Enhancing the Impact of Your Research

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Metrics and Impact Core

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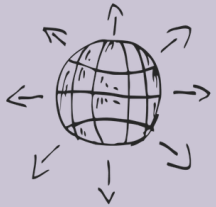

In today's presentation:

- Discuss the concept of research impact
- Cover strategies for enhancing research impact
- Demonstrate some tools and resources

Questions?

Interrupt me as needed, if you feel comfortable. Otherwise, I'll watch for raised hands (in person) or questions in the chat (on Zoom).

Audience choice for the demonstration

During the presentation we will cover several tools and resources. If we have time at the end, you can decide as a group which tool or resource can be used for a live demonstration.

Defining Research Impact

What is research impact?

"Research impact broadly means demonstrable and beneficial change in behaviors, beliefs and practices."

Julie Bayley, Director of Research Impact at the University of Lincoln

- US National Institutes of Health: The likelihood for the project to exert a sustained, powerful influence on the research field(s) involved.
- Research England: An effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life beyond academia.
- US National Science Foundation: The potential [for your research] to benefit society and contribute to the achievement of desired society outcomes.
- Australian Research Council: The contribution that research makes to the economy, society, environment or culture, beyond the contribution to academic research.

Why might *we* think about research impact?

- Promotion & Tenure
- Grant Applications
- Progress Reports
- Program Review

Though there are other many reasons ….

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What are the types of research impact?

- **Understanding and awareness** – meaning your research helped people understand an issue better than they had before
- **Attitudinal** – your research helped lead to a change in attitudes
- **Economic** – your research contributed to cost savings, or costs avoided; or increases in revenue, profits or funding
- **Environmental** – benefits arising from your research aid genetic diversity, habitat conservation and ecosystems
- **Health and well-being** – your research led to better outcomes for individuals or groups
- **Policy** – your research contributed to new or amended guidelines or laws
- Other forms of **decision-making** and **behavioural** impacts
- **Cultural** – changes in prevailing values, attitudes and beliefs
- Other **social** impacts –such as access to education or improvement in human rights
- Capacity or **preparedness** – research that helps individuals and groups better cope with changes that might otherwise have a negative impact.

What types of outputs contribute to impact?

Concept	Possible Indicator
Scientific output	Publications (quantity/quality)
Scientific impact	Citations received by academic papers, clinical guidelines, patents, policy reports, co-authored publications with industry
Scientific collaboration	Number or type of collaborators on grant applications, co-authored publications
Societal impact	Publishing clinical guidelines, patents, policy reports, mentions in social media,
Mobility	Change in researcher affiliation
Advancement of Knowledge	Renewal of research study, duration of study, type of funding sources, generation of ancillary research study
Economic Benefit	Research study findings result in reduced costs in the delivery of health care services.
Interdisciplinarity	Disciplinary classification of (cited) publications

Describing Research Impact

Research Impact Narratives

Narratives or case studies enable a story to be told and impact to be placed in context.

REF Impact Case Studies
https://impact.ref.ac.uk/casestudies/

Contributions to Science (NIH)

- the historical background that frames the scientific problem;
- the central finding(s);
- the influence of the finding(s) on the progress of science or the application of those finding(s) to health or technology; and.
- your specific role in the described work.

Benefits of Narratives	Considerations for Narratives
Uses quantitative and qualitative data	Automated collation of evidence is difficult
Allows evidence to be contextualized and a story told	Incorporating perspective can make it difficult to assess critically
Enables assessment in the absence of quantitative data	Time-consuming to prepare and assess
Allows collation of unique datasets	Difficult to compare like with like
Preserves distinctive account or disciplinary perspective	Rewards those who can write well, and/or afford to pay for external input

Teresa Penfield, Matthew J. Baker, Rosa Scoble, Michael C. Wykes, Assessment, evaluations, and definitions of research impact: A review, *Research Evaluation*, Volume 23, Issue 1, January 2014, Pages 21–32, https://doi.org/10.1093/reseval/rvt021

Research Impact Metrics

Narratives can be used in conjunction with **metrics**, to provide a more complete picture of impact.

Bibliometric examples

H-index: based on analysis of publication data using publications and citations to provide *"an estimate of the importance, significance, and broad impact of a scientist's cumulative research contributions*."

Relative Citation Ratio: citation-based measure of scientific influence of a publication. It is calculated as the citations of a paper, normalized to the citations received by NIH-funded publications in the same area of research and year.

Journal Impact Factor: The Journal Impact Factor is a measure reflecting the annual average (mean) number of citations to recent articles published in that journal.

Alternative metric examples

News Mentions: The number of mainstream online news and magazine outlets that reference a research output

Policy Mentions: The number of times a research output has been cited in policy documents from government bodies or NGOs.

Github: Forks, Collaborators, Watchers:
Github "Forks" are created when a user makes a copy of a repository. A "collaborator" is another Github user who is able to perform many actions on the files within the repository, including edits. "Watchers" are Github users who have asked to be notified of activity in a repository.

A Quick Note: Databases

Database	Item Count and Content Coverage	Availability	Basic Metrics	Advanced Metrics
Google Scholar by Google	**389M records** [articles, books, theses, abstracts, court opinions, etc.]	Full free version	Google Scholar	Publish or Perish (free tool)
PubMed.gov by US National Library of Medicine	**34M records** [5,200 Medline journals as well as life sciences journals from PubMed Central and books from NCBI Bookshelf]	Limited free version; Galter Library full version	iCite	iCite (free tool)
Scopus by Elsevier	**75M records** [210K books, 120K conferences, 44M patents, 25,100 journals]	Limited free version; Galter Library full version	Scopus	SciVal (no access at Northwestern)
Web of Science by Clarivate Analytics	**79M records** [119K books, 220K conferences, 10M datasets, 46M patents, 34,586 journals]	Limited free version; Galter Library full version	Web of Science	InCites (limited Galter Library access)

Last updated 03/2021

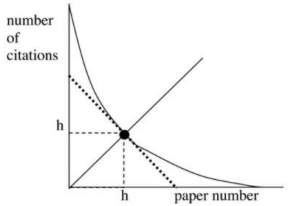
h-index

Use Case

The h-index is used as evidence of the scholarly influence of an author's, or group of authors', body of work.

Definition

The h-index is equivalent to the number of h publications by an author that have been cited h number of times.



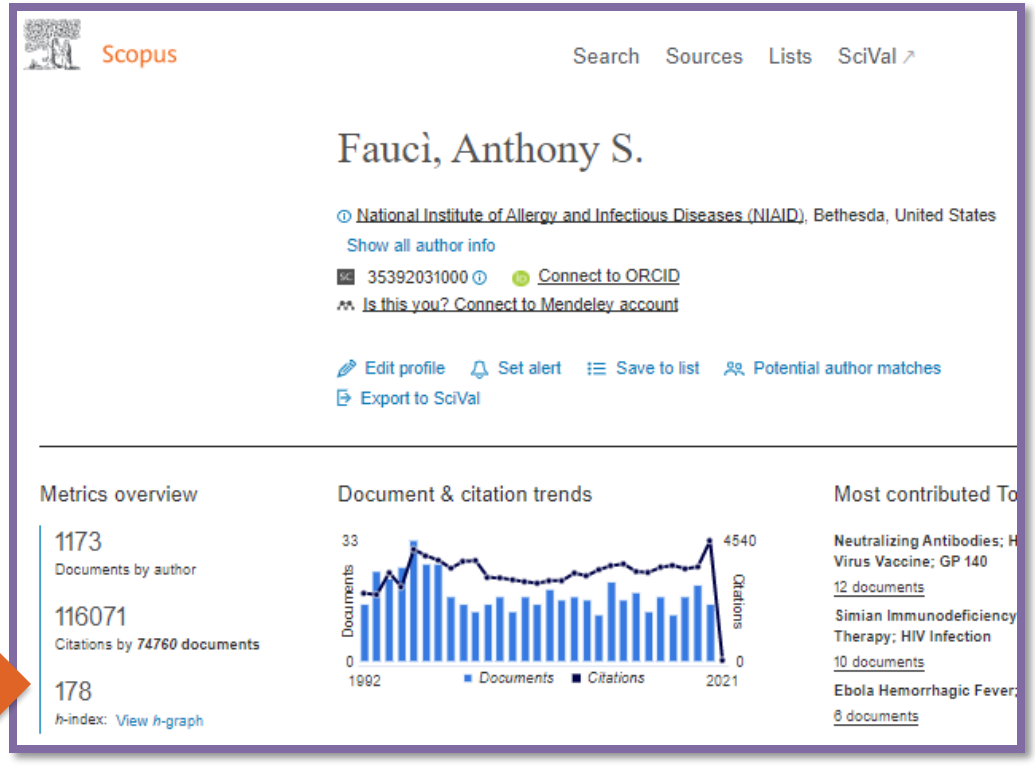
Location

The h-index can be calculated by hand, however it is offered in databases such as Scopus, Web of Science, and Google Scholar.

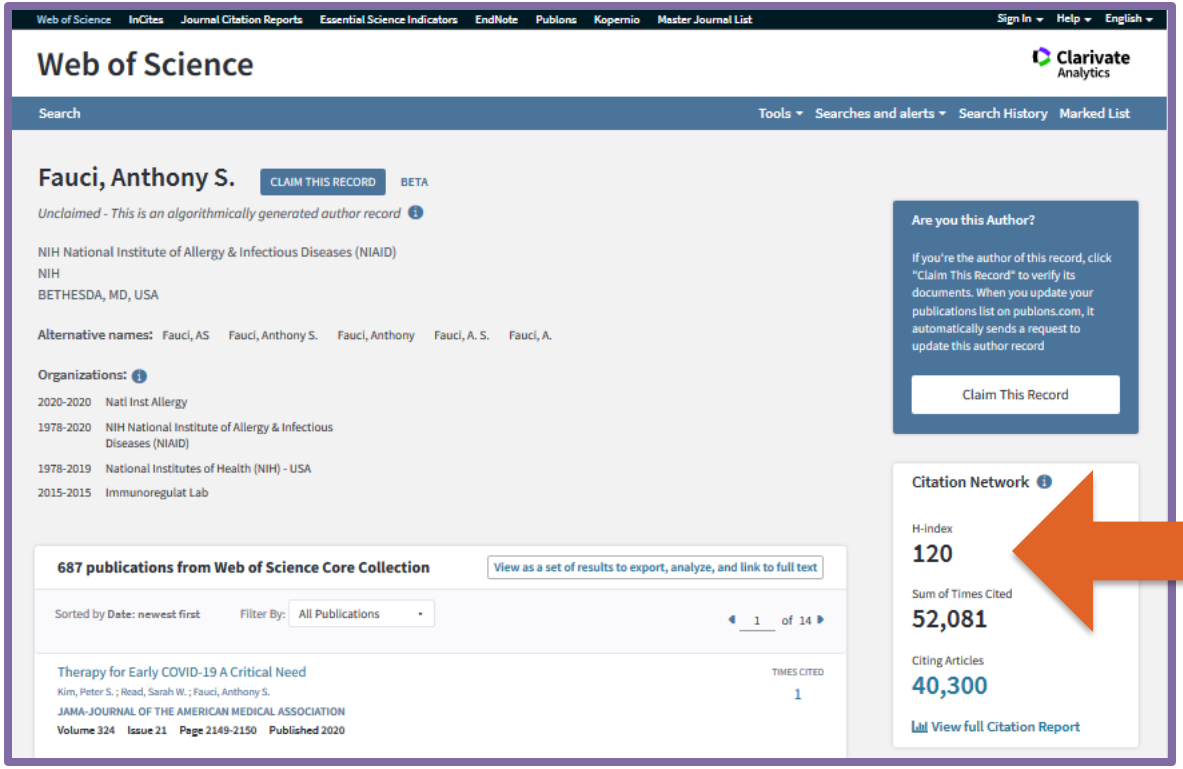
Caveats

- Not field normalized.
- Point of time in a career will affect this metric.
- Inconsistent when you compare it from database to database.

