and workshops were organized by the Ethics and Philosophy Committee to both educate and accept input from epidemiologists, as well as from disciplines related to epidemiology, the scientific community in general (through the AAAS), legal experts and professional ethicists, and other stakeholders. These proceedings also were published.¹¹ The substantial period of time allocated to developing guidelines and the extensive consultative, multidisciplinary process for obtaining broad input and consensus were seen as key elements for the long-term success of the ISEE's ethics program. In all, this process took about 7 years and culminated in the formal adoption of ethics guidelines in 1999.

With the official adoption of the draft guidelines in 1999, a new phase of the consultative process is being developed. Surveys of the membership are to be conducted to assess the state of consensus on ethical issues approximately every 10 years. The goal of these surveys is to incorporate the evolving values of the profession into the adopted ethics guidelines. Examples of new areas of concern include rapid developments in biotechnology and genetics, and environmental impacts associated with globalization. One particular method that we have adopted and discuss below is to engage the grassroots membership at the ISEE's annual conferences through symposia and innovative activities.

Ethics guidelines, other documents and procedures

The core component of the ISEE's ethics program is its ethics guidelines. These emerged after a series of developmental activities and consultative initiatives within the sub-specialty of environmental epidemiology. The draft guidelines were first published in 1996.¹² They were formally adopted in 1999 after three years of dissemination via the ISEE's official journal and web site, and review by the membership. To our knowledge, this was the first such formal adoption of ethics guidelines within any sub-specialty of the profession of epidemiology.

One of the guidelines states, "the environmental epidemiologist has an obligation to... encourage the repudiation of improper activities." To further this goal, the ISEE has adopted a method to help protect students and colleagues from pressures that attempt to prevent the study of questions in which vested interests have a stake in maintaining the status quo.¹³ In 1999, ISEE adopted a procedure to protect victimized colleagues (accessible at: <http://www.iseepi.org/ethguide.htm>).¹⁴ The procedure is one that draws on active members of the Ethics and Philosophy Committee who, according to the 8-step procedure, will provide moral or other support from the Society. This support is designed to ensure a victimized colleague's right to be heard, recognizing that the position of the victimized environmental scientist, subjected to pressures to remain silent, may or may not be defensible. It is the right to be heard that the ISEE procedure is designed to protect. When warranted, the President of the ISEE could write a letter of inquiry or support, could write an *amicus curiae* (friend of the court) brief, or could encourage the membership to take some kind of action on behalf of an unfairly beleaguered environmental health scientist or a student of any related discipline. This support could come regardless of whether or not the person is a member of the Society, and regardless of his or her professional stature.

Additionally, at its Twelfth Annual Conference held in Buffalo, New York in 2000, an award was established to recognize integrity in the face of unusual pressure from special interests while conducting environmental epidemiology research. This award is described on the same web site¹⁴ and serves as a vehicle for the recognition of those who have resisted unusually strong pressure and instead conducted their research with integrity. As noted in the Award: "The field of environmental epidemiology often touches on issues that have policy implications. Thus, our research may affect or be perceived to affect parties with vested interests, either social or financial. For these reasons, epidemiologists may be subjected to pressures that run counter to the goals of

scientific endeavors designed to provide understanding of the environmental influences on human health. In this context, The ISEE Research Integrity Award has been established to honor environmental epidemiologists who protect public health above any other interest.”

An Educational Innovation: Discussing Ethics at the Grassroots

The ethics committees of various epidemiology major and sub-specialty organizations have, since they first began to examine issues of ethics training in the profession, called for grassroots engagement in discussions about ethics. Grassroots would include students and trainees of the profession – the next generation of professionals. Forums for such engagement have traditionally assumed the written pages of the professional literature. However, face-to-face discussion among colleagues, as at conferences, has been an under-utilized method of promoting ethics among working scientists and students of the profession.

In 1996, the ISEE held its eighth annual conference at the University of Alberta in Edmonton, Canada. This annual event is a scientific conference of environmental epidemiologists from around the world. Delegates attended from 47 countries. The first author (CS), as local host, decided that this meeting would provide the testing ground for an innovation in the grassroots discussion of current issues of ethical significance.

