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# Evidence Synthesis: Coming Soon to a Library near You?

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Maribeth Slebodnik, Ellysa Stern Cahoy, and Anna Liss Jacobsen

**abstract:** This article provides background information about evidence synthesis, the process of collecting, evaluating, and summarizing results from multiple studies that have investigated the same research question. The article also examines the critical role of librarians in conducting evidence synthesis, and examines the accelerating uptake of systematic reviews and other types of evidence synthesis outside the health sciences. It includes perspectives from two academic libraries and discusses implications of the boom in evidence synthesis that libraries may want to consider.

## Background

If you do not work in a health sciences library, the term *evidence synthesis* may not resonate with you. Perhaps that will change as the products of evidence synthesis, such as systematic reviews, are published with increasing frequency in disciplines outside medicine and its related fields. One definition of *evidence synthesis* states that it “involves the combination of information from multiple studies that have addressed the same research question, to extract a summary understanding of what is known at a specific point in time about the specific question.”<sup>1</sup> The scholarly publications that result from evidence synthesis projects include systematic reviews, meta-analyses, and integrative, scoping, and umbrella reviews. All these reviews aim to sum up the best available research on a question. A systematic review follows specific methodological standards and guidance, such as collecting evidence that meets predetermined criteria to reduce the risk of bias. Meta-analysis combines homogeneous data from multiple studies to develop a conclusion that is statistically stronger. An integrative review may

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include diverse methodologies, such as experimental and nonexperimental research. A scoping review compiles evidence to determine what is known, what remains unknown, and what requires further research, while an umbrella review synthesizes evidence from systematic reviews to provide a very high-level overview. Throughout this article, the term *systematic review* will be used to indicate any type of evidence synthesis product.

Evidence synthesis was proposed in the late 1970s to accelerate the application of research into practice, the pace of which could be agonizingly slow. Cochrane (<https://www.cochrane.org/>) and the Campbell Collaboration (<https://www.campbellcollaboration.org/>) are two worldwide organizations founded in the mid-1990s whose work focuses on the systematic review process. They brought global focus and energy to evidence synthesis and fueled a boom in the production of systematic reviews in the health sciences and social sciences. Systematic reviews of randomized, controlled trials aim to collect the available evidence on a topic and so to disseminate the research that underpins evidence-based health care. Widely produced in the social sciences, systematic reviews are also used to inform public policy. Crucially, the methodology of evidence synthesis advocates appraising the quality of the included research so that confidence in the results can be recommended—or not.<sup>2</sup> Thus, systematic reviews offer powerful and potentially influential evidence. Since systematic reviews have the power to guide, among other things, how a physician treats patients and how social programs are developed and maintained, the stakes are high, as is the need for unimpeachable quality. Global organizations such as Cochrane, the Campbell Collaboration, and JBI, formerly Joanna Briggs Institute, publish standards and guidelines to inform the production of high-quality evidence synthesis products.<sup>3</sup> Those guidelines have been revised and augmented over time to iteratively improve the process.

### Increasing Numbers of Systematic Reviews

The number of systematic reviews published annually continues to rise, and reviews in disciplines outside the health sciences contribute to that increase. A study published

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in 2010 estimated that 11 systematic reviews were published worldwide per day,<sup>4</sup> while a 2021 investigation reported that the number of reviews published each day had increased as of 2019 to approximately 80.<sup>5</sup> One of the authors of this article searched in Scopus for systematic reviews and retrieved over 40,000 citations for 2021. After health science subjects were filtered out, almost 5,000 (12.5 percent) reviews remained. While the search was not rigorous, the results are still informative. From the early history of evidence synthesis, when health care was a primary focus, the methodology has steadily spread to many disciplines in the social sciences, physical sciences, and life sciences. For example, at Penn State University,

systematic reviews have broadened in the last decade from the health sciences to a range of other disciplines, including education, agricultural sciences, and psychology.



The enthusiastic uptake of evidence synthesis has been marred by the reality that many systematic reviews are not executed according to accepted standards and guidelines, and therefore their conclusions may be questionable.<sup>6</sup> Properly conducting an evidence synthesis project is both time- and labor-intensive, and so the allure of streamlining the process is real. While many journals refuse to publish a systematic review without proper documentation of the process, others will do so. The temptation to submit an inferior report may be exacerbated by the intense pressure in many disciplines for faculty to publish. In addition to questionable quality, many systematic reviews are duplicative and therefore wasteful. The launch in 2011 of the PROSPERO database (International Prospective Register of Systematic Reviews), where teams could record their protocols for prospective

systematic reviews, has helped decrease but not eliminate this problem.<sup>7</sup> Registering a systematic review protocol requires the project team to rigorously define their project and evidence synthesis process before launching upon it. The registry helps other researchers avoid duplicating their topic, and so decreases research waste. While protocol registration can also be an indicator of review quality, the low rates of registration are problematic. In one study, only 21 percent of a sample of systematic review teams had prospectively registered their protocol.<sup>8</sup>