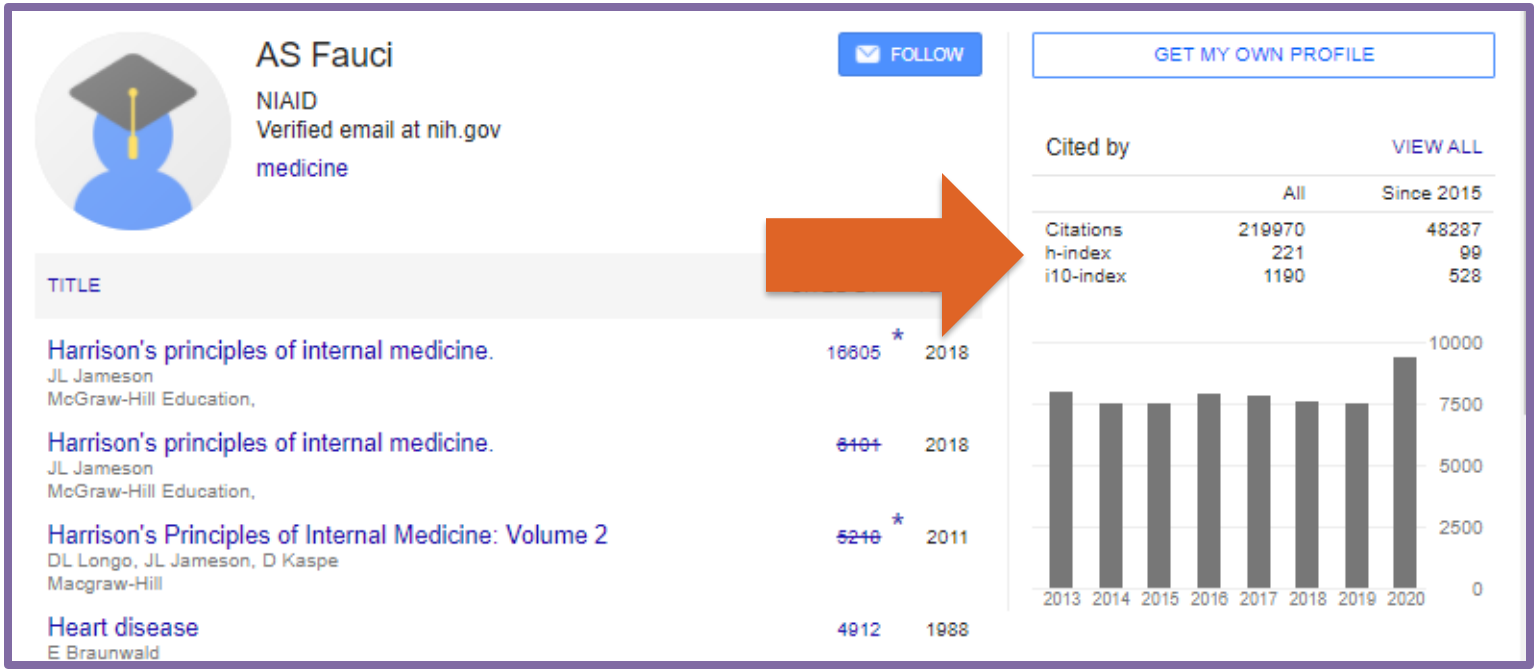
Where to find it: h-index



Where to find it: h-index



Where to find it: h-index



Final Thoughts: h-index

Metric statement: *Dr. Fauci has created an output of 1174 documents between 1965 and 2020, and his h-index is 178 (Scopus).*

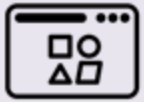
What that means: *Dr. Fauci has at least 178 papers that have been cited at least 178 times.*

h-index = 10
[10 papers w/
10 citations each]

? = ?

h-index = 10
[10 papers w/
10 citations each
AND
90 papers w/
9 citations each]

Citation Count



Use Case

Citation count allows you to go beyond a number and describe why and where important ideas are spread from a researcher's original work to subsequent citing works.

Definition

Citation count is the number of times an article is cited in other bodies of literature.

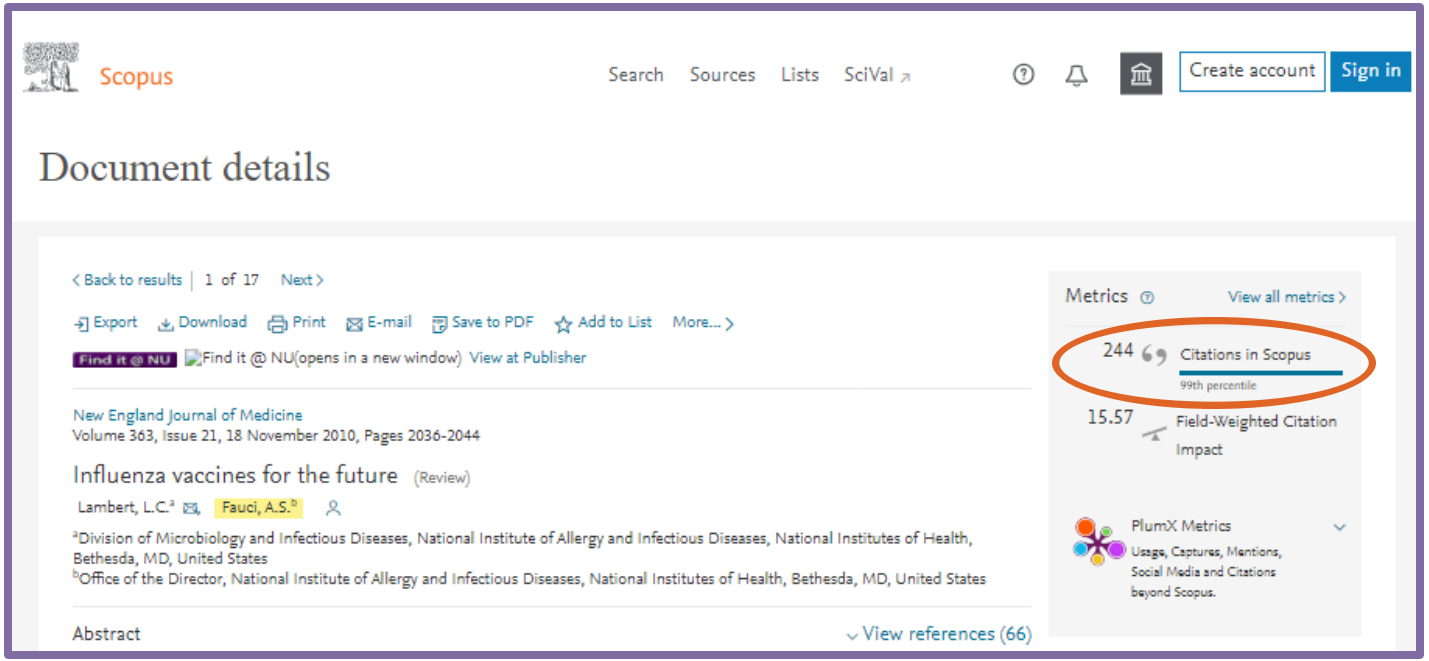
Location

Citation databases including Google Scholar, Scopus, Web of Science, and Dimensions, and the citation tool iCite.

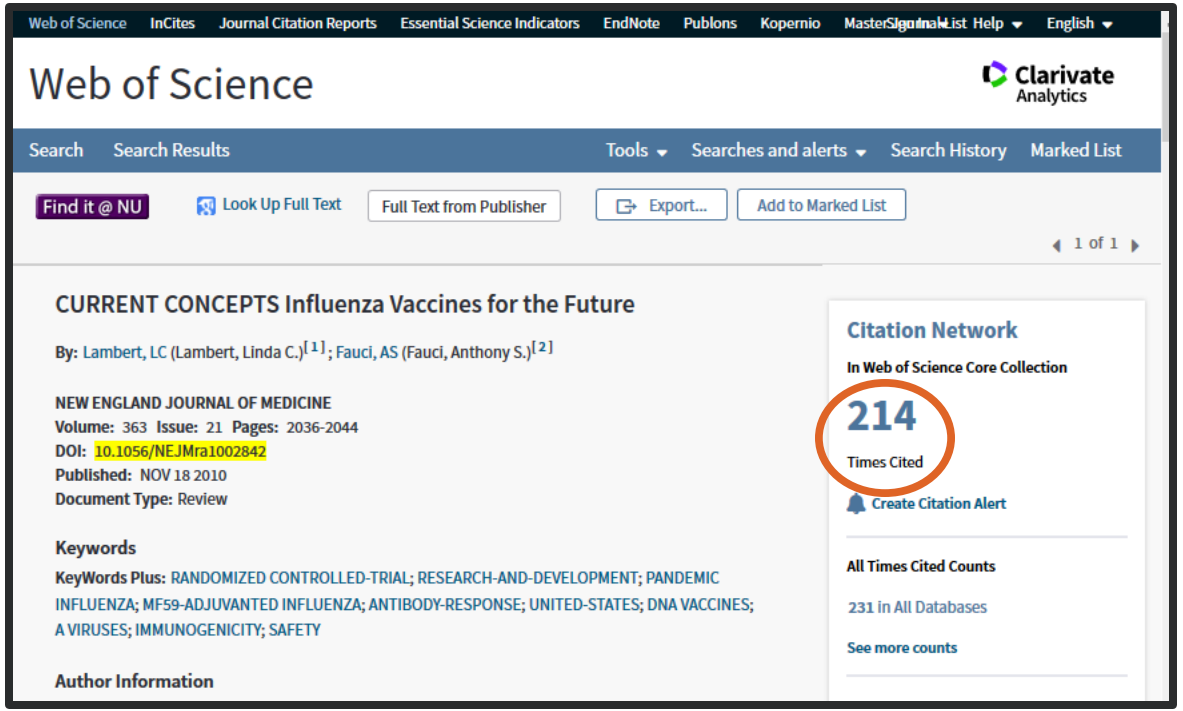
Caveats

- **Not field normalized.**
- **Inconsistent when you compare it from database to database.**
- **Citations are impacted by the age of the paper.**
- **Difficult to track citations to unpublished articles such as preprints or white papers.**

