Evaluative Bibliometrics Meet the CTSI

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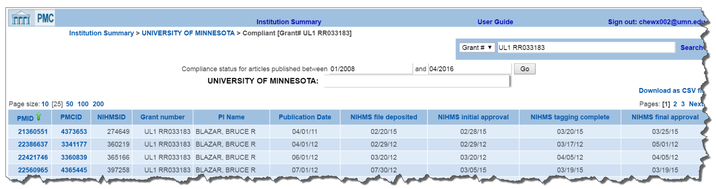
Bibliometrics, the application of quantitative analysis to publications, is of growing importance for institutions, departments, and research centers. For Clinical and Translational Science Award (CTSA) centers, these metrics are both a tool for assessment and for self-advocacy during the renewal process.

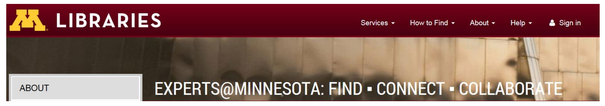
The University of Minnesota's Clinical and Translational Science Institute (CTSI) joined the CTSA consortium in 2011. Since that time, the CTSI had issued more than $22.2M in research funding to over 325 researchers, and has provided research guidance, education, and access to data resources, including a clinical data repository, to over 1,000 researchers (1).

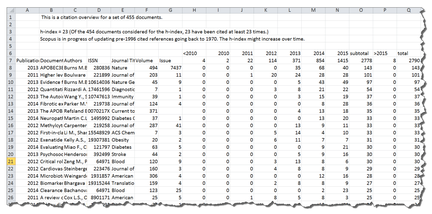
In the spring of 2015, the Health Sciences Libraries were approached by the by the University of Minnesota's CTSI Monitoring & Evaluation Team to engage in a process of identifying and implementing the most appropriate bibliometrics for evaluation purposes.

What We Did



NIH's Public Access Compliance Monitor was used to retrieve articles based on grant information provided by the CTSI. Citation counts were retrieved from Scopus. As a component of our research networking system, Experts@Minnesota, an Elsevier product, publication information available through Scopus is generally more accurate for U of M researchers than information available through other data sources.





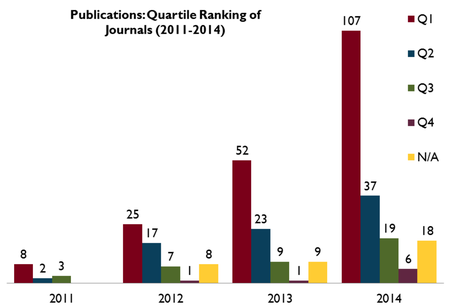
At this time, the University of Minnesota was engaging in a pilot of SciVal (formerly SciVal Spotlight), which allowed for comparison of Scopus citation data between University of Minnesota research groups and other institutions and research groups.

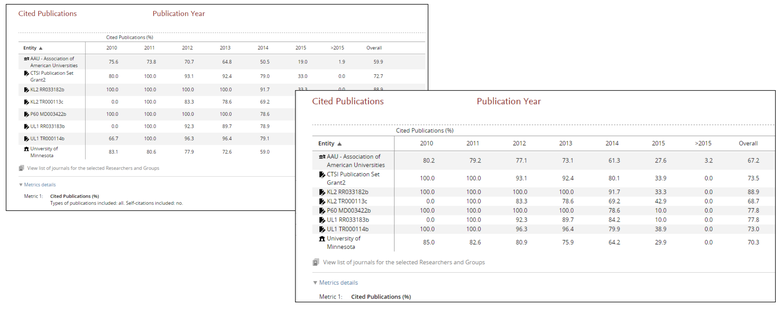
SciVal

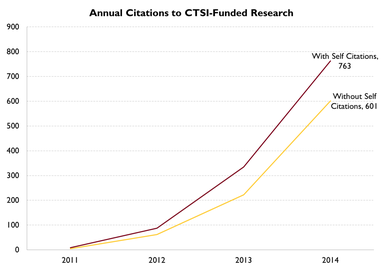
What We Found

Journal Citation Reports was used to identify journal impact factor and quartile rankings for all associated publications. The quartile ranking of impact factor represents the impact factor distribution within a given field. This measure helps to contextualize impact factor within a discipline and account for the differing citation behaviors in different fields. For five grants, we identified 490 articles published by CTSI-affiliated researchers. 464 of these articles were matched to Scopus data and included in the analysis. The articles were published in 247 journals, 49% (n=121) of which ranked within the top 25% in their field according to impact factor.

Citations counts both including and excluding self-citations were used in this analysis. While citation counts including self-citations may indicate how researchers have built upon their previous work to advance science, the exclusion of self-citations assists in demonstrating the impact of research on external groups and the discipline broadly.







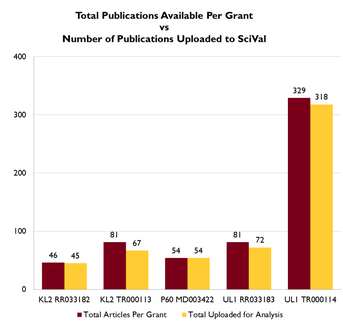
Combining publication information with citation data from Scopus, we found that, excluding self-citations, these articles had been referenced by 1,156 articles published in 692 journals. Considering the data between 2010 and 2015, we visualized the growth of publications, citations, and publication venue rankings over time.

What We Learned

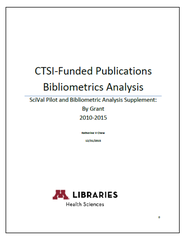
While a variety of metrics are readily available, incorporating a minimal number of easily understood measures was essential in developing a meaningful analysis which would be of value to a broad audience. All bibliometrics have limitations in describing research impact. Such limitations must be described in the interpretation of the data. Providing this information allows the researcher to interpret metrics effectively and to accurately present this information as evidence of research impact.

The underlying data source will have a significant impact on citation counts. While there were no duplicate records or apparent errors in the retrieved publication information, such errors are not uncommon in publication data.

Due to the disambiguation work which had occurred to support our research networking system, a more refined data source was available. However, different data sources would lead to different results, requiring that the impact of data source be clearly described.



For the first time the CTSI had the ability to benchmark supported publications against research publication productivity at the University of Minnesota, at other universities, across disciplines, against six other CTSA sites and track progress across the years of the CTSA grant.



By leveraging existing resources, the Libraries provided standardized bibliometric analytics that strengthened CTSI's proposal. The Libraries was able to contribute high quality, standardized metrics to evaluating the University CTSI's impact in clinical translational and team science of their contributions to advancing health research that can make a difference to individual and population health.

References

1. Clinical and Translational Science Institute. Impact. 2015. http://www.ctsi.umn.edu/about/impact

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