Book citations: influence of epidemiologic thought in the academic community

Citações de livros: influência do pensamento epidemiológico na comunidade acadêmica

ABSTRACT

Whilst their ‘death’ has often been certified, books remain highly important to most professions and academic disciplines. Analyses of citations received by epidemiologic texts may complement other views on epidemiology. The objective was to assess the number of citations received by some books of epidemiology and public health, as a first step towards studying the influence of epidemiological thought and thinking in academia. For this purpose, Institute for Scientific Information/Thomson Scientific - Web of Science/ Web of Knowledgedatabase was consulted, in May 2006. The book by Rothman & Greenland appeared to have received the highest number of citations overall (over 8,000) and per year. The books by Kleinbaum et al, and by Breslow & Day received around 5,000 citations. In terms of citations per year the book by Sackett et al ranks 3rd, and the one by Rose, 4th of those included in this preliminary study. Other books which were influential in the classrooms collected comparatively less citations. Results offer a rich picture of the academic influences and trends of epidemiologic methods and reasoning on public health, clinical medicine and the other health, life and social sciences. They may contribute to assess epidemiologists’ efforts to demarcate epidemiology and to assert epistemic authority, and to analyze some historical influences of economic, social and political forces on epidemiological research.


RESUMO

Ainda que sua ‘morte’ tenha sido freqüentemente certificada, os livros continuam sendo relevantes para muitas profissões e disciplinas acadêmicas. Análises de citações recebidas por textos epidemiológicos podem complementar outras visões em epidemiologia. O objetivo do estudo foi avaliar o número de citações recebidas por alguns livros de epidemiologia e saúde pública, como um primeiro passo para estudar a influência do pensamento epidemiológico e o pensar da academia. Para este propósito, a base de dados do Institute for Scientific Information/Thomson Scientific - Web of Science/ Web of Knowledge foi consultada em maio de 2006. O livro de Rothman & Greenland recebeu o maior número de citações no total (mais de 8,000) e por ano. Os livros de Kleinbaum et al, e de Breslow & Day tiveram em torno de 5,000 citações. Em termos de citações por ano, o livro de Sackett et al ocupou o terceiro lugar, e o de Rose, o quarto entre os incluídos no estudo. Outros livros que tiveram influência em salas de aula, comparativamente, tiveram menos citações. Os achados oferecem um rico retrato das influências acadêmicas e tendências de métodos epidemiológicos e
INTRODUCTION

Books, and among them textbooks, are of a too obvious importance to any profession and academic discipline. ‘Obvious’ to the extent that systematic, comprehensive and contemporary analyses of their contents are often lacking. This seems largely the case of books in epidemiology and public health – itself a uniquely polyedric set of disciplines and professions, with a rich tradition of self-reflection into epistemological, ontological and other philosophical issues.1,2,12,49,67

It is owed to professor Raj Bhopal, currently at the University of Edinburgh Medical School, the only comprehensive and critical analysis of contemporary epidemiology textbooks.10,11 Of course, book reviews do provide the occasion or the excuse for the informal side comment on the state of the discipline.29

Potentially related, but often at unconnected level, simple quantitative compilations of bibliometric data have quite been considered as lacking meaning precisely or mainly because of their theoretical vacuum, or their ignorance of the institutional and intellectual contexts in which the discipline is practised.2

During a sketchy reflection on the oeuvre of Susser,57 one of the most influential epidemiologists of the 20th century, a first approach was undertaken at the number of times his main text in epidemiology. Causal thinking in the health sciences66 had been cited, as recorded in the Institute for Scientific Information – ISI/Thomson Scientific database.55,56,58,59 It hence became more apparent that citation analyses of epidemiologic texts might help complement other analyses and reflections on epidemiology. Thus, the objective of this essay was to assess the number of citations received by selected epidemiologic/public health books, as a first step towards studying the influence of epidemiological thought and thinking within academic communities.

METHODS

In late May, 2006 we accessed online the ISI/Thomson Scientific - Web of Science/Web of Knowledge.4 This includes: a) the well-known Science Citation Index Expanded (SCI-Expanded), from 1945 to present;55,56 b) the Social Sciences Citation Index (SSCI), from 1956 to present; and c) the Arts & Humanities Citation Index (A&HCI), from 1975 to the present.

