

## Best Practices for the Use of Scholarly Impact Metrics for Medicine

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### Developing a Narrative About Scholarly & Societal Impact

We often have to develop a narrative of the impact of our scholarly and societal work for a dossier for tenure or promotion<sup>1</sup>, grant proposals, or for an academic program review<sup>2</sup>.

A scholarly impact narrative is a concise statement that explains the quality, productivity over time, and impact of your scholarly or societal work. The narrative often reports on your past accomplishments, present activities, and future plans. For instance, an impact narrative needed for your tenure and promotion dossier

*"...is your opportunity to make your own case. The statement communicates a quick sense of whether you know who you are, where you've been, and where you're going in your career."*

*"...the personal statement provides context for your achievements beyond what is visible on the c.v., showing that they fit into a meaningful plan for your development as a scholar, teacher and university citizen."*

It should provide an interpretation of your work and go beyond simple reiteration of the content of your vita. The statement, in conjunction with the CV, should provide evidence that significant research ideas and research activities are coming to fruition and that there is evidence of future promise.

### Evaluating Your Scholarly Impact

Citation analysis and other bibliometric methods help justify your scholarly impact narrative by providing evidence of three characteristics of scholarship: scholarly output, scholarly impact, and the nature and development of scholarship over time or discipline<sup>3</sup>. There are three concepts to keep in mind to reliably use citation analysis and other metrics of scholarly and societal impact:

**Discipline-based.** The choice of metrics and their interpretation needs to account for the type of scholarly objects (i.e. articles, monographs, digital projects, data sets, or public works) and other practices of a disciplinary community. Therefore, cross-disciplinary comparisons of scholarly impact metrics are not likely valid<sup>4</sup>.

**Scholarly object-level metrics.** Traditional methods to assess scholarly impact have focused on journal or press quality. Current approaches use these assessments but emphasize article-level and book-level metrics<sup>5</sup>.

**Multifaceted.** Scholar impact is a complex construct that is best approached using multiple indicators<sup>6</sup> coupled with expert assessment<sup>7</sup>.

Your analysis can extend beyond simple quantitative measures of total citation counts or H-indexes. For instance, citations over time can highlight work that has long-term significance. You can also show that your ideas are being incorporated into important



Source: UNSW Research Impact Guide: <http://subjectguides.library.unsw.edu.au/researchimpact>

<sup>1</sup> <http://dof.tamu.edu/node/23>

<sup>2</sup> <http://provost.tamu.edu/initiatives/academic-program-review>

<sup>3</sup> van Raan, A.F.J. 1993. Advanced bibliometric methods to assess research performance and scientific development: basic principles and recent practical applications. *Research Evaluation*: 3(3):151-166.

<sup>4</sup> Hicks et al., 2015. *Nature* 520:430-431.

<sup>5</sup> <http://www.sparc.arl.org/resource/sparc-article-level-metrics-primer>

<sup>6</sup> Bollen, J. et al. 2009. A principal component analysis of 39 scientific impact measures. *PLoS ONE*: 4(6): e6022.

<sup>7</sup> Hicks et al., 2015. *Nature* 520:430-431.

research in your field, research outside your discipline, or are being cited by international scholars by characterizing the scholars that are citing your work.

Quantitative and qualitative metrics of scholarly impact are useful in justifying research narratives included in annual evaluations, P&T packages, and departmental strategic plans or program reviews. The Dean of Faculties requires contextual information be provided in P&T packages along with scholarly impact metrics to allow scholars outside your discipline to evaluate a faculty's scholarly impact metrics.

### **Open Access Publishing & Scholarly Impact**

Publishing as *open access appears to have a significant, positive impact on metrics of scholarly impact, such as citation rates*. Open access (OA) scholarly literature is digital, online, free-of-charge, and free of most copyright and licensing restrictions, where the author, as copyright holder, consents in advance to let users copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship<sup>8</sup>. Under this model, authors *retain copyright of their work* in contrast to commercial journals where authors typically give up all rights to the publisher including any unanticipated future applications or usage. The Texas A&M Libraries are an active advocate of open access, believing that open access can help address both the price barriers and the permission barriers that restrict and undermine global access to the products of Texas A&M's scholarly and creative work.