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### **The Critical Role of Librarians**

The involvement of a librarian trained in evidence synthesis methodology correlates with a higher-quality systematic review,<sup>9</sup> but the time and labor involved are significant barriers to librarian participation. Estimates of the time required for a librarian to undertake an evidence synthesis project range from 2 hours to over 200 hours. One study reported a median time investment of 18.5 hours for the entire project, and another documented a median time of 471 minutes for searching alone.<sup>10</sup> Some libraries lack adequate librarian staffing to provide systematic review support, but others have organized to meet the demand by developing systematic review services. Some have adopted a two-tiered, collaboration or consultation model. In this model, collaboration with a librarian includes publication credit and a large workload, while consultation is typically limited to assistance constructing a comprehensive search strategy and is rewarded with a mention in the article's acknowledgments.<sup>11</sup> Some libraries allocate the cost of selected systematic review services to the individuals or departments that request them.<sup>12</sup> Other institutions focus on educating students and faculty to perform an effective search and produce a publishable systematic review without librarian help.<sup>13</sup>

### **Systematic Review Services at Penn State: An Institutional Perspective**

Penn State University is an R1 institution, a doctoral university which has 24 individual campuses (including the online World Campus). A unique aspect of this institution is that



all campus libraries report through one dean, and services and resources are developed collaboratively across the system. As Amy Knehans, Esther Dell, and Cynthia Robinson report, the first Penn State campus to develop a systematic review service was the George T. Harrell Health Sciences Library at the Penn State College of Medicine in 2013.<sup>14</sup> This fee-based service provides a structure (including a model for cost recovery) for libraries to offer specialized systematic review support. Outside the College of Medicine, requests for systematic review assistance have surged over the past five or so years at Penn State's University Park campus, primarily in the life sciences (including agricultural sciences, human development and family studies, and nursing), education, and psychology. In response to increased demand from faculty members and graduate students outside the College of Medicine, the Penn State University Libraries formed a Systematic Review Task Force in 2021 to investigate the scope of evidence synthesis requests across campuses and to recommend a model for training, responsibility, and provision of services. The Task Force's initial report (as of January 2022) showed limited requests for evidence synthesis assistance outside the life sciences, education, and psychology. The investigation

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found, however, growing interest among libraries faculty in a wide range of disciplines, including engineering, business, and health and human development, in learning to support these methodologies with their users. Feedback from libraries faculty indicated a preference for developing an expert team or a specific group of librarians charged with “owning” and providing services related to evidence synthesis and systematic reviews. Other strategies for supporting faculty and student work in this area included collaborative training initiatives, such as establishing a community of practice.

This would enable a broader approach to building capacity and investment throughout the libraries. The Penn State University Libraries will use the feedback to determine a path forward to support these requests and to provide resources and training to those outside the College of Medicine interested in systematic review and evidence synthesis.

### **Systematic Review Services at Miami University: A Librarian's Perspective**

Anna Liss Jacobsen began working as an academic librarian at Miami University Libraries in Oxford, Ohio, in 2017. Miami University is an RU/H institution, a research university with high research activity, and has a combined enrollment of over 20,000 students. In her role as subject librarian to social sciences departments (overlapping with sciences and health sciences areas), Jacobsen soon began fielding requests for systematic review consultations. In her words:

Initially my consultations were not useful because I did not know what a systematic review was! I learned about systematic review and evidence synthesis (SR/ES) in the medical/health sciences field, taking classes from University of Michigan Taubman



Libraries and elsewhere, and adapting the requisite knowledge and skills to the disciplines that I served. I set myself a goal to develop a comprehensive SR/ES service at Miami to address what seemed to be an unmet need.

The first step was to compile a comprehensive LibGuide describing the steps of the review process, types of reviews, tools, and resources. I taught libraries colleagues about SR/ES at informal meetings, and a few went on to take additional formal training. To build awareness, I marketed the service across departments and during student and faculty orientations. Usage grew significantly, often fueled by word of mouth. I provided instructional SR/ES consultations for undergraduate and graduate research projects, reviewed manuscripts, and advised SR teams how to meet guidelines and standards for their SR/ES projects. I also coauthored presentations, publications, and grants with faculty, senior graduate students, and affiliated researchers. My expertise led an interdisciplinary research center at Miami focused on educational outcomes to invite me to become a faculty associate.