Where to find it: Citation Count



Where to find it: Citation Count



Where to find it: Citation Count

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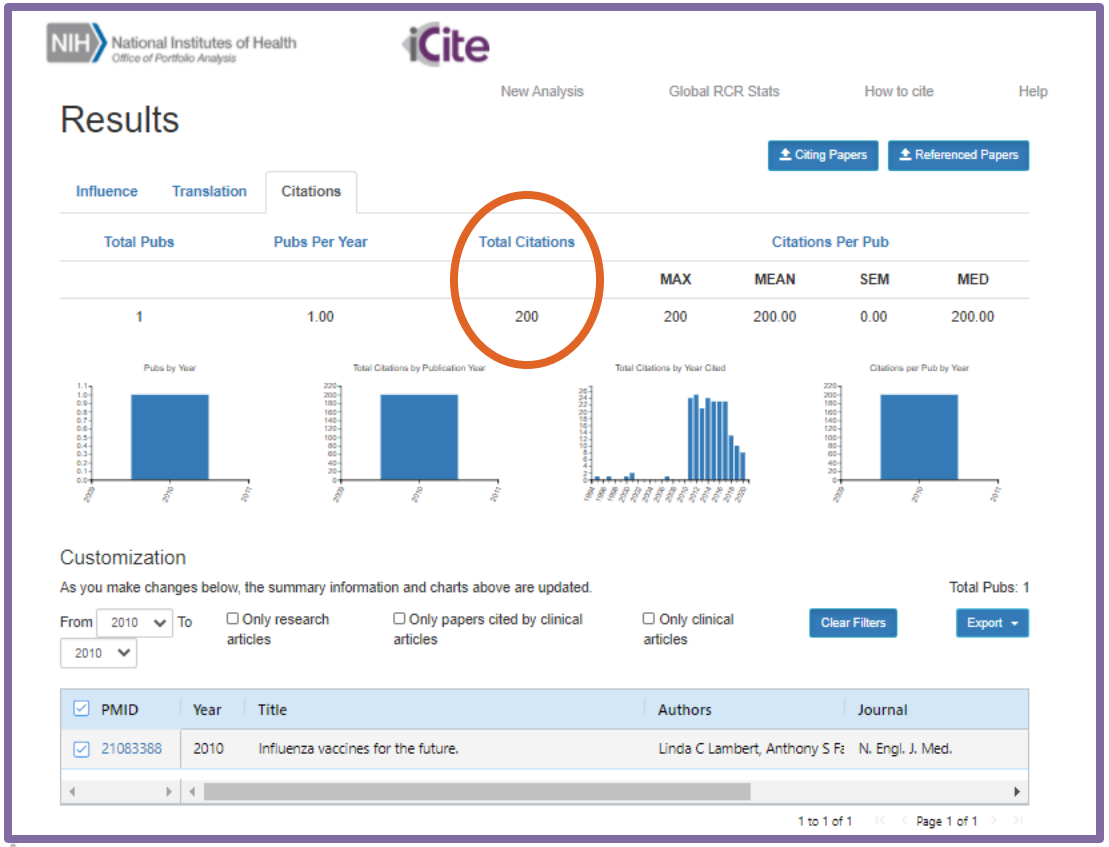


Final Thoughts: Citation Count

Metric statement: *The review article "*Influenza vaccines for the future" *which was co-authored by Dr. Fauci has 244 citations (Scopus).*

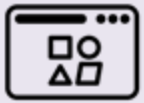
What that means: *There are 244 publications that have used this paper in their reference list since the paper was published in 2010.*

Self citations: To include or not to include?

For: You are an expert in a new field or are making strides in a field that continues to build on itself.

Against: Including self-citations makes you concerned that there will be an impression that you are gaming the system.

Journal Impact Factor (JIF)



Use Case

The JIF is useful in comparing the relative influence of journals within a discipline, as measured by citations.

Definition

The JIF is calculated by taking all citations to the journal in the current JCR year to items published in the previous two years, divided by the total number of scholarly items (these comprise articles, reviews, and proceedings papers) published in the journal in the previous two years.

$$\text{2019 JIF} = \frac{\text{Citations in 2019 to items published in 2017 + 2018}}{\text{Number of citable items in 2017 + 2018}}$$

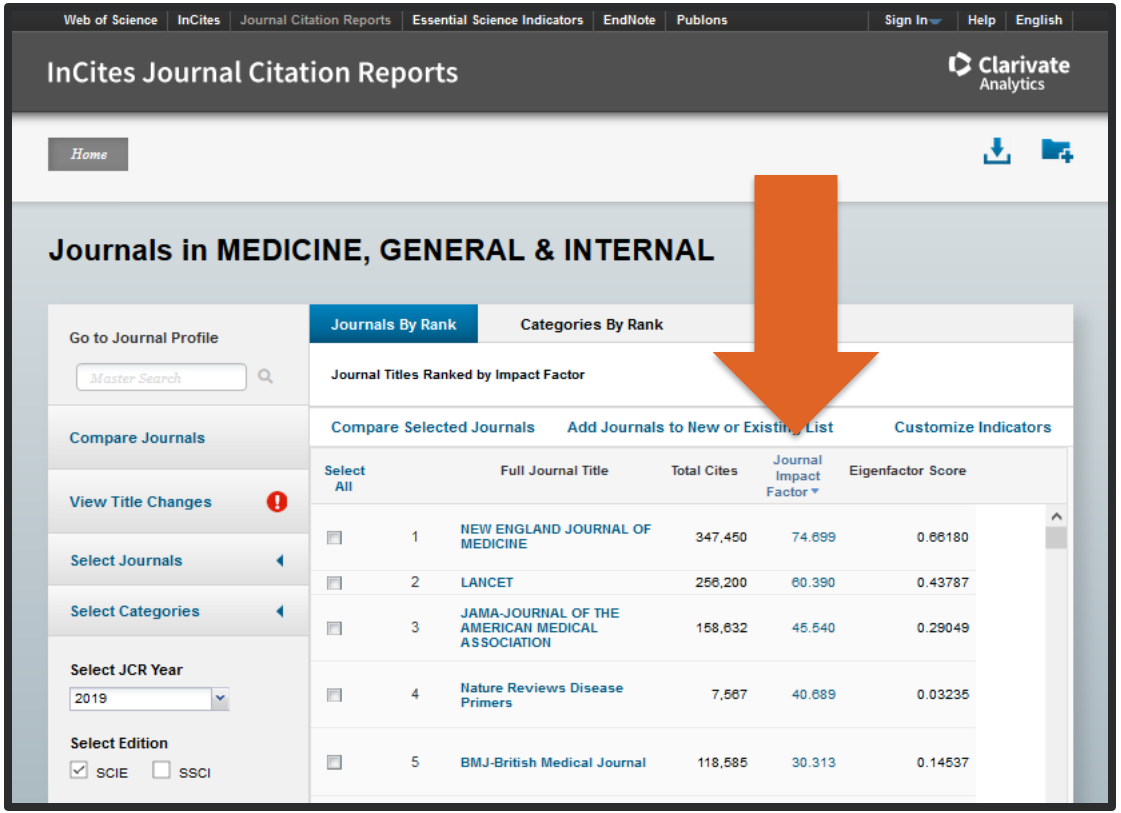
Location

The JIF is located in the Journal Citation Reports (WOS).

Caveats

- **Not field normalized.**
- **Only available for journals indexed in the Science Citation Index and Social Sciences Citation Index in the Web of Science Core Collection.**
- **Numerator can be inflated by items not counted in the denominator.**
- **Can be affected by self-citations or highly cited articles within the journal.**

Where to find it: Journal Impact Factor (JIF)



Final Thoughts: Journal Impact Factor (JIF)

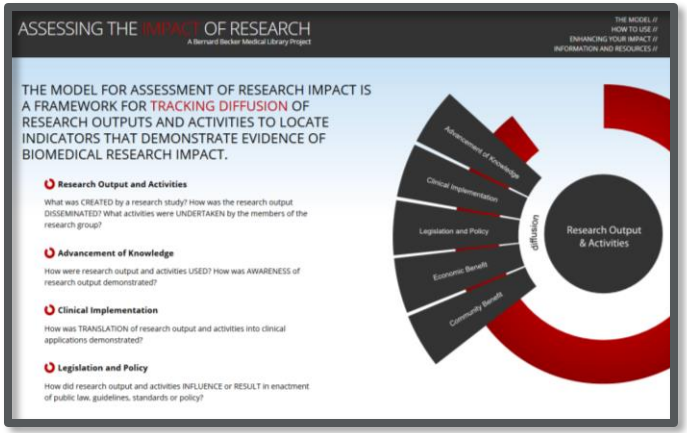
Metric statement: *The Lancet has a JIF of 60.39, which is the second highest journal impact factor of the 165 journals in the category of Medicine, General & Internal (InCites JCR). Of the 688 documents authored by Dr. Fauci that are indexed in Web of Science, 10 of them were published in The Lancet.*

What that means: *This means that documents published in The Lancet in the most recent two years should receive on average 60.4 citations in the most recent year.*

"The JIF was devised to measure the influence of journals but has been widely used to judge individual articles. This use is based on the specious assumption that all articles in a journal are equally influential, as reflected by their number of citations. This misuse can lead to weak articles being overvalued and important work being undervalued."

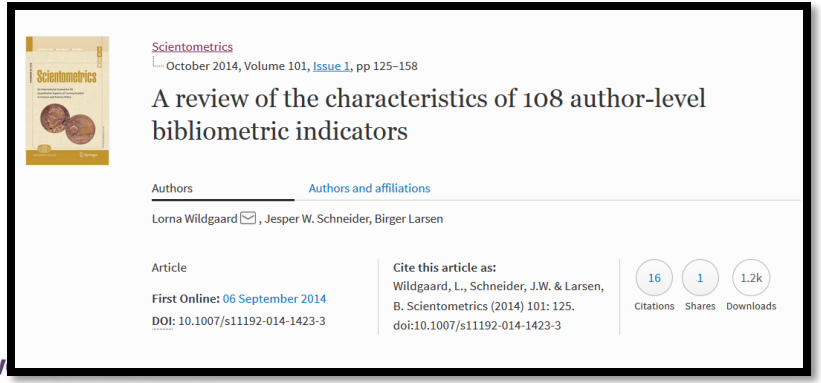
Reference: Surkis, Spore. "The Relative Citation Ratio: What Is It and Why Should Medical Librarians Care?" Journal of the Medical Library Association, vol. 106, no. 4, Medical Library Association, Oct. 2018, pp. 508–13, doi:10.5195/jmla.2018.499.