There are two ways authors can provide open access to their work: (1) self-archiving their journal articles in an open access repository, also known as 'green' open access, or (2) publishing in an open access journal, known as 'gold' open access<sup>9</sup>. With green open access, authors publish in any journal and then self-archive a version of the article for *gratis* public use in their institutional repository (oaktrust.library.tamu.edu) or in a disciplinary repository such as PubMed Central. With gold open access, authors publish in open access journals, which provides immediate access to the articles, usually on the publisher's website. Since open access journals do not charge subscriptions, these journals use a different business model where authors pay an open access-publishing fee. The library has a fund, OAK Fund<sup>10</sup>, to help cover those fees.

An analysis of open access articles in the hybrid journal *Nature Communications* showed enhanced downloads and almost doubling of citation rates<sup>11</sup>. This relationship<sup>12</sup> appears to be significant for many scientific and social science disciplines where the tools for citation tracking are more robust and comprehensive and particularly true for scholarship made available through repositories that are routinely used by the disciplinary communities, such as ArXiv in the physics community. The impact of open access on citation rates appears to be due to the articles being freely available (OA) and/or available earlier than those available only through print.

### **Recommendations to Enhance Your Scholarly Impact**

We recommend three general strategies to enhance your scholarly reputation:

*Build your online identity visible & network.* Get an ORCID. Have up-to-date, public scholarly profiles on your website, academic social network sites (i.e., ResearchGate, LinkedIn, or Academia.edu), and Google Scholar. Consider blogging, tweeting or alternative forms of informal writing that helps explain the significance of your research to a wide audience.

*Make your scholarly work accessible.* Publish open access versions of your work using open access journals such as PLOS One or relevant repositories, including the Texas A&M institutional repository, OAK Trust (oaktrust.library.tamu.edu).

*Track your scholarly impact metrics.* Use Google Scholar or one of the other databases listed below to track the impact of your work. Alternative metrics (altmetrics) can provide rapid feedback.

Each of the databases suggested below have different strengths that are dependent on the scholarly literature being indexed by the database. In all cases, except Google Scholar and the National Institutes of Health iCite, the library provides faculty access to the different databases so they can collect their own data. The library provides training on using any of these tools. Contact the Office of Scholarly Communications or the Medicine subject liaison in the library for help.

### **Suggested Metrics For Different Types of Scholarly and Creative Works**

Each of the databases below, available through the library search page, have different strengths that are dependent on the scholarly literature being indexed by the database. For instance, the Web of Science and Scopus index far more social science and biomedical journals and books than those in the arts and humanities. NIH's iCite is limited to articles available in PubMed.

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<sup>8</sup> Suber, P. *Open Access*. Cambridge: The MIT Press, 2012. Epub.

<sup>9</sup> <http://www.nature.com/nature/focus/accessdebate/21.html>

<sup>10</sup> [http://library.tamu.edu/services/scholarly\\_communication/oakfund.html](http://library.tamu.edu/services/scholarly_communication/oakfund.html)

<sup>11</sup> The report: [http://www.nature.com/press\\_releases/ncommsreport2014.pdf](http://www.nature.com/press_releases/ncommsreport2014.pdf).

<sup>12</sup> Harnad, S. and T. Brody. 2004. Comparing the impact of open access (OA) vs. non-OA articles in the same journals: D-Lib Magazine 10(June).  
Moed, H. F. 2007. The effect of "open access" upon citation impact: An analysis of ArXiv's Condensed Matter Section. J. Am. Soc. Info. Sci. Technol. 58(13): 2145-2154.

Antelman, K. 2004. Do open-access articles have a greater research impact? College & Research Libraries 65:372-382.