Based on Bhopal’s list10,11 and own teaching references, it was first searched for the number of times several important books in epidemiology had been cited. Since this is an exploratory exercise, we limited the analysis to about a dozen books that in the authors’ view, offer the possibility to contrast several approaches, subspecialties and schools of thought. Specifically, the following books were first included (in chronological order of the first edition):

- Morris’ Uses of epidemiology50-52 (1957, 1964, 1975);
- MacMahon et al Principles and methods42,43 (1960, 1996);
- Susser’s Causal thinking in the health sciences66 (1973);
- Barker & Rose Epidemiology in medical practice3-7 (1976, 1979, 1990, 1998);
- Fletcher’s Clinical epidemiology22-25 (1982, 1988, 1996, 2005);
- Kleinbaum et al Principles and quantitative methods34 (1982);
- Miettinen’s Theoretical epidemiology48 (1985);
- Feinstein’s Architecture of clinical research19 (1985);
- Rothman & Greenland’s Modern epidemiology61,62 (1986, 1998);
- Sackett et al. Clinical epidemiology63,64 (1985, 1991);
- Hennekens et al Epidemiology in medicine39 (1987);
- Rose’s Strategy of preventive medicine60 (1992);

On a second stage, other books were included, generally more specialised and which allowed to explore the relationship between citations and other characteristics of epidemiology books.

For each book many possible citations were searched, to allow not only for citation mistakes (e.g., in the authors’ initials or surname, in the title of the book),
but also to capture all citations to individual chapters or sections of the book (e.g., citations to specific pages). The search was not restricted to any period and hence, books published long ago had more time to accumulate citations. As further specified ahead, all directly related editions for a given book were included (see footnotes to Table 1).

### RESULTS

Table 1 shows books included in this essay along with their main editions, the years elapsed from the first edition until 2006, the number of citations registered by ISI/Thomson, and the simple average of citations received per year.

Some books that appear to have been or to be widely influential in the classrooms and beyond may have collected relatively few citations. This first observation is perhaps partly subjective, but nonetheless sounds true. Particularly, but not only, books primarily intended for the undergraduate audiences, such as those by Barker & Rose, or Gordis. This is not a rare phenomenon and it is not exclusive of “teaching books”, but also of good review papers used as teaching materials (mentioned by teachers, reprinted in course materials, read by students). For example, Bhopal’s useful paper, has received just three citations (one by a paper in the field of academic medicine, and two by Bhopal himself – one in a review of the Oxford Textbook of Public Health and one in a related journal paper).

The identification and citation analysis of “key teaching papers” would be a fascinating topic of importance in itself, and also to further characterize how epidemiological thinking flows.

Rothman’s is the epidemiologic book that has received the highest number of citations (Table 1). The number shown in the table is certainly an underestimate, since a number of additional citations have been ‘given’ to chapters not authored by Rothman & Greenland. For multi-author textbooks the characteristics of the ISI/Thomson database require to search individually for citations to each chapter (possible only by name of first author of the chapter), and then add-up the citations received by all chapters. This applies to all books with chapters that were not written by the main authors or editors. This fact may be particularly relevant for some important books, such as Schottenfeld and Fraumeni’s huge text on cancer epidemiology and prevention.

### Table 1 - Total number of citations received by a selection of books of epidemiology, based on ISI/Thomson's Scientific - Web of Science/Web of Knowledge.

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<tr>
<th>Author(s)</th>
<th>Brief title &amp; refs.</th>
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<th>Citations</th>
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<td>Hennekens, Buring</td>
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<td>Rose</td>
<td>Strategy of preventive medicine</td>
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<td>14</td>
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<td>Gordis</td>
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*Any edition of the books shown in the table may have been reprinted several times, and citations to subsequent printings are included.
Years elapsed since first edition (citations are up to 27 May 2006).
For all books with more than one edition, the number of citations includes citations to any and all editions.
Other important books by Feinstein would need to be considered in future analyses.
The number of citations does not include citations recorded with the name of the individual author of chapters not authored by Rothman & Greenland. For multi-author textbooks the characteristics of the ISI/Thomson database require to search individually for citations to each chapter (possible only by name of first author of the chapter), and then add-up the citations received by all chapters. This applies to all books with chapters that were not written by the main authors or editors. This fact may be particularly relevant for some important books, such as Schottenfeld and Fraumeni’s huge text on cancer epidemiology and prevention.
number of citations. This leading positions are also apparent when the time since publication is taken into account; i.e., when considering the average number of citations per year (c/y). Although the ranking does not change substantially, it is noticeable that c/y make the book by Rose climb to the fourth place, after Rothman & Greenland’s (first), Kleinbaum and colleagues’ (second), and Sackett and colleagues’ (third). The data in Table 1 is not surprising (which speaks well of the data source); and quite a photograph of academic influences – and trends – in the past quarter century.

Other specialised books of epidemiology are listed in Table 2. The two books by Breslow & Day on cohort and case-control studies are highly cited; again a not surprising fact. Particularly in light of their well-known quality and innovative contents, and of their methodological focus, as previously observed with the books from Rothman & Greenland.

