Robert Rosenthal. What has the Cochrane Archive of Systematic Reviews Added to the Medical Literature? A Master's paper for the M.S. in L.S. degree. April, 2013. 35 pages. Advisor: Jane Greenberg

The Cochrane Database of Systematic Reviews is a source of practical medical information. Systematic reviews summarize the best current research in a field to provide a timely peer reviewed professional summary. These reviews are available through Cochrane.org. This study examines the Cochrane Systematic Reviews by surveying its content to see if it expands the medical literature of effective health practice. How often are articles outside the publication characteristics of the JAMA, published in the Cochrane Database of Systematic Reviews? Previous work on JAMA article characteristics were reviewed, along with published restrictions including length and number of works cited. The Cochrane Systematic review articles were compared to see how many of them are at variance with JAMA. Particularly interesting are publication biases toward conclusive studies that have been documented to undermine previously published results. Combining inconclusive studies with length restrictions there is no overlap in the two collections.

Headings:

Cochrane Archive

Systematic Reviews

Publication Bias

Inconclusive articles

Journal of the American Medical Association (JAMA)
What has the Cochrane Archive of Systematic Reviews added to the medical literature?

by
Robert Rosenthal

A Master's paper submitted to the faculty of the School of Information and Library Science of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of Science in Library Science.

Chapel Hill, North Carolina
April, 2013

Approved by:

_______________________
Jane Greenberg
Table of contents

Page 1 Table of contents

Page 2 Research questions

Page 2 Background

Page 4 History

Page 6 Study and Method

Page 8 Analysis

Page 13 Conclusions

Page 16 Bibliography

Page 27 Appendix
Research Questions:

1. What are medical systematic reviews?
2. Why are inconclusive research articles important?
3. How do the articles in the Cochrane archive compare to those in Lancet and the Journal of the American Medical Association (the two leading medical Journals in the world)?

Background

It is commonly pointed out that most research is inconclusive; although inconclusive articles are rarely published in the academic literature. In discussions with several professors it emerged that this might be a problem in several fields due to biasing result and repeated wasted effort. This paper attempted to ascertain if conclusive and inconclusive articles seemed to correlate with particular extrinsic characteristics. If so, were there other important differences between the content of a location where those studies could be found and more traditional journal sources. This work did not attempt to second guess the authors’ own verdicts. The difficulty in this project began with locating a journal that publishes both conclusive and inconclusive research. There seems to be a huge bias in favor of conclusive results and frankly positive conclusions. The overall impact and documentation of this bias has been studied by others, but is not the
subject here; one large review of medical literature\(^1\) found that articles had positive conclusions in between 67% and 100% of published work depending on the influence of the journal with leading journals being more positive.

Controlling for these publishing biases is especially important in the field of medical research. Similar problems may exist in the peer reviewed literature in history or philosophy and may be an issue for academics, but inaccuracies in medical work can lead to deaths, injuries and wasted money. The field of systemic reviews is particularly ripe for this sort of research since much of medical practice is based on tradition and other arbitrary factors; and since a lot of approaches have no proven benefits or detriments. Further, there has been work suggesting that systematic reviews are in the process of becoming the guiding force\(^2\) in evidence based medicine, so it is also an important area in its own right.

**History**

---

\(^1\) Kanaan, Ziad MD, PhD*; Galandiuk, Susan MD*,†; Abby, Margaret BA‡; Shannon, Katherine V. BS*; Dajani, Daoud MBBS, MSc*; Hicks, Nathan BS*; Rai, Shesh N. PhD§ *The Value of Lesser-Impact-Factor Surgical Journals As a Source of Negative and Inconclusive Outcomes Reporting* Annals of Surgery:arch 2011 - Volume 253 - Issue 3 - p 619–623 doi: 10.1097/SLA.0b013e31820d9b04

\(^2\) Eliasson M. Lakartidningen. 2000 May 31;97(22):2726-8. Review. Swedish. [The systematic review is the foundation of evidence based medicine. One of the most important contributions to clinical medicine of the past decade]. PMID:10900892[PubMed - indexed for MEDLINE]
Medical journals are important vehicles to share information that affect people’s lives\(^3\). Since at least 1823\(^4\) when Lancet a British journal was first released, these publications have served as peer reviewed vehicles to inform doctors and others of research in the field and change the treatments that patients receive\(^5\)\(^6\). The purpose of this paper was to examine what the Cochrane Database of Systematic Reviews, a source for articles available online, adds to the traditional medical journals. In particular, the Cochrane Database of systematic medical reviews will be examined to see if it is adding something to the field or just providing another venue for largely the same articles.