As the demand for systematic review consultations increased, Jacobsen focused on training:

As service usage grew, sustaining the SR/ES service became more difficult. My instructional practice has always focused on empowering learners, and this equipped students and faculty to conduct their own SR/ES projects and helped optimize my own efforts. This saved stakeholders time, improved the overall quality of SR/ES production, and greatly advanced their understanding of SR/ES research. Faculty were able to publish high impact, highly cited publications, contributing to successful faculty promotion and tenure cases. These outcomes reflected well on the libraries and led to further engagement opportunities.

Library leaders and teaching faculty soon became convinced of the value of the library's systematic review and evidence synthesis offerings:

Miami University Libraries' leadership focus on demonstrating that the libraries are fully engaged with the greater institution's mission and contribute to its success. The value of new service offerings is assessed based on costs versus outcomes analysis. Initially the value of the SR/ES service was questioned by leadership because of the amount of time and labor required. When the assistant dean of libraries heard the positive responses from faculty, who described the added value of ES/SR work and willingly shared coauthorship with me, the wealth of positive outcomes became clear. Faculty were particularly vocal about the value of my contribution to grant applications—the presence of a librarian on an ES research team is cited as a clear asset and improves the chances of obtaining grant funding for SR/ES work. The benefits afforded by SR/ES work enhanced the libraries' value to their campus constituents and became part of the service portfolio.

### **Implications for Academic Libraries**

While many health sciences libraries have instituted or proposed systematic review services to support evidence synthesis at their institutions,<sup>15</sup> that trend is less prevalent outside the health sciences. At least two universities, Cornell University in Ithaca, New York, and the University of Minnesota, have established such services specifically for



librarians and faculty outside health disciplines.<sup>16</sup> The demand for systematic review support has outstripped the supply of librarians with the necessary skills and experience.<sup>17</sup> Evidence synthesis training has been available for health sciences librarians,

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but for librarians in other disciplines, there is currently only one training program, which is funded by the Institute of Museum and Library Services and jointly offered by Cornell University, Carnegie Mellon University in Pittsburgh and the University of Minnesota.<sup>18</sup>

In response to the labor required of all participants in evidence synthesis projects, several automation tools, some free and others with a steep price tag, have been developed to help streamline the process.<sup>19</sup> For the most part, they help decrease the evidence synthesis team's

workload but not specifically that of the librarian. The time and labor commitments notwithstanding, contributing to evidence synthesis projects gives librarians a rich opportunity to provide a highly visible, highly valued service in close collaboration with faculty and students, to improve the quality of locally published systematic reviews, and potentially to enhance their resume with a publication credit.

As systematic reviews gain traction outside the health sciences, the dearth of qualified librarians will become even greater. To add complexity, the standards and guidelines used in systematic reviews in the health sciences do not necessarily translate to subjects outside the field. Therefore, some disciplines, such as conservation, software engineering, and management, have developed their own guidelines for systematic reviews.<sup>20</sup> The methodology for all disciplines continues to evolve. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidance for assembling the multiple pieces of a systematic review, first published in 2009, was updated in 2021. PRISMA has added extensions for reporting scoping reviews, network meta-analyses, individual patient data, systematic review protocols, and other research types.<sup>21</sup>

The uptake of evidence synthesis into additional disciplines presents both opportunities and challenges for academic libraries. As evidence synthesis continues to spread to more fields, faculty will become increasingly likely to clamor for support for these important, labor-intensive, and rewarding projects. If librarians at your academic library have not yet been approached for help with evidence synthesis, they may very well get such requests in the future. Expert provision of evidence synthesis work requires ongoing effort for librarians to achieve and libraries to provide.