DISCUSSION

Clearly, all books are not ‘on the same ground’. For instance, Rothman’s, Kleinbaum’s and others have more on technique than, say, Susser’s, Roses’ or Morris’ and may hence be more quotable by (the vast majority of) empirical papers. Other books are primarily meant for students and may hence be less cited by professional researchers; this may be the case of the books by MacMahon et al, Gordis, or the Lilienfelds.

The caveats of ISI’s database are also relatively well-known, though not always kept in mind. Special attention must be paid to the source of citations: so-called ‘source’ journals chosen by ISI/Thomson; not always a comprehensive or obvious choice. Hence, the truly determinant source of the number of citations are, generally speaking, research-oriented, academic, largely Anglo-Saxon journals. This fact greatly influences – again, not so obviously – the chances that different types of books have of acquiring citations. Methodological, highly-technical books of direct use for research in the biomedical sciences are prime candidates to being cited.

The choice of texts included here is no doubt personal and purposely limited. In the future, it will need to be expanded to include more books on the social sciences and public health, biostatistics as applied to epidemiology and health research, as well as the subspecialties (e.g., social epidemiology, nutritional epidemiology, molecular and genetic epidemiology, disease- and exposure-oriented approaches). The authors definitely did not wish to limit the analysis to textbooks. Rather, it is needed to aim at capturing texts that express epidemiologic thought and thinking. There are several other obvious limitations of this exploratory essay that will not be discussed herein due to space factors.

A good number of epidemiologists have written more than one or two books. When this happened, it would clearly be a mistake to focus on just one text to judge the influence of the scholar. In the case of Susser, for instance, his Sociology in medicine has accumulated over 300 additional citations. Kleinbaum, Last, Friedman or Abramson are other examples of authors with several influential textbooks.

<table>
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<th>Author(s)</th>
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<th>Citations</th>
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<td>Morrison</td>
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*aAny edition of the books shown in the table may have been reprinted several times, and citations to subsequent printings are included.

*bYears elapsed since first edition (citations are up to 27 May 2006).

*cThe ISI/Thomson data actually do not allow to distinguish citations to each of the two books.
Citations to books are just a fraction – usually unknown – of citations received by epidemiologic writings of all sorts. Even books heavily or completely focused on methods, they are probably much less cited than methodological papers. Impressively, for instance, just one of Miettinen’s papers has accumulated over 1,500 citations in the ISI database. And at least a dozen of other papers – most methodological, usually authored by him alone – have accumulated over 100 citations each. Thus, a few papers by a leader like Miettinen may easily ‘have’ over 3,000 citations. Similarly, Feinstein had over 50 papers with more than 10 citations each, and several are very close to 1,000 citations each. The use of books and their ‘impact’ in research and professional practices are questions that often seem to escape analyses.

The future of books is an ever exciting issue.

An open question on citation analysis remains: what does it actually mean? In this sense, it is known that citation analyses (of journals, papers, books, persons, institutions…) are only part of a complex and value-oriented process – a process deeply embedded in socioeconomic and cultural realities.

So what do ISI/Thomson citations tell about epidemiology books and epidemiology at large, other than that some books are more ‘quotable’ or ‘citable’ than others? The floor is yours, the debate is worthwhile. While shades and problems would need to be addressed openly, one positive feature stands out: the enormous and positive influence of epidemiologic methods and reasoning – beyond epidemiology and public health – into clinical medicine. In addition, to a lesser but noticeable extent, the microbiologic sciences.

Books have been, are, and shall continue to be privileged witnesses – and main characters at once – of a number of fundamental scientific and professional processes concerning epidemiology and the other health, life and social sciences (Table 3). Amsterdamska reminds that epidemiologists’ ideas about what it means to be a science and how to ‘demarcate’ epidemiology changed several times during the 19th and 20th centuries. “These changes in the definitions of disciplinary identity of epidemiology went hand in hand with changes in the institutional location of epidemiology, its professional organization, and its practical engagement in public health policy and administration. Ideas about epidemiology’s boundaries also structured the field’s intellectual priorities shaping the questions that were asked, the methods used to address them, and the kinds of answers that were considered appropriate.”

Each and all of these processes may be found and has to be explored in epidemiology books, too.

ACKNOWLEDGEMENTS

Supported in part by grants from ‘Red temática de investigación cooperativa de centros en Cán cer’ (C03/10) and ‘Red temática de investigación cooperativa de centros en Epidemiología y salud pública’ (C03/09), Instituto de Salud Carlos III.

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