The Cochrane Library was chosen because an article advocating increased publishing of inconclusive studies mentioned it\(^7\), in fact it specifically highlighted the area of systematic studies, so this paper will focus there. Even in a collection that


\(^7\) Alderson, P., Roberts, I. Should journals publish systematic reviews that find no evidence to guide practice? Examples from injury research BMJ. 2000 February 5; 320(7231): 376–377. PMCID: PMC1127151
includes a non-trivial amount of inconclusive studies, there is still a preponderance of conclusive ones.

In 1972 Archie Cochrane published a book commenting on medical effectiveness. Thus began a public career which led to a more systematic look at medicine. As Dr. Cochrane wrote in 1979\(^8\)

"It is surely a great criticism of our profession that we have not organised a critical summary, by specialty or subspecialty, adapted periodically, of all relevant randomised controlled trials."

He also designated obstetrics the least scientific medical specialty.

This furthered his commitment to finding a better way and attracted others to his cause. Along the way he published more articles and other work, including a bibliography of studies and attempts to identify unpublished research. These efforts eventually bore fruit in the form of the first Cochrane center focused on pregnancy and child birth in 1992. Over time more subject areas were added and other focuses emerged but the path to the Cochrane Database was like a stone starting an avalanche and by 2001 Lancet agreed to publish Systematic reviews already in the Cochrane database. This may be the clearest indication of both the importance of systematic reviews and the respect for the quality of the Cochrane archive, since Lancet could have opted to try and establish its own standards in the area but chose instead to rely on Cochrane. Another milestone started in 2002 when Ireland became the first nation

---

to provide free access for anyone in that country. *That has now spread to the whole world.*

As defined on the Cochrane website:

“A systematic review attempts to identify, appraise and synthesize all the empirical evidence that meets pre-specified eligibility criteria to answer a given research question. Researchers conducting systematic reviews use explicit methods aimed at minimizing bias, in order to produce more reliable findings that can be used to inform decision making. The articles in the Cochrane Library are peer reviewed and held to high standards of scientific rigor.”

These reviews have become increasingly valuable with the increased specialization of medicine and the pace of new research accelerating making it increasingly difficult for practitioners to stay abreast of the field.

**Study and Methodology**

Limiting the articles to this one journal, and focusing the comparisons with one other specific journal (JAMA) reduces the variability of subject matter, i.e. physics conclusive, economics inconclusive etcetera. This research compared approximately twenty articles of each type from the Cochrane library (through UNC Library E-journals, [http://www.thecochranelibrary.com.libproxy.lib.unc.edu/view/0/index.html](http://www.thecochranelibrary.com.libproxy.lib.unc.edu/view/0/index.html)). A number of characteristics were chosen *a priori* to analyze: number of authors, duration of study, length of article, funding source, background of authors, etcetera. These characteristics were selected based on general accepted practice of reporting research
and key properties noted for indexing and organization of findings. Several initial thoughts about each were noted, to elucidate the initial bias of this paper, and the results of the analysis are highlighted as well for each characteristic in the appendix. For example, do more people want to be associated with conclusive work? In this work, I represented the results that proved most relevant to the research in the body of this paper and additional results are found in the appendix. There was, of course, a high possibility that this study would itself be inconclusive.

To choose articles for this study, the methodology for selection was to look at every inconclusive article that appeared in a search of the Cochrane Archive. Then I used the next conclusive article to garner a similar number and subject of those articles for comparison. In order to avoid harking some possible interpretations of the results were listed in advance of looking at the data. HARKing (Hypothesizing After the Results are Known). HARKing is defined as presenting a post hoc hypothesis (i.e., one based on or informed by one's results) in one's research report as if it were, in fact, an a priori hypotheses.

It turned out that the effective practice/health systems area had nineteen inconclusive articles out of eighty-two at that time


---

The study sampled included comparison nineteen articles of each type.

