


# Chapter 17

## New Data–Related Roles for Librarians: Using Bibliometric Analysis and Visualization to Increase Visibility of Research Impact

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### ABSTRACT

*From applying for competitive grants to showcasing institutional collaboration and research trends, the need for research institutions to demonstrate and increase visibility of research impact is growing. The authors discuss core competencies needed to support bibliometric research and present active and completed impact measurement and visualization (IMV) projects, providing examples from health sciences and academic collaborations. For those considering development of a similar area of expertise within their library, an overview of necessary skillsets, tools, and recommendations for team building and scalability are described. IMV has the potential to be developed in libraries and integrated across research domains. As library roles continue to shift to be more data-centric, it is ever more important for libraries to identify ways to expand information professionals' data skills so that they can be seen as indispensable partners in the data ecosystem.*

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## **INTRODUCTION**

The University of North Carolina at Chapel Hill (UNC-CH), had annual research awards of \$1.05B in 2020, out of which, federal funding accounted for over \$700M. The increasingly competitive nature of obtaining grants and emphasis on demonstrating strong collaborative networks afforded an opportunity for the libraries to envision how skills in data and data visualization could be showcased to promote research and collaboration and how collaborative networks can leverage expertise.

Scholarly journals are one of the most important venues for researchers to share their research and report findings (Moher & Altman, 2015). Globally, the number of scholarly publications in the biomedical and health sciences field has grown exponentially (Oh, et al., 2017). In the United States, the number of journals indexed in PubMed Medline increased almost 50% from 1995 to 2017; the total number of citations in Medline doubled reaching 813,598 in the last 20 years, and in 2017, on average, about 52 new citations were added to the PubMed Medline database per day (NLM, 2018). While posing challenges in publication searching and management, the proliferation of research publications contributes to advancing scientific discovery.

The bibliographic or citation information of journal publications provides rich information about research activities, productivity collaboration, funding agencies, research influence and topics through various metadata fields (e.g., title, author, affiliation, grant support/funding details, citation count, and abstract). Therefore, bibliometrics, referring to the quantitative and statistical methods to study various aspects of a selected publication cohort (Pritchard, 1969), has been utilized to help disclose latent research activities and assess research outcomes across disciplines. Particularly, the bibliometrics method has been identified as a core method to evaluate research impact especially in health sciences domains (Milat, Bauman, & Redman, 2015; Ellegaard, & Wallin, 2015). Energized by the state-of-the-art bibliometric analysis software (e.g., VOSviewer, R Bibliometrix/Biblioshiny), advanced bibliometric resources and tools (e.g., Scopus, Web of Science, iCite), measures (e.g., Relative Citation Ratio, Field-weighted Citation Impact), and technologies (e.g., text mining), bibliometrics has been widely used across disciplines to provide instant insights.

This chapter provides a roadmap for librarians seeking to partner and engage in new data-related roles through bibliometric analysis and data visualization. The authors share experience around developing expertise including core competencies, complementary skills, considerations around building capacity, and establishing long-term partnerships. Further, a detailed description of seven projects, each offering different highlights, is provided in a series of case studies with accompanying visualizations. Finally, recommendations to consider and future research directions are offered.

## **BACKGROUND**

In recent years at UNC-CH, there has been an increase in requests, particularly from biomedical and health sciences disciplines, for bibliometric analytics and visualization services. These disciplines have received significant grant funding from federal government or industry sectors and have pressing needs to report their research output and demonstrate research impact. To address this burgeoning need, an Impact Measurement and Visualization (IMV) team was established at the UNC Health Sciences Library (HSL) in 2017. The formulation of the IMV team was envisioned to provide support for (1) curriculum revision for a professional school (Dodd, Hayes, Yu, & Mani, 2018); (2) collaborative grant application

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