To achieve this goal, in fifteen of the twenty-nine concurrent oral presentation sessions, 15 to 30 minutes were scheduled at the end for a moderated discussion of the ethical implications of the preceding presentations, or of the topic area in general. The moderator, an environmental epidemiologist with experience in applied ethics, was to listen to the preceding presentations and then facilitate ethics discussion among the session attendees. No agenda was set beforehand, but was left to the discretion of the moderator.

Because this was an innovation at ISEE conferences, it was decided in the planning stages that an evaluation questionnaire would be developed to assess the conference participants’ reactions. This questionnaire was included in the materials provided to each delegate upon registration at the conference. In the pre-conference mailings and in the preliminary conference scientific program, the fact that sessions on “values, ethics and philosophy” would be taking place was advertised as an innovation on the traditional conference format.¹⁵ The designated ethics sessions were flagged in the pre-mailed and final scientific program materials. Participants’ attention was also drawn to the ethics sessions at each of the conference’s daily plenary sessions and at all other group events, and to the fact that an evaluation questionnaire should be completed. However, the questionnaires were returned voluntarily and were not systematically solicited.

It should be noted that it is likely that a conference participant willing to complete and return a questionnaire with regard to these ethics sessions might differ systematically from a conference participant not willing to do so. We have not attempted to quantify the magnitude or direction of this potential bias. Of 414 people who attended the conference, 146 completed at least a portion of the ethics evaluation,

providing a 35% response rate. In the Table, the results of the questionnaire analysis are presented.

Table. Analysis of ethics session evaluation questionnaire responses

Question	% affirmative answers*
1. I was made well aware of the ethics discussions.	68 [60,76]
2. I attended at least one of these ethics discussions.	79 [71,85]
3. If you attended at least one session:	
a) Did you find the ethics discussion useful?	71 [62,80]
b) Would you recommend repeating the ethics discussions at future conferences?	88 [80,93]
c) Should the ISEE Standing Committee on Ethics and Philosophy continue trying to promote awareness of ethics within the profession?	96 [91,99]

* The numbers in brackets are the 95% confidence intervals.

Our first concern was whether or not we had successfully communicated to the conference participants that ethics discussion sessions would indeed occur. As mentioned above, the ethics sessions were “advertised” in the conference program and at all group events. With these repeated reminders, 68% of respondents indicated that they were aware that these sessions would take place. A greater percentage became aware of their existence as 79% attended at least one ethics discussion.

Question 3, with its three parts, was asked only of those respondents who had attended an ethics discussion session. Of these people, 71% of the respondents indicated that the exercise was useful, 12% indicated that it was wasteful, and 17% were undecided.

Of the 12% of respondents who believed that the ethics sessions were wasteful, 44% believed that it was because the whole exercise was ill-conceived, and 81% believed that it was related to the ethics facilitator (not shown in the Table). Thus, of all those who attended an ethics discussion session, only about 5% thought that the idea of discussing ethics in this format was ill-conceived. The people who were asked to serve as facilitators were all respected individuals in the field of environmental epidemiology and with notable experience in ethics. Nevertheless, the results of our survey suggest that facilitators may require some advance preparation. Those who would organize such events are therefore recommended to prepare a package of sample ethics discussion questions and background material to aid facilitators in initiating and sustaining discussion.

The central value of this exercise (i.e., that of discussing ethics as an integral part of the scientific content) was identified when we asked respondents if they would recommend that these discussions be repeated at future ISEE conferences. A sizeable majority of 88% responded in the affirmative.

Finally, we asked whether or not the ISEE Standing Committee on Ethics and Philosophy should continue trying to promote awareness of the underlying values and ethics of the profession. To this question, 96% answered in the affirmative. With such strong support for the promotion of ethics, it is highly suggestive that the ISEE has a mandate, at least from conference delegates, to continue to develop and implement its ethics program.