While a comparison of thirty-eight articles is not nearly enough to draw a definitive conclusion it does point the way to further research about the nature of peer reviewed articles. The characteristics gleaned from this work were used as a basis for comparison with the historical gold standard in medical studies journals JAMA.

The length in pages of the articles however was analyzed and echoed the number of instances.

Table 1. Page length comparison of conclusive and inconclusive Cochrane Systematic Reviews.

<table>
<thead>
<tr>
<th></th>
<th>inconclusive</th>
<th>conclusive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>median # pages</strong></td>
<td>21</td>
<td>70</td>
</tr>
<tr>
<td><strong>mean # pages</strong></td>
<td>26.47368421</td>
<td>69.73684211</td>
</tr>
</tbody>
</table>

Conclusive articles were significantly longer in the Cochrane, even though there was no pressure to fit the number of pages to some limit in the Library. Obviously this paper cannot say whether people write longer works if they find something conclusive or if people who are writing longer papers work harder to conclude something.

Analysis
How often are articles outside the usual publication characteristics of JAMA, published in the Cochrane Systemic Reviews?

To answer this question the characteristics of systematic reviews in JAMA would be compared to the characteristics of those in the Cochrane Database of Systematic Reviews. Previous research studying JAMA such as the prevalence of positive findings in articles would be combined with requirements such as article length to see if the Cochrane is in fact publishing articles that differ from those of JAMA and therefore is expanding the information available in peer reviewed journals.

The data was analyzed quantitatively. The article characteristics established by previous scholarship, combined with the publication guideline will be used for the systematic reviews in the Journal of the American Medical Association. Using those sources as a guide the articles in the Cochrane Archive of Systematic Reviews will be classified to see how often they deviate from those characteristics, particularly in length, positive result and conclusiveness. The rationale for this approach is to see what percentage of the Cochrane articles are outside JAMAs pattern, thus demonstrating the amount of “new or different publication” characterized by the archive.

This method has the advantage of being quantifiable and readily replicated and verified by independent researchers. The method has the further advantage of relying on formal categories and the article authors’ own conclusion of their work. It may be true that an expert might be able to reach different conclusions than the authors themselves as to how or whether the research is conclusive or not and how long the research article
should be to best capture the work. Absent contrary research which I was unable to locate, I believe that the articles published without a bias towards positive conclusions and arbitrary word limits are more accurate and helpful for those looking to understand the research topics and much more free of harking.

Looking at the articles is a form of content analysis; the approach was as systematic as I could make it. The authors of the Systematic reviews and editorial staffs of the journals are not being second guessed, both because I feel that I lack the scientific and medical knowledge to analyze the work and because relying on the articles as presented makes the analysis more objective and repeatable by other researchers. Since the Journal of the American Medical Association uses a hard word limit for length it is straightforward to simply check to see if the articles in the Cochrane Database of Systematic Reviews are longer than that. Conclusions such as those presented in the Author’s Conclusion section of the article abstract will not be second guessed, if the author says no conclusion can be drawn or the results indicate that this therapy improves results for diabetic middle age men, then those results will be considered inconclusive and positive respectively.

What does Cochrane add? Is it just an online spot for lower quality research?

How different are the Cochrane Database of Systematic reviews from the systematic reviews published in JAMA and are they being cited? Some of the

characteristics highlighted by earlier research include space restrictions and various kinds of publication bias. In particular a bias towards publishing positive conclusions within articles of established journals has been documented. Some changes in traditional journals have already occurred as they have moved into the digital and online formats such as speed of distribution and online search ability. Others have improved the quality and usefulness of articles to practitioners blurring some of the distinctions between the traditional print journals and the more recent born electronic publications.


A number of articles have documented a bias in traditional journals against inconclusive\textsuperscript{16} and negative research perhaps presenting an inaccurate picture of the current research. This problem has been documented in antidepressant\textsuperscript{17}, cognitive behavioral therapy\textsuperscript{18}, and animal stroke\textsuperscript{19} studies among several areas. Also, by limiting the length articles, it may mean that some pertinent details are left out. Lancet limits submissions to 3000 words and 30 references\textsuperscript{20} while the Journal of the American Medical association (JAMA) is broader for systematic reviews according to the author instructions on its website\textsuperscript{21}:

