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On: 15 September 2013, At: 09:22

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Archives of Environmental & Occupational Health

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/vaeh20>

The Literature of Environmental and Occupational Health (EOH) I. Appreciating Diversity in the Literature of EOH

Tee L. Guidotti MD, MPH, DABT ^a

^a Archives of Environmental & Occupational Health

Published online: 07 Aug 2010.

To cite this article: Tee L. Guidotti MD, MPH, DABT (2006) The Literature of Environmental and Occupational Health (EOH) I. Appreciating Diversity in the Literature of EOH, Archives of Environmental & Occupational Health, 61:2, 51-52, DOI: [10.3200/AEOH.61.2.51-52](https://doi.org/10.3200/AEOH.61.2.51-52)

To link to this article: <http://dx.doi.org/10.3200/AEOH.61.2.51-52>

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Editorial

The Literature of Environmental and Occupational Health (EOH) I. Appreciating Diversity in the Literature of EOH

Other intellectual fields have it easy. Chemists know what chemistry is and how to write an article for a chemistry journal. The editor of the *Journal of Physical Chemistry* seldom has to worry about a manuscript with a philosophical bent and no data. The editors of *Physical Review Letters* rarely have to referee a manuscript in which the authors discuss the policy implications of string theory.

Things are a little more challenging for us in the environmental and occupational health (EOH) field. The EOH literature is an extreme case study of the diversity of written scholarly expression. EOH is a classic boundary discipline (what used to be called, in German, a *Grenzgebiete*). It is developed to its fullest when a scientific problem falls at the interface of other scientific disciplines, such as chemistry, biology, medicine, and epidemiology. As a practical discipline, problem solving requires consideration of political sciences (disguised as policy analysis), risk science, methodology, history, past experience as related in case studies, and, increasingly, law and economics. Therefore, the EOH literature reflects many traditions, and it is small wonder that EOH journals show more diversity than do those in other disciplines. For an editor, this presents a challenge but still nothing that a good reviewer database and the Vancouver Convention for uniform formatting cannot handle.

The more one scrutinizes the literature, the more one sees that stereotypical scientific writing has its limitations. The classical formats of scientific research, the original research article and the review article (and, in medicine, the case study, which is now out of favor), are not sufficient for our purpose. We have been too rigid and too limiting to insist that there are only these 2 types of scientific articles in scientific and medical publishing. Other forms of scholarship in our field are perfectly legitimate. There is room for greater diversity in the world of journal publishing.

EOH cries out for articles that integrate concepts across fields and whose authors rigorously discuss policy implications, examine methodological limitations, compare theory with practice, put issues in context, explain how a theory or point of view came into being, and propose a new hypothesis or method and ways to test (falsify) them. These are all legitimate forms of scholarship and valuable to the enterprise of EOH science.

The traditional scientific article formats, or *genres* (to use a literary term), are not the only 2 possible formats for a worthwhile article. Each evolved for a particular purpose, and each has its own history and conventions. In subsequent editorials, I plan to take a fresh look at research articles, reviews, and case reports.

The remainder of this editorial, however, will discuss other genres, or types, of manuscripts of interest to us in EOH. These genres are of great value in our discipline but do not receive the same attention as do original contributions and review articles. They are treated as exceptions, and there may be a strong bias against them on the part of editors and reviewers accustomed to more traditional formats.

Policy analysis. Policy analysis may not be considered proper, empirical science, but it is an integral part of our scholarship. Policy studies draw heavily on political science, where the traditional means of analysis has been case studies, and on economics, where the usual approach has been modeling. (Economics has become more empirical and diverse in recent years.) A detailed policy analysis, applying scientific findings to a practical issue, is a legitimate undertaking for investigators familiar with a complicated problem. It is a good means of influencing public policy and guiding it through the thicket of competing claims. Policy analysis must begin with sound scientific analysis. If the science is right, there is no guarantee that the policy will be

right, but there is a better chance that it will be. If the science is wrong, then the policy will always come out wrong because even if the right decision is chosen for the wrong reason, it will be impossible to defend. A sound policy analysis, placed in the peer-reviewed literature can be enormously influential—assuming that it is published in the right place, at the right time, and attention is paid by the right people.