Building a library of metrics …



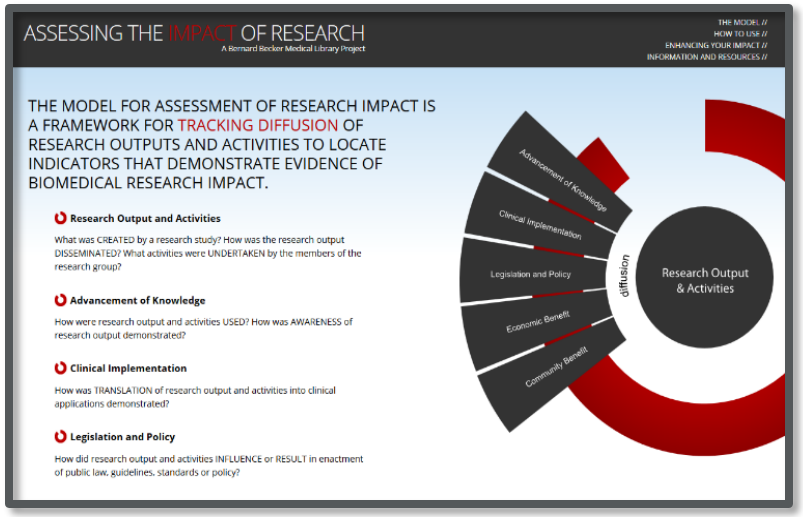
https://becker.wustl.edu/impact-assessment

http://www.rand.org/pubs/research_reports/RR1606.html



https://arxiv.org/abs/1408.5700

Helpful Frameworks for Research Impact



Becker Medical Library Model for Assessment of Research Impact

Advancement of Knowledge	
Books or Book Chapters	Book or book chapters generated by the research study is noted in a bibliography. Book is used as a textbook for higher education. Translations of the book. Book or book chapter cited in subsequent publications.
Change in Understanding and Awareness	Research study findings represent a paradigm shift in a field. Research study findings lead to change in understanding a problem.
Citations to Publications	Number of first generation citations. Number of second generation citations. Countries represented by citations. Institutions represented by citations. Languages represented by citations.

https://becker.wustl.edu/impact-assessment

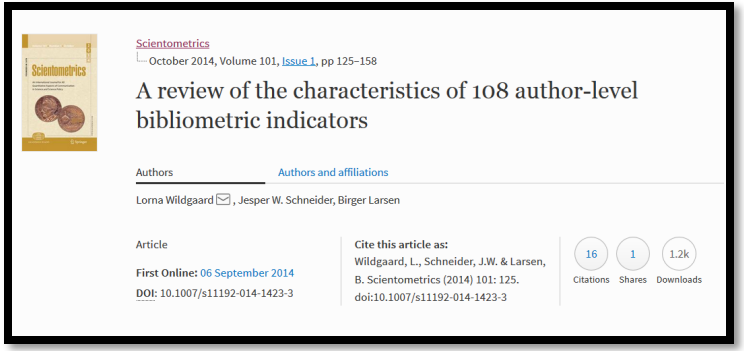
Helpful Frameworks for Research Impact

100 Metrics to Assess and Communicate the Value of Biomedical Research

Research Impacts	
Number of journal articles published	The number of peer-reviewed journal articles published over a particular timeframe is a quantitative metric of the volume of research produced by an individual or institution.
Number of citations	Measures of citations to published articles are used as a proxy for article quality. Can include Highly Cited Papers, Normalized Citation Score, etc.
Number of research output downloads	The number of times a research output has been downloaded gives an indication of how much it is being of use and the level of interest in it.
Mentions in Social Media	Information on who is citing the institution in social media can help identify where the influence of the medical school or teaching hospital is being felt across the sector, noting that this may be within academia.

http://www.rand.org/pubs/research_reports/RR1606.html

Helpful Frameworks for Research Impact



Scientometrics
October 2014, Volume 101, Issue 1, pp 125–158

A review of the characteristics of 108 author-level bibliometric indicators

Authors | Authors and affiliations

Lorna Wildgaard ✉, Jesper W. Schneider, Birger Larsen

Article

First Online: 06 September 2014
DOI: 10.1007/s11192-014-1423-3

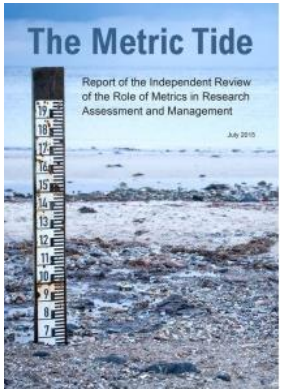
Cite this article as:
Wildgaard, L., Schneider, J.W. & Larsen, B. Scientometrics (2014) 101: 125. doi:10.1007/s11192-014-1423-3

16 Citations | 1 Shares | 1.2k Downloads

https://arxiv.org/abs/1408.5700

A review of the characteristics of 108 author-level bibliometric indicators

Indicators of publication count	
P (total publications)	Count of production used in formal communications
FA (first author counting)	Credit given to first author only
Co-authors	Indicates cooperation and growth of cooperation at inter- and national level
Noblesse Oblige (last author counting)	Indicates importance of the last author for the project behind the paper



Bibliometrics: The Leiden Manifesto for research metrics

Diana Hicks, Paul Wouters, Ludo Waltman, Sarah de Rijcke & Ismael Rafols

22 April 2015

Use these ten principles to guide research evaluation, urge Diana Hicks, Paul Wouters and colleagues.

Responsible Metrics Movement

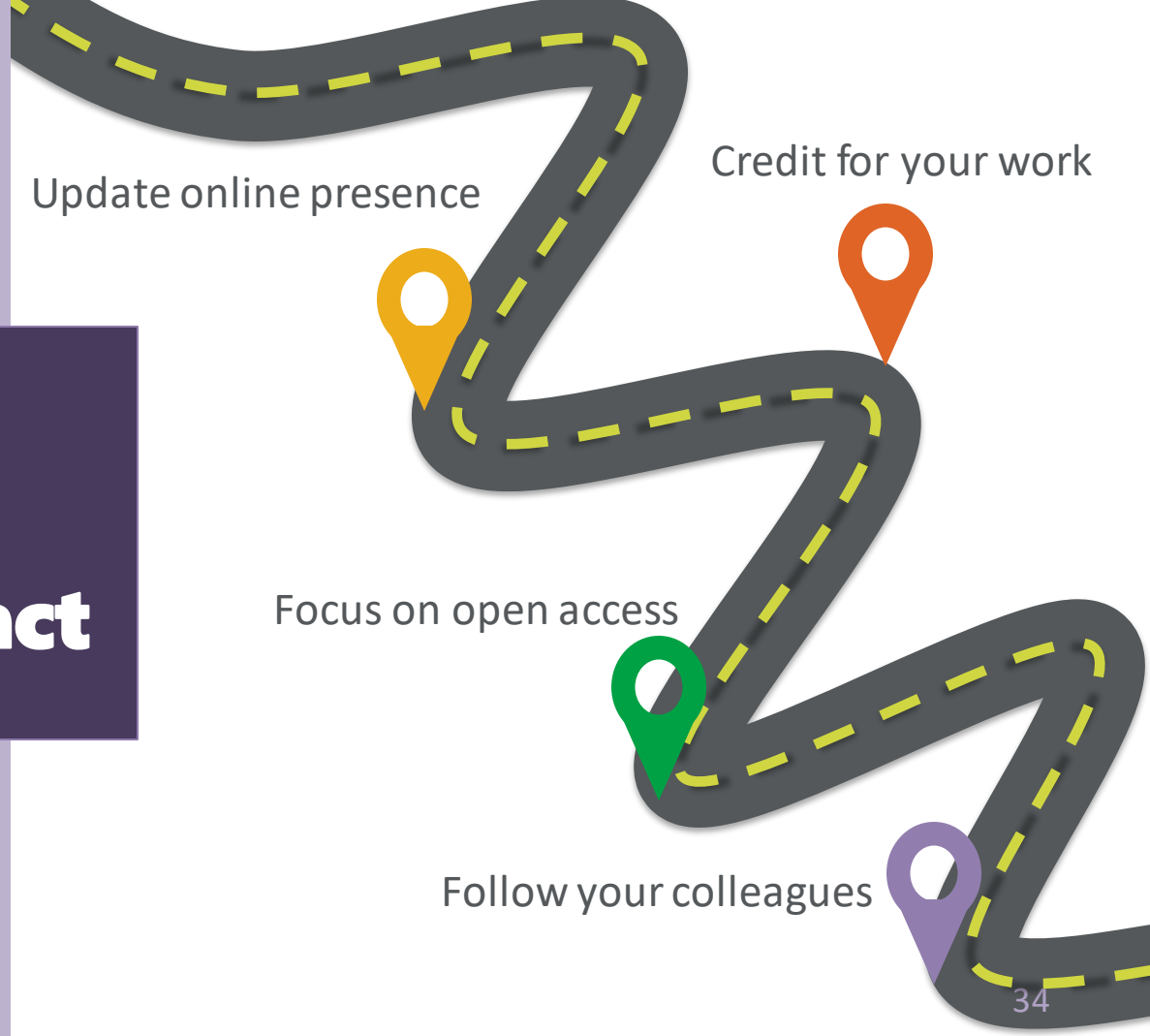
The **Declaration on Research Assessment** (DORA) is a initiative to improve the ways in which researchers and the outputs of scholarly research are evaluated (2012).

The **Metric Tide** is an independent review of the role of metrics in research assessment (2015).

The **Leiden Manifesto** is a list of ten principles to guide research evaluation (2015).