Scholarly Object: Journal Articles

Metric	Data Source
Mentions:	Number of social media mentions: Blogs, Facebook, and Twitter
Article usage:	Number of times accessed, viewed or downloaded: Open access repositories, journal websites.
Article-level impact: Number of <a href="#">Citations</a>	<a href="#">ISI Web of Science</a> : citations aggregated from articles published in and cited by journals indexed by WoS <sup>13</sup> <a href="#">Scopus</a> : citations aggregated from articles published in and cited by journals indexed by Scopus <sup>14</sup> <a href="#">Google Scholar: citations aggregated by web crawling of online peer-reviewed and nonpeer-reviewed content.</a> <a href="#">NIH iCite (Citations per year): max, mean, standard error of the mean (SEM), and median (MED) of the citations per full calendar year for articles appearing in PubMed in the selected group</a> <sup>15</sup>
Article-level impact:	h-index: <a href="#">ISI Web of Science</a> , <a href="#">Scopus</a> , and Google Scholar. The h-value calculated by the different databases are not equivalent since they index different collections of journals. Relative Citation Ratio: NIH iCite. The citations/year of each paper, normalized to the citations per year received by NIH-funded papers in the same field and year. A paper with an RCR of 1.0 has received the same number of cites/year as the median NIH-funded paper in its field. NIH Percentile: NIH iCite. Percentile rank amongst NIH-funded publications.
Quality of Journal	<a href="#">Journal impact factor: InCites Journal Citation Reports</a> for Journals indexed in ISI Web of Science. <a href="#">Citescore</a> from Scopus. <a href="#">SCImago Journal Rank (SJR): SCImago Journal &amp; Country Rank</a> for journals indexed in <a href="#">Scopus</a> . <i>Other Journal information:</i> <a href="#">Ulrich's Periodicals Directory</a> or <a href="#">The Serials Directory</a>

Scholarly Object: Books

Metric	Data Source
Mentions:	Number of social media mentions: Blogs, Facebook, and Twitter
Book usage:	Number of times accessed, viewed or downloaded: Open access repositories, Publisher websites. Sales: Publisher websites, Amazon or Barnes & Noble websites. Library ownership of book: <a href="#">OCLC Worldcat Database</a> .
Book-level impact: Number of citations	<a href="#">ISI Web of Science</a> : citations aggregated from books indexed by the Books Citation Index <sup>16</sup> <a href="#">Scopus</a> : citations aggregated in books indexed by Scopus <sup>17</sup> <a href="#">Google Scholar: citations aggregated by web crawling of online peer-reviewed and nonpeer-reviewed content.</a> Various databases: Citations manually counted for TAMU author through full text search of text. Examples of appropriate databases include <a href="#">JSTOR</a> , <a href="#">Google Books</a> , <a href="#">Proquest</a> , and <a href="#">Oxford Journal Search</a> .
Book-level impact:	Cited/Included on Syllabi/Point of Care Clinical Tools/Bibliographies/LibGuides: <a href="#">Deep Google search</a> or <a href="#">search through LibGuides</a> (Library resources created by librarians for courses and departments). Reviews or awards: Deep Google search; <a href="#">LexisNexis Academic</a> ; <a href="#">EBSCO Newspaper Source</a> .
Quality of Press	Peer Review

Scholarly Object: Data sets and Nonpeer-reviewed Objects (presentations, posters, documents, video, recordings, etc.) Curated in OAK Trust or other Repositories

Metric	Data Source
Mentions:	Number of social media mentions: Blogs, Facebook, and Twitter. (PlumX tracks this in OAK Trust)
Usage:	Number of times accessed, viewed or downloaded. (PlumX tracks this in OAK Trust)
Number of citations	OAK Trust: Citations from PlumX that derives citations from Scopus. <a href="#">Google Scholar: citations aggregated by web crawling of online peer-reviewed and nonpeer-reviewed content.</a>

<sup>13</sup> The list of journals indexed by the Web of Science: <http://ip-science.thomsonreuters.com/mjl/>

<sup>14</sup> <https://www.elsevier.com/solutions/scopus/content>

<sup>15</sup> <https://icite.od.nih.gov/help>

<sup>16</sup> [http://wokinfo.com/products\\_tools/multidisciplinary/bookcitationindex/](http://wokinfo.com/products_tools/multidisciplinary/bookcitationindex/)

<sup>17</sup> <http://www.elsevier.com/online-tools/scopus/content-overview>