\begin{flushright}
\end{flushright}

\begin{flushright}
\end{flushright}

\begin{flushright}
\end{flushright}

\begin{flushright}
\end{flushright}

\begin{flushright}
\textsuperscript{20} "Types of Article and Manuscript Requirements.", accessed 10/1, 2012, \url{http://www.thelancet.com/lancet-information-for-authors/article-types-manuscript-requirements}.
\end{flushright}

\begin{flushright}
\textsuperscript{21} Editor. and Editorial Staff. "\textit{JAMA Instructions for Authors.}", accessed 10/1, 2012, \url{http://jama.jamanetwork.com/public/instructionsForAuthors.aspx}.
\end{flushright}
The Cochrane Database for Systematic Reviews has no such limits. It was first made available to the public in 1994 as part of a progression of works to help study the effects of healthcare. It is a peer reviewed collection with high scientific standards, Today, John and Wiley and Sons publishes articles in 53 different subcategories each with a coordinating editor. The Cochrane Database claims to be the premier source for systematic reviews (the preceding paragraph is based on information on their website\textsuperscript{22}). An obvious concern could be raised at this point that Lancet’s restrictions combined with the use of the Cochrane archive as screening method would seem contradictory, but it may be that the articles that appear in Lancet are akin to a Reader’s Digest version of the Cochrane original. This is an area for future research by an investigator who is either well versed in medical research or perhaps has access to sophisticated comparison software. It also might be explored through interviews with researchers who have attempted (successfully and not) in both venues.

**Conclusions**

In looking at the articles that were analyzed from the Cochrane library it should be clear that inconclusive articles are not part of the literature that would be published

\textsuperscript{22} “about the Cochrane Library\textsuperscript{,}”, accessed 11/6, 2012, http://www.thecochranelibrary.com/view/0/AboutTheCochraneLibrary.html
in JAMA. More surprisingly the shortest conclusive article was eighteen pages long. That article was over 9,000 words. Therefore with a limit of 3500 words the maximum length of a JAMA article is fourteen pages. The limit on the number of the references was not compared because of the inconsistencies in how those were expressed. Further research might determine how many systematic reviews in Cochrane have more than the 50-75 maximum in JAMA. Even without that being explored it is clear that none of the articles sampled in Cochrane would be in JAMA. The issue is not inherent quality issues therefore the universe of quality peer reviewed medical literature has been expanded. Further research on how the Cochrane Archive of Systematic reviews has expanded or enhanced the medical literature can be pursued by interviewing doctors and other users to see how they actually employ the information in the field. An examination of other journals that emerged in the internet era may indicate if the Cochrane is a trendsetter or an emerging niche model of scholarly publication. Further research should be done to strengthen the findings of this paper before they are relied for larger. Another researcher should repeat my study with more recent articles in the Cochrane Archive to see if the characteristics are consistent over a wider sample. Also JAMA is aware of the pattern of publication bias, they attribute a great deal of it to selection bias by submitting authors. And being aware of a bias is the first step to

---

addressing it; which would greatly change the comparison. As noted above, this study was limited to a particular journal. It is possible that study with a larger sample may present different results. Even so, the work presented here indicates that adding the Cochrane Archive of Systematic reviews as a source for articles provides a more complete view of the medical research field and may provide a more accurate appraisal of the science by addressing the bias towards inconclusive article and avoiding arbitrary length limits. More research is needed on this topic with a larger sample, and extending to other disciplines. To see if this is a unique contribution by the Cochrane Archive or a more general improvement by digital publications.

---

Bibliography:

"about Cochrane Systematic Reviews and Protocols.", accessed 11/6, 2012,

"about the Cochrane Library.", accessed 11/6, 2012,
http://www.thecochranelibrary.com/view/0/AboutTheCochraneLibrary.html.

retrieved 9/28/2012.

"Types of Article and Manuscript Requirements.", accessed 10/1, 2012,
http://www.thelancet.com/lancet-information-for-authors/article-types-manuscript-requirements.


Alderson, P., Roberts, I. *Should journals publish systematic reviews that find no evidence to guide practice? Examples from injury research* BMJ. 2000 February 5; 320(7231): 376–377. PMCID: PMC1127151


Evidence of Study Publication Bias and Outcome Reporting Bias. "PLOS Clinical Trials 3 (8).