In addition, academic institutions and other organizations have written their own responsible metrics statements.
See: https://thebibliomagician.wordpress.com/statements-of-responsible-metrics-2/

Road map for enhancing Research Impact



Improve your online presence: update online profiles

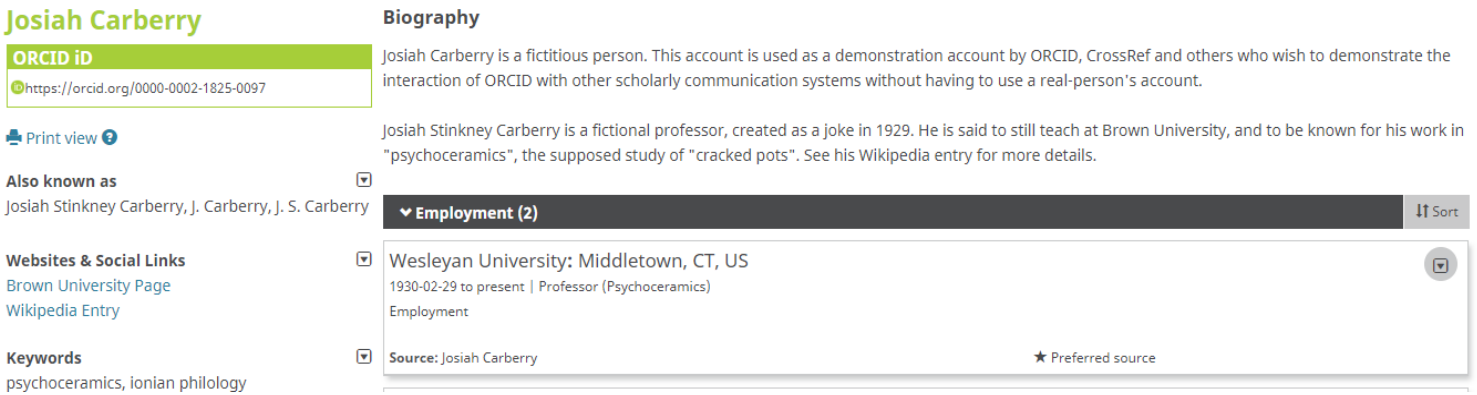
- **Northwestern Scholars** https://www.scholars.northwestern.edu/
- **FSM Faculty Profiles** http://www.feinberg.northwestern.edu/faculty-profiles/
- **ORCID** http://orcid.org/
- **Scopus Author ID** https:/www.edited/scopus/kw/author+ID/
- **Web of Science Researcher ID** http://www.researcherid.com
- **Google Scholar** https://scholar.google.com/
- **Linked In** https://www.linkedin.com/

Sign up for ORCID: Open Researcher and Contributor ID

Sign up for an ORCID and/or connect your ORCID to Northwestern systems:

https://orcid.it.northwestern.edu

See our ORCID Guide:
https://libguides.galter.northwestern.edu/orcid



Note, in the future you may be asked to sign into ORCID through some Northwestern systems.

Connect your ORCID ID

		Link to Resource	Link to Instructions
NU Systems	Northwestern ORCID App **	Resource	Instructions
	Northwestern Elements	Resource	Instructions
Abstracting & Indexing Databases	Scopus **	Resource	Instructions
	Web of Science **	Resource	Instructions
	Dimensions	Resource	Instructions
	MLA International Bibliography	Log into ORCID	Instructions
Data Aggregators	CrossRef	Log into ORCID	Instructions
	DataCite	Log into ORCID	Instructions
Generalist Repositories	Zenodo	Log into Zenodo	
	Figshare	Resource	Instructions
	Dryad	Resource	Instructions
Manuscript Submission Systems	ScholarOne	Log in during submission	Instructions
	Editorial Manager	Log in during submission	Instructions

Use your ORCID ID

Tips for using your ORCID iD and record:

- Use your ORCID iD if prompted during **manuscript submission** and **grant proposal submissions**.
- Link your ORCID iD to (or include it in your profile for) other services, including **ResearcherID, figshare**, and your professional organizations.
- Include your ORCID iD on **conference posters** (generate a QR code, if you like, right from your ORCID record page), to direct people to your works.
- Consider including your ORCID iD on your **webpage**, in **social media accounts**, and in your **email signature**.

Consider Open Access with DigitalHub

DigitalHub

https://digitalhub.northwestern.edu/

DigitalHub is an online repository for the scholarly output and research data of Feinberg School of Medicine

What can you upload to DigitalHub?

research papers
case reports
technical reports

figures
images
guidelines

datasets
summary statistics

books
newsletters
user guides

conference papers
abstracts
presentations

educational materials
workshop resources

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You can check publisher's open data policies using OAD:
http://oad.simmons.edu/oadwiki/Journal_open-data_policies

Copyright Basics Guide:
https://libguides.northwestern.edu/copyrightbasics

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Open Access Resources at Northwestern

Guide on Northwestern Support for OA Publishing

- https://libguides.galter.northwestern.edu/oapublishing/support

Northwestern OA Fund

- https://www.library.northwestern.edu/research/scholarly/open-access-fund.html

Wiley Hybrid Journal Agreement

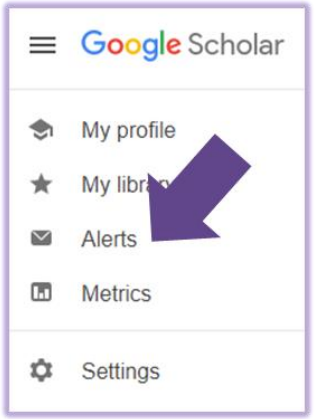
- **Wiley Journal Recommender System:** https://journalfinder.wiley.com/search?type=match

Directory of Open Access Journals

- http://www.doaj.org/

Curate your work: Set up alerts for your work

- Curate from Latin curare meaning "take care"
- Keep your profiles updated
- Set up alerts in:
  - Scopus
  - Web of Science
  - Google Scholar
  - Google



Useful Tools and Resources

Audience Choice for Demonstration

Metrics Toolkit

- **Description:** an online evidence-based resource for navigating the research metrics landscape
- **Available at**: https://www.metrics-toolkit.org/

ImpactStory

- **Description:** an aggregator of alternative metrics that focuses on building personal profiles to illustrate research impact.
- **Available at**: https://profiles.impactstory.org/search

Grow Kudos

- **Description**: an online tool to increase readership through lay summaries and track readership and views
- **Available at:** https://www.growkudos.com/

Altmetric Bookmarklet

Description: an aggregator of alternative metrics that focuses on individual articles and provides an overall score
Available at: https://www.altmetric.com/products/free-tools/bookmarklet/

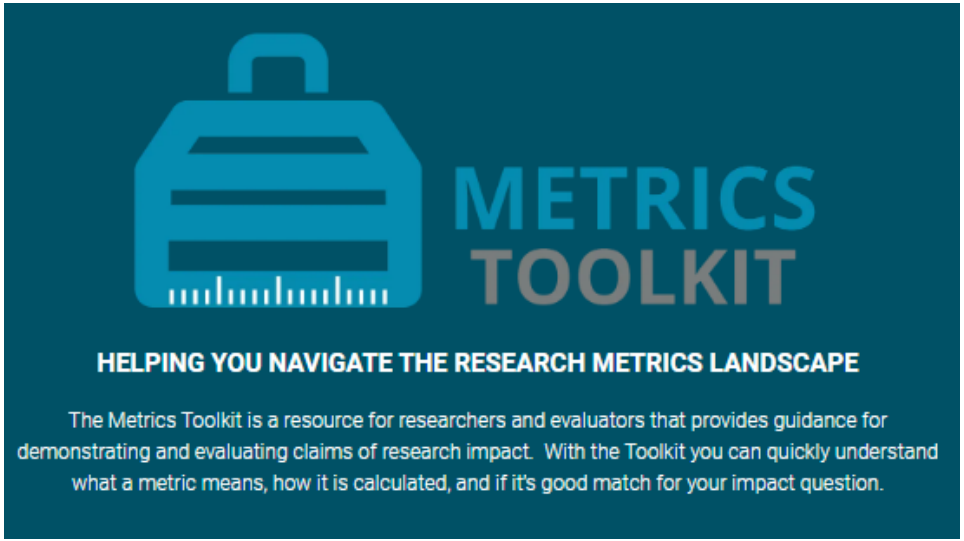
Scite Browser Extension

- **Description:** a browser extensions that shows how a research article is supported, contrasted, or mentioned
- **Available at:** https://scite.ai/extension-install

Author and Citation Alerts in:

- **Scopus**
- **Web of Science**

Metrics Toolkit



Available at: https://www.metrics-toolkit.org/

Metrics Toolkit (continued)

Check out: Blog mentions
Available at: https://www.metrics-toolkit.org/metrics/blog_mentions/

Blog mentions

Field	Field Value
Name	Blog Mentions
Can Apply To	Primarily articles, books, and other scholarly items with persistent identifiers, such as a DOI, Pubmed ID, or Handle
Metric Definition	The number of times a scholarly output has been linked to from a blog.
Metric Calculation	Blog mentions are comprised of raw counts of links to outputs, from blogs. Some services track links only for items with a persistent identifier.
Data Sources	Links from both scholarly and general interest blogs are tracked, though coverage varies between altmetrics services.
Appropriate Use Cases	Discussions on blogs have been found to have a slight correlation to later citations. They are not a sure-fire indicator for later citations. Use blog mentions only to learn what other researchers or members of the public are saying about a piece of research. The number of blog mentions is less important than what is being said.
Limitations	Given their unvetted nature, it is risky to assume that a link to a piece of research from any blog–even a scholarly one–constitutes quality criticism.
Inappropriate Use Cases	Blog mentions should not be interpreted as a direct measure of quality or impact, even amongst researcher blog networks.
Available Metric Sources	Altmetric, PlumX, Impactstory Profiles, CrossRef Event Data (for items with DOIs, on Wordpress.com-hosted blogs)
Transparency	In all altmetrics services in which blog mentions are available, one can access the full-text of the blog mentions, making this a relatively transparent metric. However, no altmetrics service makes their full list of blogs tracked available.
Website	n/a
Timeframe	Altmetric began tracking blog mentions in October 2011 (meaning Impactstory Profiles coverage spans this time frame, as well). PlumX does not share information on its coverage dates for blog mentions.