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## Notes

1. "The Value of Evidence Synthesis," *Nature Human Behaviour* 5, 5 (2021): 539, <https://doi.org/10.1038/s41562-021-01131-7>.
2. "The Value of Evidence Synthesis."
3. Edoardo Aromataris and Zachary Munn, eds., *JBIM Manual for Evidence Synthesis* (Adelaide, Australia: Joanna Briggs Institute, 2020); Campbell Collaboration, "Author Guidelines," *Campbell Systematic Reviews*, 2022, <https://onlinelibrary.wiley.com/page/journal/18911803/homepage/author-guidelines>; Julian Higgins, James Thomas, Jacqueline Chandler, Miranda Cumpston, Tianjing Li, Matthew Page, and Vivian Welch, eds., *Cochrane Handbook for Systematic Reviews of Interventions* (Chichester, UK: Wiley, 2019), <https://www.training.cochrane.org/handbook>.
4. Hilda Bastian, Paul Glasziou, and Iain Chalmers, "Seventy-Five Trials and Eleven Systematic Reviews a Day: How Will We Ever Keep Up?" *PLOS Medicine* 7, 9 (2010), <https://doi.org/10.1371/journal.pmed.1000326>.
5. Falk Hoffmann, Katharina Allers, Tanja Rombey, Jasmin Helbach, Amrei Hoffmann, Tim Mathes, and Dawid Pieper, "Nearly 80 Systematic Reviews Were Published Each Day: Observational Study on Trends in Epidemiology and Reporting over the Years 2000–2019," *Journal of Clinical Epidemiology* 138 (2021): 1–11, <https://doi.org/10.1016/j.jclinepi.2021.05.022>.
6. John P. A. Ioannidis, "The Mass Production of Redundant, Misleading, and Conflicted Systematic Reviews and Meta-Analyses," *Milbank Quarterly* 94, 3 (2016): 485–514, <https://doi.org/10.1111/1468-0009.12210>; Kusala Pussegoda, Lucy Turner, Chantelle Garritty, Alain Mayhew, Becky Skidmore, Adrienne Stevens, Isabelle Boutron, et al., "Systematic Review Adherence to Methodological or Reporting Quality," *Systematic Reviews* 6, 1 (2017): 131, <https://doi.org/10.1186/s13643-017-0527-2>; Ashlynn Kogut, Margaret Foster, Diana Ramirez, and Daniel Xiao, "Critical Appraisal of Mathematics Education Systematic Review Search Methods: Implications for Social Sciences Librarians," *College & Research Libraries* 80, 7 (2019): 973, <https://crl.acrl.org/index.php/crl/article/view/23613/30926>.
7. Katharina Allers, Falk Hoffmann, Tim Mathes, and Dawid Pieper, "Systematic Reviews with Published Protocols Compared to Those Without: More Effort, Older Search," *Journal of Clinical Epidemiology* 95 (2018): 102–10, <https://doi.org/10.1016/j.jclinepi.2017.12.005>; Long Ge, Jin-hui Tian, Ya-nan Li, Jia-xue Pan, Ge Li, Dang Wei, Xin Xing, et al., "Association between Prospective Registration and Overall Reporting and Methodological Quality of Systematic Reviews: A Meta-Epidemiological Study," *Journal of Clinical Epidemiology* 93 (2018): 45–55, <https://doi.org/10.1016/j.jclinepi.2017.10.012>; Centre for Reviews and Dissemination, University of York, "Welcome to PROSPERO: International Prospective Register of Systematic Reviews," 2022, <https://www.crd.york.ac.uk/prosperto/>.
8. Yasushi Tsujimoto, Hiraku Tsujimoto, Yuki Kataoka, Miho Kimachi, Sayaka Shimizu, Tatsuyoshi Ikenoue, Shingo Fukuma, Yosuke Yamamoto, and Shunichi Fukuhara, "Majority of Systematic Reviews Published in High-Impact Journals Neglected to Register the Protocols: A Meta-Epidemiological Study," *Journal of Clinical Epidemiology* 84 (2017): 54–60, <https://doi.org/10.1016/j.jclinepi.2017.02.008>.
9. Melissa L. Rethlefsen, Ann M. Farrell, Leah C. Osterhaus Trzasko, and Tara J. Brigham, "Librarian Co-Authors Correlated with Higher Quality Reported Search Strategies in General Internal Medicine Systematic Reviews," *Journal of Clinical Epidemiology* 68, 6 (2015): 617–26, <https://doi.org/10.1016/j.jclinepi.2014.11.025>; Deborah Meert, Nazi Torabi, and John Costella, "Impact of Librarians on Reporting of the Literature Searching Component of Pediatric Systematic Reviews," *Journal of the Medical Library Association* 104,