Gallaham, Michael, Robert L. Wears, and Ellen Weber. 2002. "**Journal Prestige, Publication Bias, and Other Characteristics Associated with Citation of Published Studies in Peer-Reviewed Journals.**" *Journal of the American Medical Association* 287 (21): 2847-2850.


Grobler L, Marais BJ, Mabunda SA, Marindi PN, Reuter H, Volmink J. **Interventions for increasing the proportion of health professionals practising in rural and other underserved areas.** *Cochrane Database of Systematic Reviews* 2009, Issue 1. Art. No.: CD005314. DOI: 10.1002/14651858.CD005314.pub2.


Irving CB, Saylan M. **Mother and baby units for schizophrenia.** *Cochrane Database of Systematic Reviews* 2007, Issue 1. Art. No.: CD006333. DOI: 10.1002/14651858.CD006333.


Kanaan, Ziad MD, PhD*; Galandiuk, Susan MD*,†; Abby, Margaret BA‡; Shannon, Katherine V. BS*; Dajani, Daoud MBBS, MSc*; Hicks, Nathan BS*; Rai, Shesh N. PhD$. **The Value of Lesser-Impact-Factor Surgical Journals As a Source of Negative and**

Légaré F, Ratté S, Stacey D, Kryworuchko J, Gravel K, Graham ID, Turcotte S.

**Interventions for improving the adoption of shared decision making by healthcare professionals.** *Cochrane Database of Systematic Reviews* 2010, Issue 5. Art. No.: CD006732. DOI: 10.1002/14651858.CD006732.pub2.


Shojania KG, Jennings A, Mayhew A, Ramsay CR, Eccles MP, Grimshaw J. The effects of on-screen, point of care computer reminders on processes and outcomes of


Tanja-Dijkstra K, Pieterse ME. **The psychological effects of the physical healthcare environment on healthcare personnel.** *Cochrane Database of Systematic Reviews* 2011, Issue 1. Art. No.: CD006210. DOI: 10.1002/14651858.CD006210.pub3.


Appendix

Other Findings about conclusive and Inconclusive articles in the Cochrane Collection

In an attempt to keep the topics as closely aligned as possible and inform the reader of the topics the subcategories of the articles are listed as well. The Cochrane Library provides three headings, though interestingly two of the articles are not listed under any of them.

<table>
<thead>
<tr>
<th>Cochrane subcategory within Effective Practice/Health Systems</th>
<th>inconclusive</th>
<th>conclusive</th>
</tr>
</thead>
<tbody>
<tr>
<td>broad overviews</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>reviews of interventions to improve specific types of practice</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>reviews of specific types of interventions</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>not in a subcategory</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Two of the categories considered deal with the authors. First the number of authors considered. If there is a clear pattern it might indicate that more authors want to be associated with a conclusive study or perhaps inconclusive study: the thought is too many chefs spoil the broth but everyone is to blame. Another consideration is the vocation of the author: are they doctors in the field, faculty members, government officials, corporate employees; are they even doctors at all. A corporate worker may choose not to share. Another possibility is that a hospital would just want to report any study they do, since they would be less concerned with academic reputation. It is unclear a priori if the push to publish anything would be stronger than the urge to produce conclusive research.

<table>
<thead>
<tr>
<th># Writer</th>
<th>inconclusive</th>
<th>conclusive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background</td>
<td>5.105263158</td>
<td>6.157894737</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th># Writer</th>
<th>inconclusive</th>
<th>conclusive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
It turns out that there is a slightly (one author) higher average number of authors for conclusive studies. In a surprise articles published with a corporate author and ones with non-doctors are twice as likely to be inconclusive. Which is counterintuitive to this author and suggests there was an overlooked factor, if it holds up with more research. Possibly the company is trying to prime the pump in a area for a new product or just burnish their reputation as an honest participant in the field.

A look at the funding behind a study if that information is shared might be illuminating. Again there is a suspicion that corporations are very selective with what research they fund or publish. On the other hand there is a growing trend for government sponsored research to be shared somewhere, since the public paid for it.

The only pattern that is clear here is that most research is co-financed by government agencies and academic institutions.

Another possibility is that some countries are more open to inconclusive research being published; therefore the country that an author’s institution is in gets its own category. And similar to the number-of-authors category the number of countries is noted to see if there a pattern there. In addition to those noted for authors there might be an independent relationship for international (or is that multinational) research.