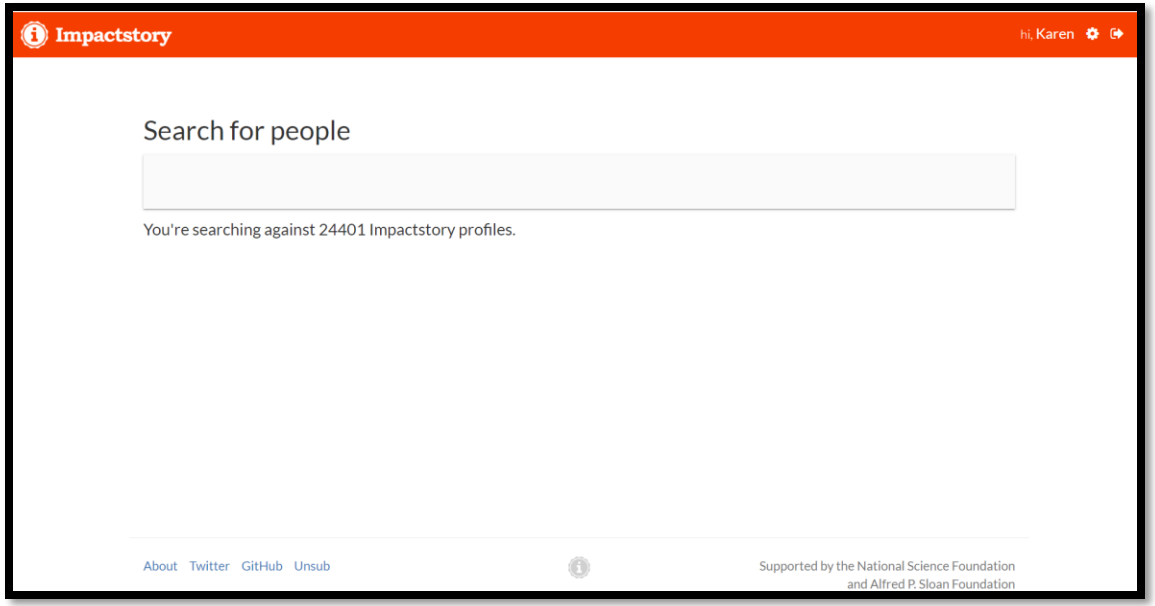
Updated on 10 Aug 2020

Metrics Toolkit

Quiz Questions

1. What are three sources where you can find the h-index?
2. What metric is considered the most appropriate means of comparison between journal articles or groups of journal articles because it is field normalized and is less prone skew from outliers, such as a few highly cited publications?
3. What metric primarily applies to software and code?
4. Which metric is a field-normalized indicator of influence, used by the NIH for evaluating the relative merits of biomedical research articles?
5. Other than Google Data, what is another possible location for finding counts of data citations?
6. Article Citations are a measure of:
   a) research quality
   b) influence amongst other scholars
   c) positive reputation for a researcher
   d) comparison between papers

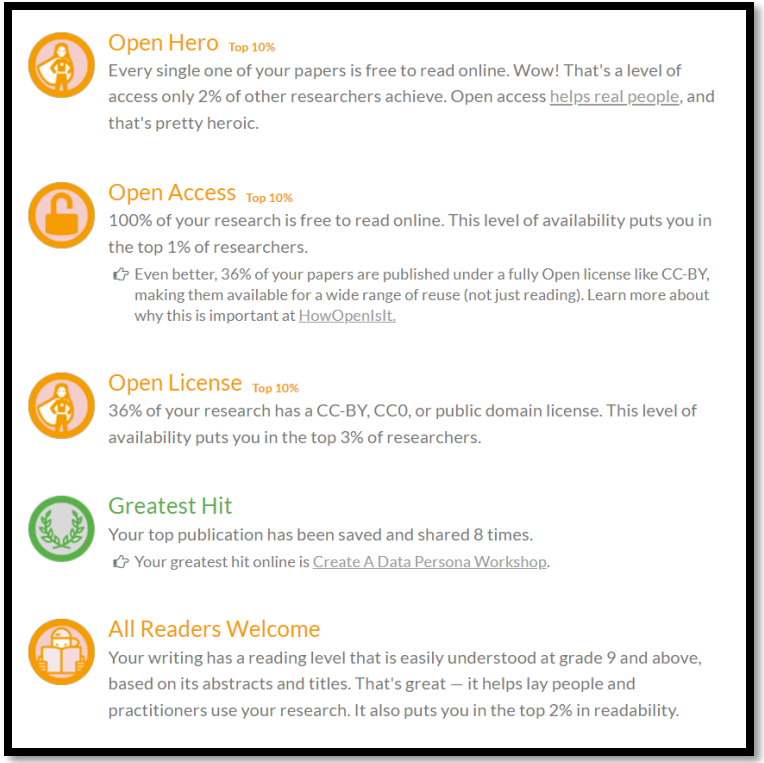
Impactstory



Available at: https://profiles.impactstory.org/search

Impactstory (continued)

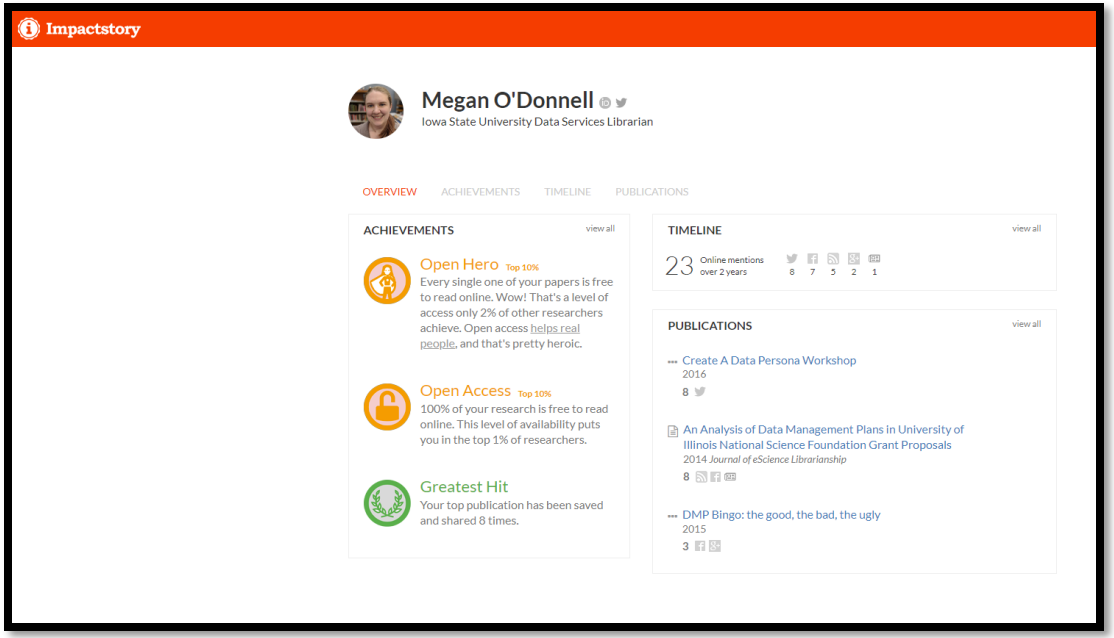
- **All Readers Welcome**: reading level of abstracts and titles
- **Big in Japan**: Work has been saved or shared by someone in Japan
- **Global Reach**: Number of countries to research has been saved and shared in
- **Global South**: percent of people from the Global South who save and share research (including Brazil, Ukraine, China, etc.).
- **Greatest Hit**: top publication based on saves and shares
- **Open Access**: percent of research free to read online
- **Open Hero**: every paper is free to read online
- **Open License:** percent of research with a CC-BY, CC0, or public domain license
- **Wikitastic:** Research is mentioned in Wikipedia articles



Impactstory (continued)

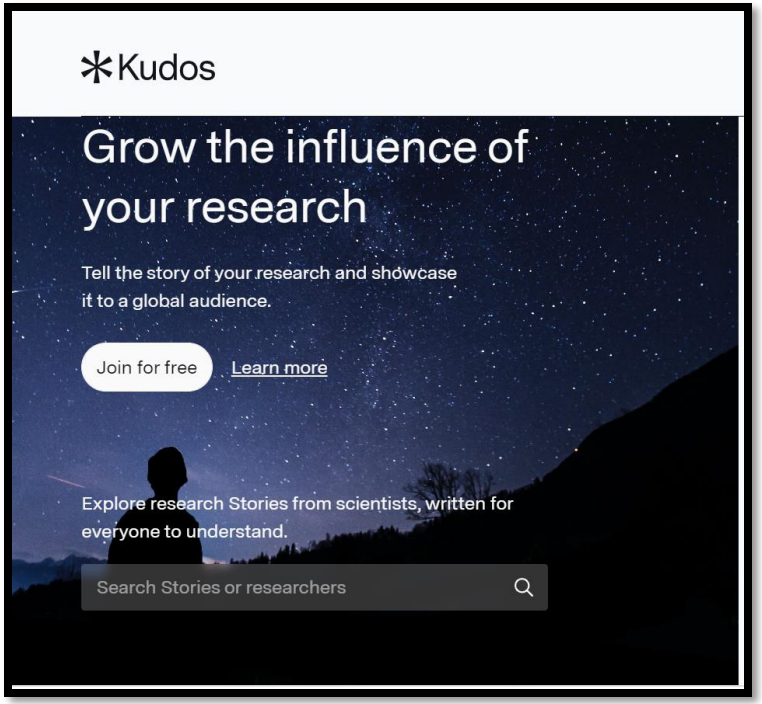
Check out some profiles:

- Megan O'Donnell: https://profiles.impactstory.org/u/0000-0002-4632-6642
- Pedro Silva: https://profiles.impactstory.org/u/0000-0001-9316-9275
- Heather Piwowar: https://profiles.impactstory.org/u/0000-0003-1613-5981
- Stacy Konkiel: https://profiles.impactstory.org/u/0000-0002-0546-8257
- Robert Terry: https://profiles.impactstory.org/u/0000-0003-3849-7705



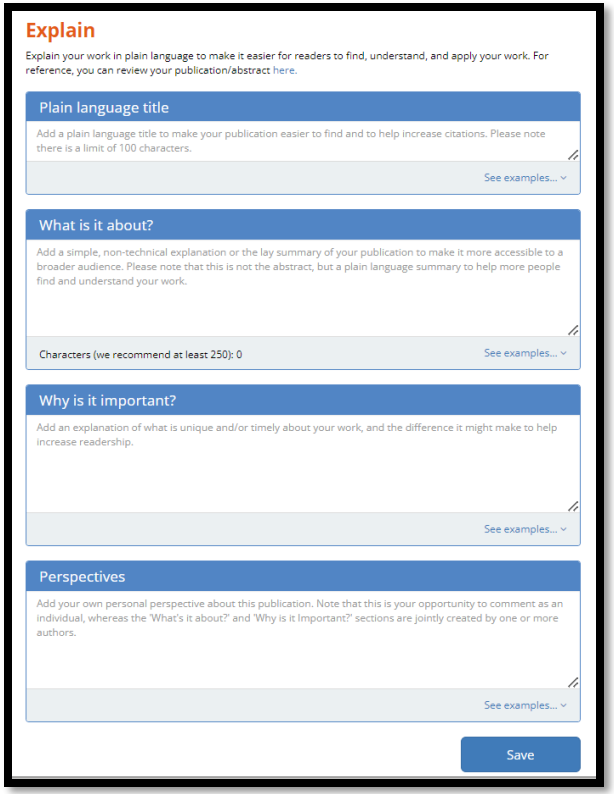
Search more profiles here: https://profiles.impactstory.org/search

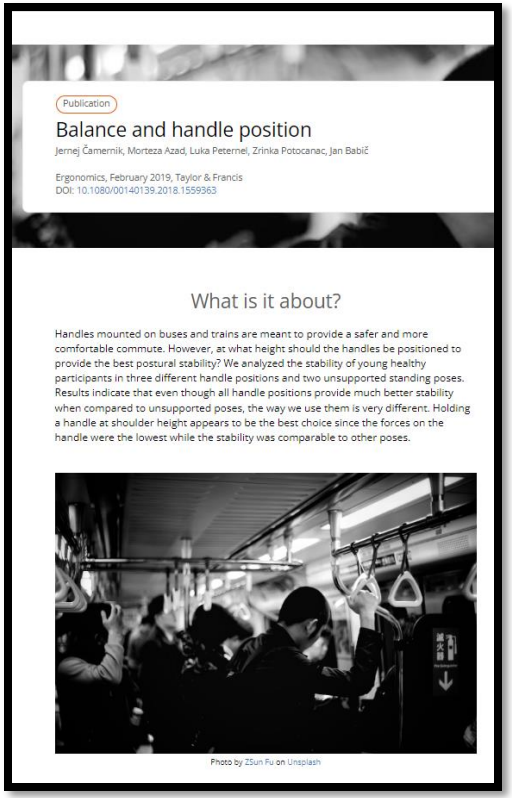
Kudos



Available at: https://www.growkudos.com/

Kudos (continued)