- 4 (2016): 267–77, <https://doi.org/10.3163/1536-5050.104.4.004>; Jonathan B. Koffel, “Use of Recommended Search Strategies in Systematic Reviews and the Impact of Librarian Involvement: A Cross-Sectional Survey of Recent Authors,” *PLOS One* 10, 5 (2015), <https://doi.org/10.1371/journal.pone.0125931>.
10. Krystal Bullers, Allison M. Howard, Ardis Hanson, William D. Kearns, John J. Orriola, Randall L. Polo, and Kristen A. Sakmar, “It Takes Longer Than You Think: Librarian Time Spent on Systematic Review Tasks,” *Journal of the Medical Library Association* 106, 2 (2018): 198–207, <https://doi.org/10.5195/jmla.2018.323>; Ahlam A. Saleh, Melissa A. Ratajeski, and Marnie Bertolet, “Grey Literature Searching for Health Sciences Systematic Reviews: A Prospective Study of Time Spent and Resources Utilized,” *Evidence Based Library & Information Practice* 9, 3 (2014): 28–50, <https://doi.org/https://doi.org/10.18438/B8DW3K>.
11. Sandra McKeown and Amanda Ross-White, “Building Capacity for Librarian Support and Addressing Collaboration Challenges by Formalizing Library Systematic Review Services,” *Journal of the Medical Library Association* 107, 3 (2019): 411–19, <https://doi.org/10.5195/jmla.2019.443>.
12. Amy Knehans, Esther Dell, and Cynthia Robinson, “Starting a Fee-Based Systematic Review Service,” *Medical Reference Services Quarterly* 35, 3 (2016): 266–73, <https://doi.org/10.1080/02763869.2016.1189779>.
13. Stephanie Clare Roth, “Transforming the Systematic Review Service: A Team-Based Model to Support the Educational Needs of Researchers,” *Journal of the Medical Library Association* 106, 4 (2018): 514–20, <https://doi.org/10.5195/jmla.2018.430>.
14. Knehans, Dell, and Robinson, “Starting a Fee-Based Systematic Review Service.”
15. Heather S. Healy, Matt Regan, and Jennifer Deberg, “Examining the Reach and Impact of a Systematic Review Service,” *Medical Reference Services Quarterly* 39, 2 .(2020): 125–38, <https://doi.org/10.1080/02763869.2020.1726150>; Emille Ludeman, Katherine Downton, Andrea Goldstein Shipper, and Yunting Fu, “Developing a Library Systematic Review Service: A Case Study,” *Medical Reference Services Quarterly* 34, 2 (2015): 173–80, <https://doi.org/10.1080/02763869.2015.1019323>.
16. Megan Kocher and Amy Riegelman, “Systematic Reviews and Evidence Synthesis: Resources beyond the Health Sciences,” *College & Research Libraries News* 79, 5 (2018): 248, <https://crln.acrl.org/index.php/crlnews/article/view/16967/18703>.
17. Amy Riegelman and Megan Kocher, “For Your Enrichment: A Model for Developing and Implementing a Systematic Review Service for Disciplines outside of the Health Sciences,” *Reference & User Services Quarterly* 58, 1 (2018): 22–27, <https://doi.org/10.5860/rusq.58.1.6837>.
18. Cornell University Library, “A Guide to Evidence Synthesis: Evidence Synthesis Institute for Librarians,” 2022, <https://guides.library.cornell.edu/evidence-synthesis/trainings>.
19. Stevie van der Mierden, Katya Tsaïoun, André Bleich, and Cathalijn H. C. Leenaars, “Software Tools for Literature Screening in Systematic Reviews in Biomedical Research,” *ALTEX [Alternatives to Animal Experimentation]* 36, 3 (2019): 508–17, <https://doi.org/10.14573/altex.1902131>; A. J. van Altena, R. Spijker, and S. D. Olabarriaga, “Usage of Automation Tools in Systematic Reviews,” *Research Synthesis Methods* 10, 1 (2019): 72–82, <https://doi.org/10.1002/jrsm.1335>.
20. Barbara Kitchenham and Pearl Brereton, “A Systematic Review of Systematic Review Process Research in Software Engineering,” *Information and Software Technology* 55, 12 (2013): 2049–75, <https://doi.org/10.1016/j.infsof.2013.07.010>; Mark Petticrew and Helen Roberts, *Systematic Reviews in the Social Sciences: A Practical Guide* (Malden, MA: Blackwell, 2006), <https://doi.org/10.1002/9780470754887>; Andrew S. Pullin and Gavin B. Stewart, “Guidelines for Systematic Review in Conservation and Environmental Management,” *Conservation Biology* 20, 6 (2006): 1647–56, <https://doi.org/10.1111/j.1523-1739.2006.00485.x>.
21. Matthew J. Page, Joanne E. McKenzie, Patrick M. Bossuyt, Isabelle Boutron, Tammy C. Hoffmann, Cynthia D. Mulrow, Larissa Shamseer, et al., “The PRISMA [Preferred Reporting Items for Systematic Reviews and Meta-Analyses] 2020 Statement: An Updated Guideline for Reporting Systematic Reviews,” *BMJ* 372 (2021), <https://doi.org/10.1136/bmj.n71>; PRISMA, “PRISMA Extensions,” 2021, <http://www.prisma-statement.org/Extensions/>.