

[Editorial]

Methodologic Guidelines for Review Papers

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Reading a good review paper is one of the most efficient ways of becoming familiar with state-of-the-art research and practice on any topic in cancer biology, epidemiology, prevention, or treatment. Yet, what constitutes a good review? It must be clearly organized, recently written by a knowledgeable (ex-pert) scientist, and describe a topic appropriate to the general readership of the *Journal of the National Cancer Institute*. A 10-year methodologic discussion, however, suggests that there is more to the quality of reviews than judgments about writing style, author's expertise, and choice of topic (1-18). Review papers are sources of scientific information and should be read (and written) with specific methodologic considerations in mind. The purpose of this editorial is to propose a set of guidelines for reviews submitted to the *Journal*, a general oncology journal.

Background

Methodologic guidelines for review papers (and the related issue of quality) have been discussed in several journals, including in alphabetical order:

American Journal of Preventive Medicine (8)
Annals of Internal Medicine (3)
Annals of the New York Academy of Science (12)
British Medical Journal (9,15-17)
Canadian Family Physician (11)
Canadian Medical Association Journal (2,4,5)
Journal of the American Medical Association (18)
Journal of Clinical Epidemiology (6,7)
Journal of Epidemiology and Community Health (10,14)
Otolaryngology—Head and Neck Surgery (13)

These discussions reflect a historical trend on the part of journal editors to improve the quality of reviews (8). This trend is traceable to Light and Pillemer's (1) classic book and to a study published in 1987 showing that 50 randomly selected re-view papers published in four prominent American medical journals (*Annals of Internal Medicine*, *Archives of Internal Medicine*, *Journal of the American Medical Association*, and *New England Journal of Medicine*) did not use scientific methods in the identification, assessment, and synthesis of information (3). Some journals now require a description of methods used in preparing a review or a structured abstract (8,11,13). In general, methodologic guidelines — whether required or suggested — provide an objective basis on which editors and referees can judge submissions of review papers to journals (8). Guidelines also help readers assess the extent

to which the information in reviews is complete and unbiased and if the research and/or practice recommendations made by the author(s) of the review are reasonable (8).

Guidelines

The following guidelines are recommended for authors submitting reviews to this *Journal* and may also be useful for editors, referees, and readers in their assessment of the quality of submitted and published reviews.

Statement of Purpose

A review paper should include a clearly stated purpose in terms of questions to be answered or goals to be met. Noting that the purpose is to review a topic is insufficient. Reviews summarize evidence for several possible purposes including, but not limited to, making research recommendations, making causal conclusions, or making public health or medical practice recommendations. Not all purposes are appropriate for a given review, but all reviews should include a clear statement of purpose.

Search Methods and Inclusion/Exclusion Criteria

A review paper should describe the information sources searched. Computerized and manual databases, such as Medline, CANCELIT, Index Medicus, and Current Contents, are typical examples. Other sources include reprint files and reference lists in books or published papers. In addition, a review paper should describe the inclusion criteria used in selecting the papers cited. Inclusions (and therefore exclusions) can be made on the basis of time period (e.g., papers published after 1990), type of publication (e.g., peer-reviewed, published, in press, abstracts, and proceedings), and by language (e.g., English). Inclusions may also be made on the basis of study design (e.g., observational/ epidemiologic studies), topic (e.g., specific exposure-cancer association or class of chemotherapeutic agent), and by population studied (e.g., Hispanics, women, or animal models). Once these inclusion criteria are described, a review article may specify the number of studies identified by the search methods and the proportion selected for review. The reader of any review should have a clear idea of the search techniques used, what evidence was assessed, and what evidence was excluded.

Criteria for Evaluating Validity (or Quality) of Studies

A review paper should describe the criteria used to evaluate the quality of the evidence. There are many examples of such January 1, 1997 criteria: some applicable to specific design types, such as case-control studies, some applicable to a broader set of study designs (such as the hierarchy of evidence (19) used by the U.S. Preventive Services Task Force or Physician's Data Query of the National Cancer Institute), and some applicable to types of biologic evidence (such as those used by the International Agency for Research on Cancer). Authors of reviews may wish to state

their own criteria, including, but not limited to, sample size, laboratory and/or statistical methods, measurement error, confounding and other forms of bias, and statistical significance or confidence limits.

Methods for Summarizing Evidence

A review paper should describe the methods used for summarizing the evidence from the studies selected for review. These may range from simple narrative techniques to highly structured quantitative techniques, such as meta-analysis.

Criteria for Conclusions and Recommendations

A review paper should describe the methods used to make conclusions. For example, if causal (or preventive) conclusions are a stated purpose of the review of epidemiologic evidence, then inferential methods, such as those published by the Surgeon General's Office or by Austin Bradford Hill or others (20), should be stated. If public health or medical practice recommendations are a stated purpose of the review, then the methods used to make those recommendations should be clearly stated. In addition, there should be a discussion of the extent to which economic, ethical, and pragmatic considerations were used in arriving at the recommendations.

Role of Methodologic Guidelines

The primary purpose of these guidelines is to ensure that readers (including editors and referees) are informed about the methods used in preparing the review. Readers can then better assess the quality of the paper and not judge it solely on the basis of writing style, author's expertise, appropriateness of the topic, or other implicit criteria. Recommending that authors disclose their methods, however, is not the same as judging the appropriateness of the methods used. A wide range of methods is used in reviews, some more quantitative while others are more qualitative. Indeed, disclosing which methods are used may stimulate readers and authors to examine methodologic research issues, such as the predictability, reliability, and validity of search methods or methods of summarizing evidence. Ultimately, methodologic research on such issues could lead to an improvement in the overall quality of review papers.

Generalizability of Guidelines

The Journal of the National Cancer Institute publishes reviews from many areas within the broad topic of oncology, including reviews on biology, epidemiology, prevention, and treatment. Nevertheless, the methodologic guidelines described above are applicable to any review submitted to the Journal. The only methodologic requirements are for authors to state the purpose of the review beyond "reviewing the evidence" and to state what methods were used in preparing the review. There is no

requirement to use a particular method. Thus, these guidelines are generalizable to any review as long as the author of that review can state the purpose of the paper and can describe the search techniques, the studies included and excluded, the review author's approach to assessing the validity of studies, and the methods used to summarize evidence and make recommendations.

Resistance to Change Within the Scientific Community

Although these guidelines are generalizable in principle to any review in the field of general oncology, some resistance to this proposal may be encountered. Change is often difficult for members of the scientific community, especially in situations in which there appears to be a challenge to the expertise of scientists and clinicians who, by virtue of that expertise, write reviews. However, no such challenge is intended. Rather, the only challenge found in this paper is for scientists to disclose the methods that they used to prepare reviews. Such disclosure (and the methodologic research it encourages) will eventually result in an improvement in the quality of reviews and thus an improvement in the quality of the Journal.

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