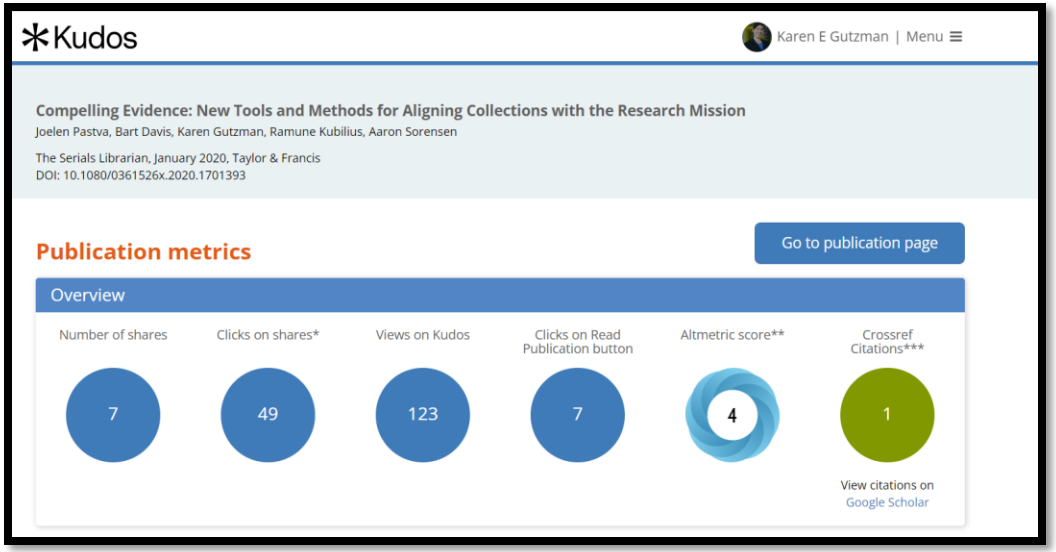


Check out the Kudos Research Showcase: https://www.growkudos.com/showcase/

Some examples to review:

- https://www.growkudos.com/publications/10.1073%25252Fpnas.2213418120/reader
- https://www.growkudos.com/publications/10.1017%25252Fs1355770x2000056x/reader

Kudos (continued)

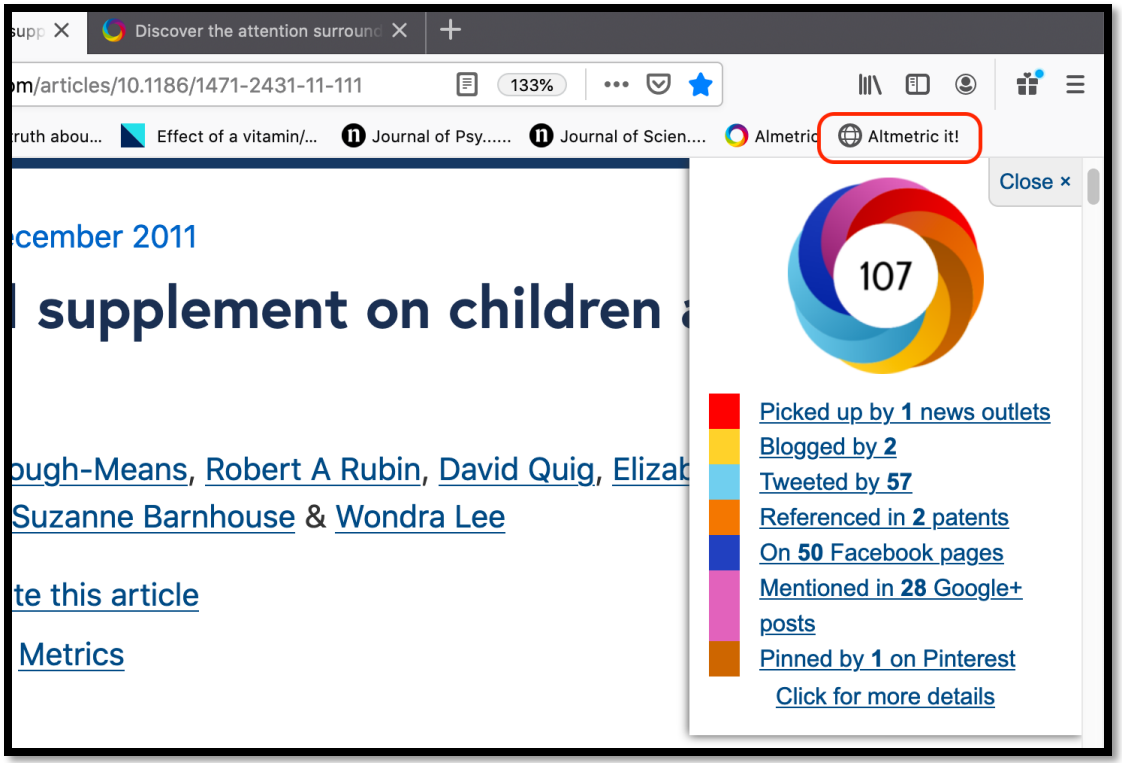


Altmetric Bookmarklet

1. Add bookmarklet to your bookmarks toolbar
2. Visit any paper
3. Get article level metrics with a single click

Available at: https://www.altmetric.com/products/free-tools/bookmarklet/

Altmetric Bookmarklet (continued)



Altmetric Bookmarklet (continued

The Colors of the Donut

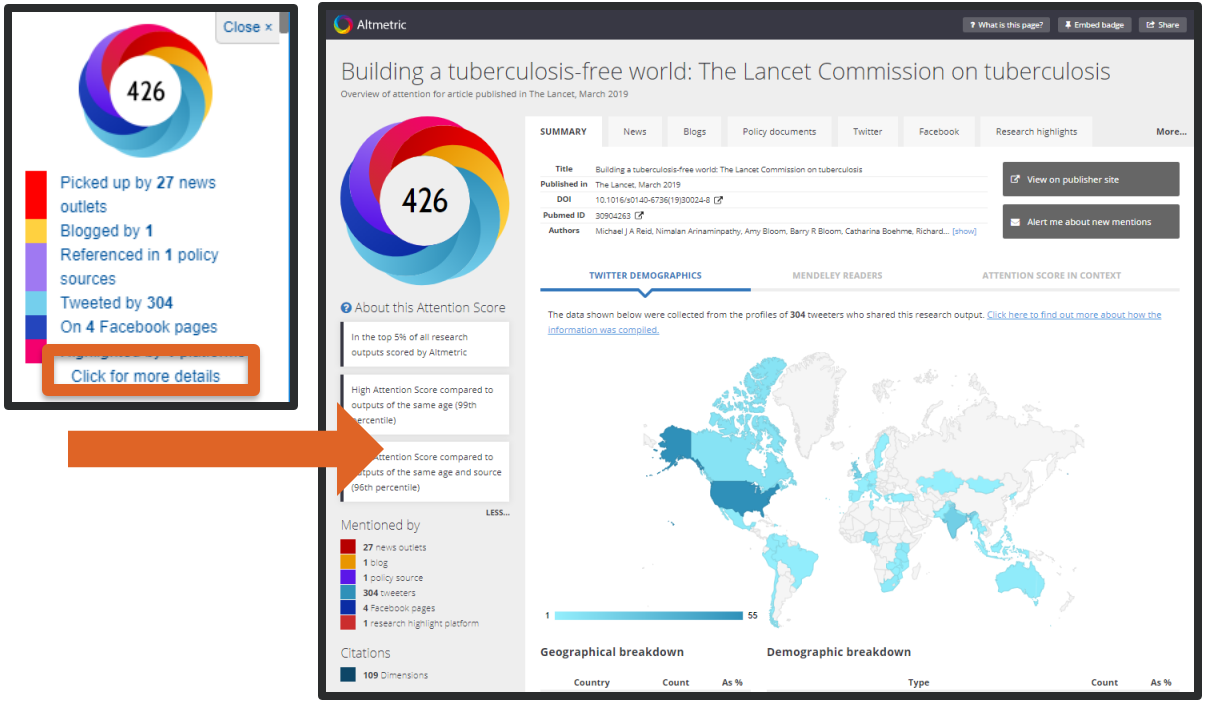
- Policy documents
- News
- Blogs
- Twitter
- Post-publication peer-reviews
- Facebook
- Sina Weibo
- Syllabi
- Wikipedia
- Google+
- LinkedIn
- Reddit
- Research highlight platform
- Q&A (Stack Overflow)
- Youtube
- Pinterest
- Patents

Example of a Altmetric Donut & Attention Score:

The Scoring of Sources

News	8
Blog	5
Policy document (per source)	3
Patent	3
Wikipedia	3
Peer review (Publons, Pubpeer)	1
Weibo (not trackable since 2015, but historical data kept)	1
Google+ (not trackable since 2019, but historical data kept)	1
F1000	1
Syllabi (Open Syllabus)	1
LinkedIn (not trackable since 2014, but historical data kept)	0.5
Twitter (tweets and retweets)	0.25
Facebook (only a curated list of public Pages)	0.25
Reddit	0.25
Pinterest (not trackable since 2013, but historical data kept)	0.25
Q&A (Stack Exchan)	0.25
Youtube	0.25
Number of Mendeley readers	0
Number of Dimensions and Web of Science citations	0