<table>
<thead>
<tr>
<th>variation by Nation</th>
<th>inconclusive</th>
<th>conclusive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Austria</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Bahrain</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Belgium</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Canada 6 7  
Germany 1 2  
Italy 2 0  
Jamaica 1 0  
Netherlands 1 2  
Norway 1 3  
South Africa 1 7  
Sweden 0 1  
Switzerland 0 1  
Turkey 1 0  
UK 14 8  
USA 2 5  

<table>
<thead>
<tr>
<th>Actual Variation</th>
<th>inconclusive</th>
<th>conclusive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Australia, Austria, Germany</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Netherlands</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Australia, Belgium, Canada, UK</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Australia, South Africa</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Bahrain, Canada, Netherlands, UK</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Canada</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Canada, Italy, UK</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Canada, Norway, UK, USA</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Canada, UK</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Canada, USA</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Denmark, Germany, Norway, Sweden, UK</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Germany</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Ireland, South Africa, UK</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Italy, USA</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Jamaica, UK</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Netherlands, UK</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Norway, UK, USA</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>South Africa</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Switzerland, UK, USA</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Turkey, UK</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>UK</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>USA</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

The strongest relationship is that articles with at least one author from South Africa or Australia are far more likely to be conclusive than not: seven and four to one respectively. In fact when an article is by all South African authors it is apparently likely to be conclusive. The fourteen to eight ratio for UK authors is not as strong as it might appear since this is a United Kingdom publication and they are a part of the
majority of the articles therein. It should be noted the United Kingdom (UK) and
United States of America (USA) are represented by initials because that is how they
are listed in the Cochrane Library, while other nations are unabbreviated.

<table>
<thead>
<tr>
<th>Countries</th>
<th>inconclusive</th>
<th>conclusive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>multi-country</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Mean #</td>
<td>1.736842105</td>
<td>2.263157895</td>
</tr>
</tbody>
</table>

There was not a significant pattern to single or multinational publications, except for
South Africa as noted above. The higher number of countries for conclusive studies is
likely related to the higher number of authors. The ratio of authors to number of
countries is 0.34 for inconclusive article and 0.37 (rounding up) for conclusive and
really the sample is too small for even that level of precision to be meaningful, though
in a larger sample it might be interesting to see if those ratios held up, as an
observation about international medical scholarship.

Three characteristics of the studies themselves were considered as well. The
duration of the study is looked at, possibly long studies are more likely to be
conclusive since they are more deliberate or maybe quick studies lead to conclusive
work. Another possibility is that the type of study makes it more likely to have
conclusive results or not. Maybe clinical work is more likely to be inconclusive since it
is working in the real world or maybe literature reviews are more conclusive since
they are likely to be made up of conclusive studies (recall that most articles are
conclusive\(^{25}\)). Another possibility is the number of instances in a study is dispositive;

\(^{25}\) Barbui C, Cipriani A. Publication bias in systematic reviews. Arch Gen
maybe a small number makes it easier to be conclusive. Unfortunately the choice of health systems in the Cochrane Library negated most of these as variables in this investigation; all articles in this are studies of studies, either pure literature reviews or meta-data analysis so other types of research were unavailable for comparison. Also these sort of works lack the duration of an actual experiment. They were however enlightening in a comparison of how many instances or literature went into each category of article.

<table>
<thead>
<tr>
<th>Literature listed by size</th>
<th>inconclusive</th>
<th>conclusive</th>
</tr>
</thead>
<tbody>
<tr>
<td>articles</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>studies</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>studies</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>studies</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>studies</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Literature</th>
<th>mean literature</th>
<th>median literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>literature</td>
<td>5.789473684</td>
<td>2.0</td>
</tr>
<tr>
<td>articles</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>studies</td>
<td>13</td>
<td>18</td>
</tr>
</tbody>
</table>

As the table makes clear inconclusive articles tend to have far fewer studies or articles to analyze and also tend to be reviewing other folk’s articles rather than looking into their studies.

The length of the published article and the number of sources cited were also considered, maybe someone who writes a long article or cites a lot of sources is more likely to find a conclusion to validate all their work. The number proved unusable for this paper since the articles were inconsistent in their treatment of sources; some listed articles not used and some said they looked at x, but did not formally cite it, so that variable was not compiled for consideration.