It is noteworthy that at subsequent annual meetings of the ISEE, delegates informally mentioned (to CS) how much they had appreciated the ethics innovation that had been incorporated into the 1996 ISEE conference held in Edmonton. Such anecdotal support stands in stark contrast to no negative feedback. Unfortunately, however, this innovation has not been repeated at subsequent ISEE conferences. We do not believe that the increased size of ISEE since 1996 is responsible, since we believe that ethics discussions could easily be accommodated with, and indeed may benefit from, larger audiences. Rather, there has been an apparent lack of stimulus from the local organizers. We anticipate that the publication of this paper will provide both encouragement and the needed help to local conference organizers for integrating this “ethics innovation” into the scientific program that they put together.

Unfinished business: Formal Education and Implementation Issues

While the ISEE has made substantial strides towards including all identified facets of a comprehensive ethics program, it still has some way to go before its ethics program could be considered fully comprehensive. A set of consensus ethics guidelines has been promulgated and a consultative process is in place for updating them. However, the ISEE has no formal mechanism as yet for passing the values and ethics of the profession to the next generation of students other than through access to its web site and ad hoc encouragement to use them in training programs.

Exposure to ethics discussions at annual conferences can serve to reinforce formal ethics training. Goodman and Prineas also have identified core elements of an ethics curriculum.¹⁶ This aspect of ethics and philosophy in epidemiology, however, is in its adolescence, and it continues to gain acceptance as a legitimate and necessary component for socializing students as professionals.^{3, 17, 18} Indeed, until recently, only a few courses had existed in public health ethics. Coughlin and colleagues¹⁹ published a survey of US schools of public health. They found that only one school required ethics instruction for all students. Encouragingly, however, most schools (79%) offered a course, seminar series, or invited lecture series on ethics. Almost all (96%) had lectures on ethics in other courses. Additionally, some efforts have been made outside of academia to encourage the teaching of ethics and moral reasoning in epidemiology and public health, including the publication by the American Public Health Association of a book on case studies in public health ethics.²⁰ The US Public Health Service (USPHS) developed a Policy on Instruction in the Responsible Conduct of Research that required USPHS grantees to have taken a course in research ethics, although this policy was subsequently suspended (see <http://ori.dhhs.gov/html/programs/finalpolicy.asp>).

Conclusions

Whether having a comprehensive ethics (and philosophy) program in place results in greater ethical conduct on the part of ISEE members remains unknown. Implementing an ethics program is done more in the hope that it helps, but mainly to be transparent in our values and principles and accountable for our actions collectively and individually.

In terms of ethics development and the integration of this topic at the grassroots, we do not believe that the ISEE is unique in this regard, nor do we think that ethics discussions among scientists are peculiar to epidemiology. It seems likely, rather, that most other scientific disciplines would benefit from annual or periodic exercises that integrate ethics discussions at their periodic conferences.

This paper suggests that infrastructure to facilitate the development and introduction of a comprehensive ethics program into any particular professional organization is needed if the public interest is to be optimally protected. This suggestion is put forward to provoke discussion on this matter. The example of the ISEE could not have succeeded without the voluntary effort of active members of the profession enjoying the support of the elected officers. If infrastructure and incentives for such efforts were made available in the professions, the approaches taken by ISEE likely would be able to be implemented more painlessly by others in the future.

Professional and academic scientists have a special role and responsibility to promote research integrity. As teachers, researchers, and mentors of students and postdoctoral fellows, we hold a great responsibility to foster and promote research integrity. As with the case of parents and children, we must establish and promote a consistent set of guidelines for behavior. Our students and postdoctoral fellows will emulate our behavior. They will be sensitive to our consistent behavior. On the other hand, inappropriate behavior also will be emulated. That is why parents and educators have roles with such a weight of moral responsibility. We are training the next generation. We must strive to pass on to them a moral compass based on consistent and just behavior.²¹

Acknowledgements: The American Association for the Advancement of Science (AAAS), through the Program on Scientific Freedom, Responsibility and Law, headed by Mark S. Frankel, made possible Colin L. Soskolne's presentation at the April 10-11, 2000 AAAS-Office of Research Integrity (ORI) meeting in Washington DC on the theme: "The Role and Activities of Scientific Societies in Promoting Research Integrity". The title of his presentation was: "Implementing ethics in the professions".