Policy articles require as much structure as a technical article and attention to basic elements: why is this issue a(n) international/national/regional problem, who is affected, how big is the adverse impact and how is that distributed, why is the issue peaking or being discussed now, who or what is responsible, what options are available for intervention, how big an impact will an option for intervention have, how much cost will be incurred if the worst happens, how much will it cost to fix the problem, and who should take responsibility for the solution?

The author of a policy article has to exercise judgment in how widely the discussion should range. Every problem has a context, but where does the context end? Is an environmental exposure a regulatory issue? Is the regulatory issue embedded in a political framework? Does the political framework reflect a broader historical trend? Does the exposure have implications for the evolution of the human species? Are the economic limitations big or little? For whom? Is the issue connected to environmental or economic sustainability? To the survival of the universe? Where does one stop?

Risk assessment. Formal, quantitative risk assessment methodology is a way of structuring and formatting these elements and quantifying the results of the analysis. Risk assessment is an immensely valuable approach to the problem, but it has intrinsic limitations. It is an extrapolation, necessarily imprecise, with many assumptions. Perhaps its greatest value is not in revealing or predicting what will happen but in forcing a disciplined and rigorous analysis, without shortcuts, so that all the relevant issues are thoroughly considered. Within the broad field of risk science there are sub-fields, such as risk perception studies, that apply principles of disciplines, such as social psychology, to achieve new and rather basic insights into how people process information about risks and cope with its meaning for themselves, their families, and their communities. Such studies have obvious relevance to EOH and belong in its literature.

Methodology. Methodological articles in which authors propose, define limits to, or critique established methods can be valuable. Fletcher's¹ seminal article, in which he demonstrated why smoking, as a confounder, fails to explain elevated cancer risk in most occupations, is a classic example. The editors of *Epidemiology* choose these articles with great care and should serve as a model.

The imperatives of describing a methodological problem demand that the author lay out why the methodological issue is important, what type of bias or error it may introduce, how widespread a problem it may be, ways to identify the

problem, and what alternative methods can be applied. Those imperatives of an article in which the authors describe a new approach demand that they lay out why existing methods fall short, the derivation of the proposed solution, the application of the solution, a demonstration that it works, guidance on software, and a detailed description of the new method's limitations. Anything short of this, for either type of methodological article, renders the article less useful than it could be and sometimes misleading.

An author does not have to write a methodological article on the basis of the data from an actual study. Methodology articles often include dummy data sets that illustrate important points. However, when the authors do use the data from the study, they are exempted from the usual concerns over dual, or *salami*, publication (ie, when a series of articles draw from the same study, in which the authors examine only a small slice of a much larger data set, like cutting a slice of salami). Salami publication is bad because it is so obviously an effort to create more publications than the data should support: Each publication is out of context, and, taken together, the total study is usually less than the sum of its published parts. Researchers who conduct methodological studies on the basis of existing data sets are intending to illustrate some feature or limitation of the methods, not to tease new information from the data.

History. Historical articles lend background and perspective and often illuminate the context of research and the history of ideas. In EOH, as in other fields, it is important to benchmark how far we have come, how ideas have come about, and what mistakes we do not have to make again if we pay attention to history. The editors of both the *Journal of the Royal Society of Medicine* (UK) and the *American Journal of Public Health* do these types of articles extremely well.

For the editor of a journal, diversity in the types of articles submitted means more trouble. However, the richness of the material that results and the challenge of changing intellectual approaches more than makes up for it. In EOH, with our rich intellectual heritage drawn from many scientific fields, we embrace diversity in our literature and appreciate how different scientific and intellectual traditions bring their unique insights to complicated problems.

Tee L. Guidotti, MD, MPH, DABT

Editor in Chief

Archives of Environmental & Occupational Health

For comments or further information, address correspondence to Dr. Tee L. Guidotti, 2100 M St. NW, Suite 203, Washington DC 20052.
E-mail: eohtlg@gwumc.edu

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