The International Society for Environmental Epidemiology (ISEE) would not have moved forward with its comprehensive ethics program without the ongoing support and encouragement of its successive Presidents, Councilors and, of course, the members of the Ethics and Philosophy Committee.

REFERENCES

1. Sohl P, Bassford HA. (1986) Codes of medical ethics: traditional foundations and contemporary practice. *Social Science and Medicine* **22**: 1175-1179.
2. Chalk R, Frankel MS, Chafer SB. (1980) *AAAS Professional Ethics Project: professional ethics activities in the science and engineering societies*. American Association for the Advancement of Science, Washington, DC. AAAS publication no. 80-R-4.
3. Soskolne CL. (1989) Epidemiology: Questions of science, ethics, morality, and law. *American Journal of Epidemiology* **129**(1): 1-18.
4. World Medical Association. (2002) *World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects*. Ferney-Voltaire: WMA. www.wma.net/e/policy/17-c_e.html (accessed 26 February 2003).
5. Fawcett E. (1993) Working group on ethical considerations in science and scholarship. *Accountability in Research* **3**: 69-72.
6. Summers C, Soskolne CL, Gotlieb C, Fawcett E, McClusky P. (1995) Do scientific and scholarly codes of ethics take social issues into account? *Accountability in Research* **4**: 57-68.
7. Soskolne CL, Sieswerda LE. (1998) Implementing ethics in the professions: toward ecological integrity. *Ecosystem Health* **4**(2): 109-118.
8. Anonymous. (1990) The decade in epidemiology. *The Epidemiology Monitor* **11**(6): 1-2.
9. Soskolne CL, Jhangri GS, Hunter B, Close M. (1996) Interim report on the Joint International Society for Environmental Epidemiology (ISEE) – Global Environmental Epidemiology Network (GEENET) ethics survey. *The Science of the Total Environment* **184**(1,2): 5-11.
10. Soskolne CL and Bertollini R. (Eds.). (1996) Ethical and philosophical issues in environmental epidemiology. *The Science of the Total Environment* **184**(1,2): 1-147.
11. Soskolne CL. (Ed). (1993) Proceedings of the symposium on ethics and law in environmental epidemiology. *Journal of Exposure Analysis and Environmental Epidemiology* **3**(Suppl 1): 243-319.
12. Soskolne CL, Light A. (1996) Towards ethics guidelines for environmental epidemiologists. *The Science of the Total Environment* **184**(1,2): 137-147.
13. Richter E, Soskolne CL, LaDou J. (2001) Efforts to stop repression bias by protecting whistleblowers. *International Journal of Occupational and Environmental Health* **7**(1): 68-71.
14. ISEE web site for ethics-related content: <http://www.iseepi.org/ethguide.htm>.
15. Anonymous. (1996) ISEE Book of Conference Abstracts. *Epidemiology* **7**(4): S17.
16. Goodman KW, Prineas RJ. (1998) Toward an ethics curriculum in epidemiology, in Coughlin SS, Beauchamp TL (eds.) *Ethics and Epidemiology*, pp.290-303. Oxford University Press, New York.
17. Coughlin SS, Etheredge GD. (1995) On the need for ethics curricula in epidemiology. *Epidemiology* **6**:566-567.
18. Rossignol AM, Goodmonson S. (1995) Are ethical topics in epidemiology included in the graduate epidemiology curricula? *American Journal of Epidemiology* **142**: 1265-1268.

19. Coughlin SS, Katz WH, Mattison DR. (1999) Ethics instruction at schools of public health in the United States. Association of Schools of Public Health Education Committee. *Am J Public Health* **89**(5): 768-770.
20. Coughlin SS, Soskolne CL, Goodman KW. (1997) *Case Studies in Public Health Ethics*. Washington, D.C.: American Public Health Association.
21. Personal Communication: Barry R. Masters, PhD, Fellow of the SPIE, 1999-2000 AAAS Congressional Science Fellow, Washington, D.C.