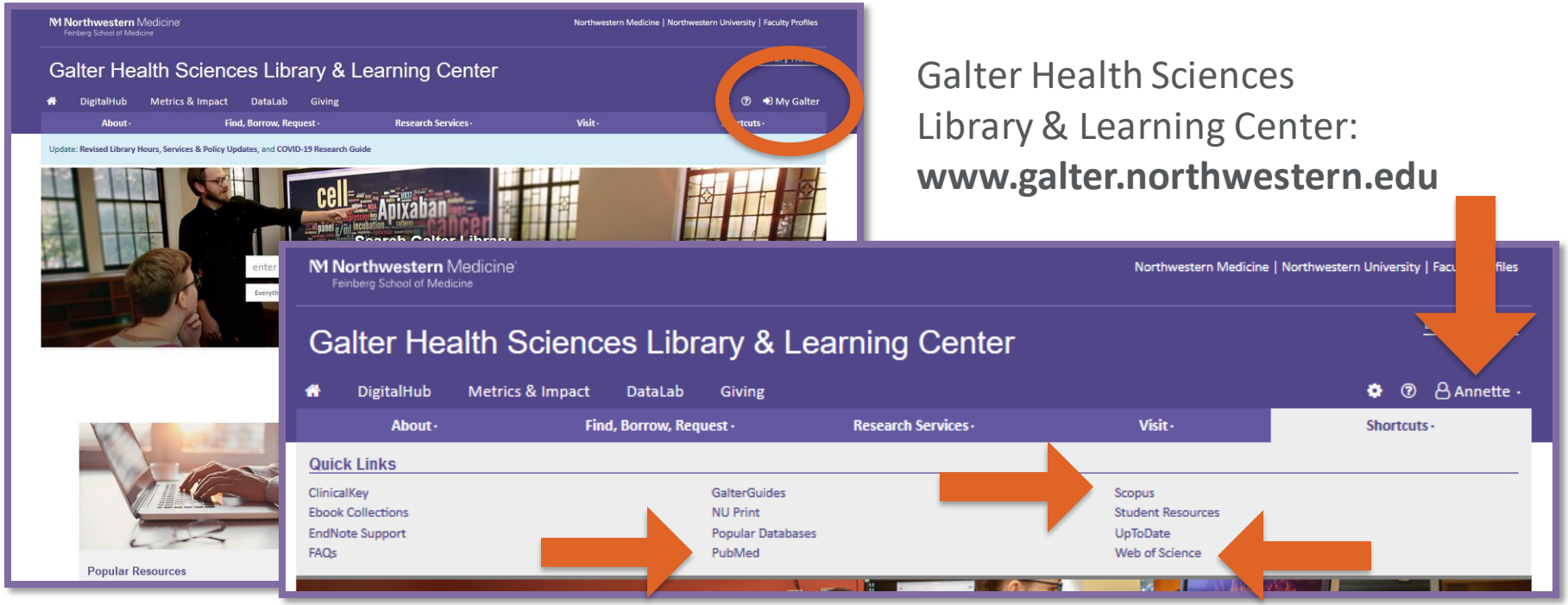
Altmetric Bookmarklet (continued)



Check out some Altmetric Attention Scores:

- https://doi.org/10.1038/s41562-020-0884-z
- https://doi.org/10.1542/peds.2020-016824
- https://doi.org/10.1016/j.ekir.2020.09.015
- https://doi.org/10.1098/rsif.2020.0686
- https://doi.org/10.1016/j.matt.2019.12.002

Getting to Scopus, Web of Science and PubMed

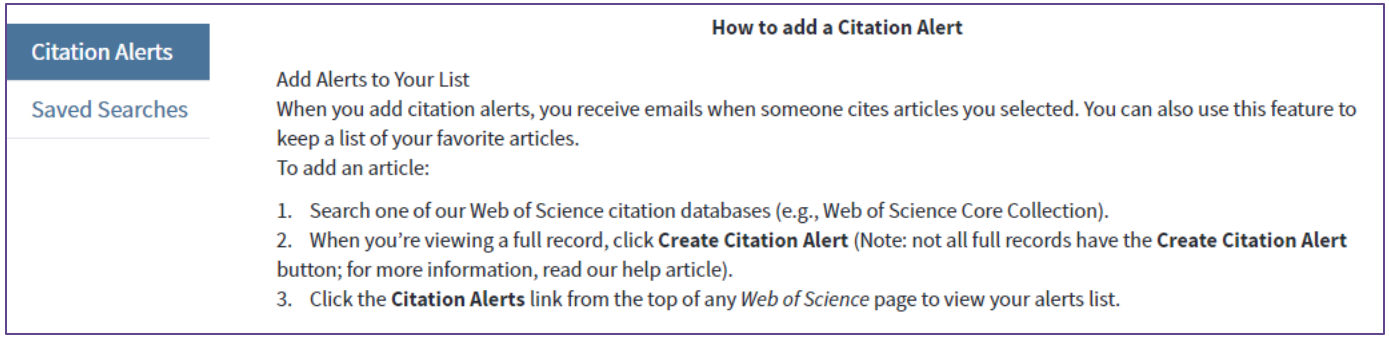


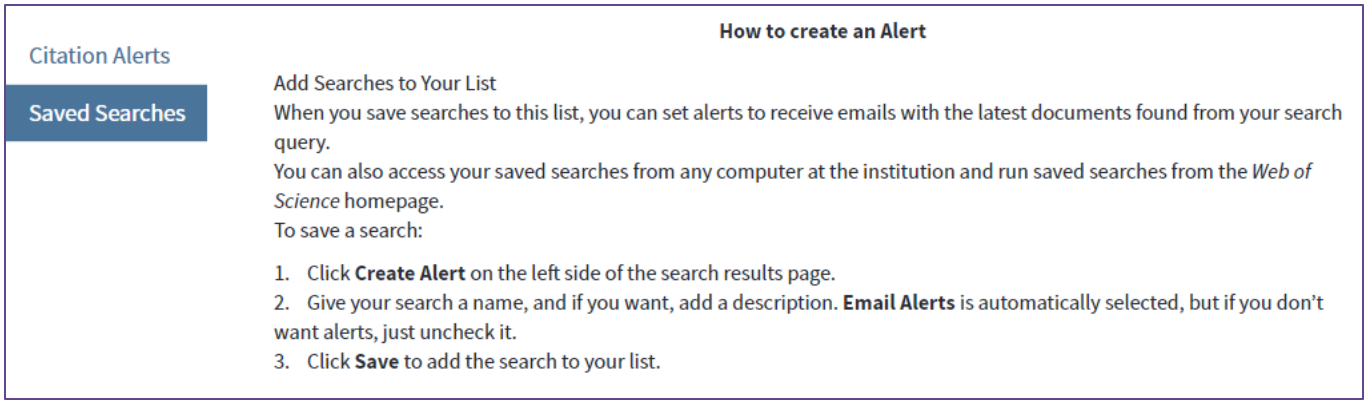
Galter Health Sciences Library & Learning Center: **www.galter.northwestern.edu**

To learn more about accessing resources at Galter Library visit the Online Resource Access page on the Library Services FAQs libguide.

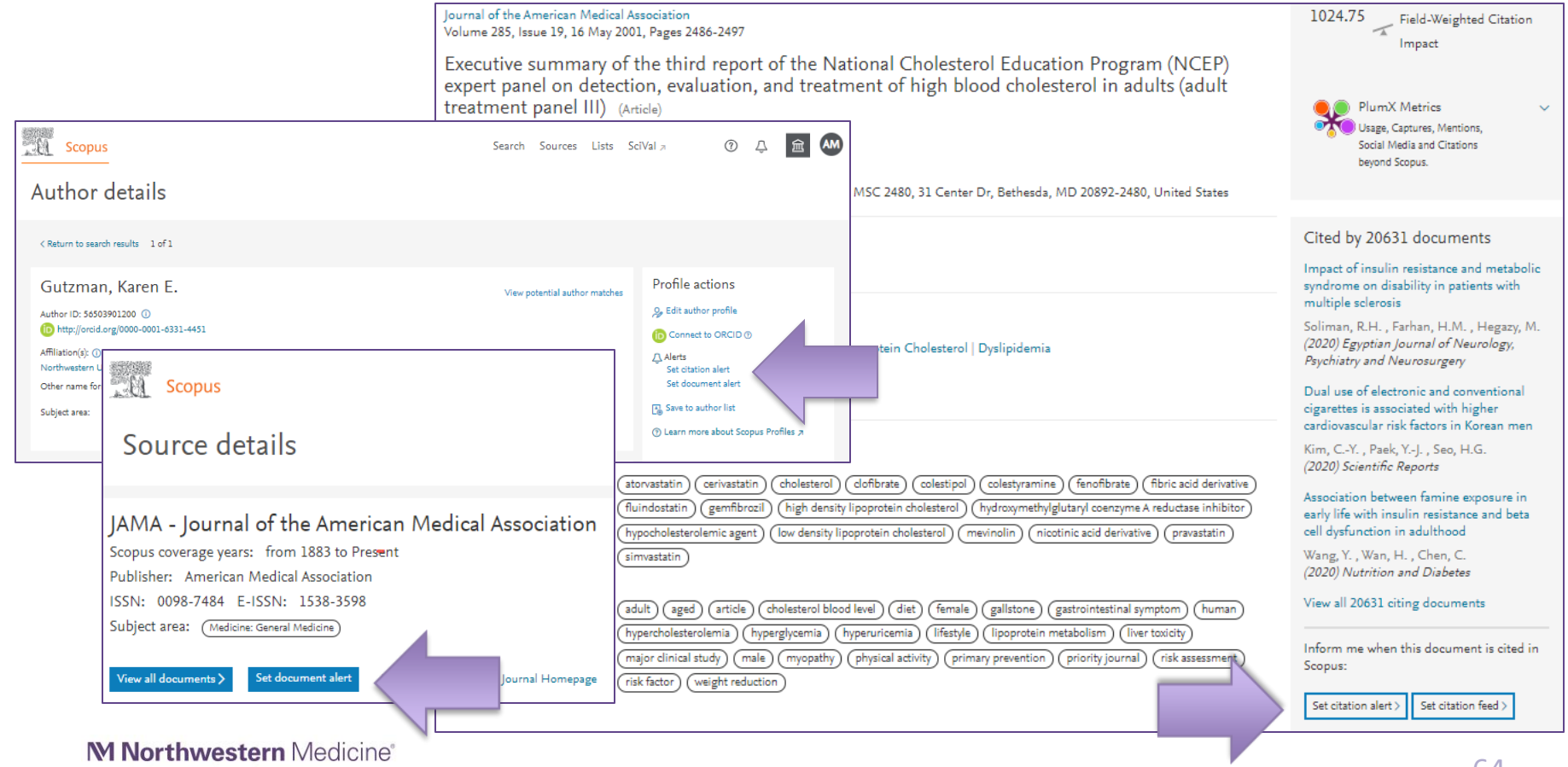
Web of Science Author and Citation Alerts

- Web of Science

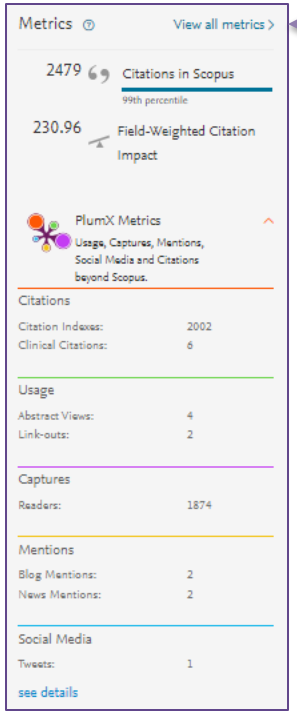


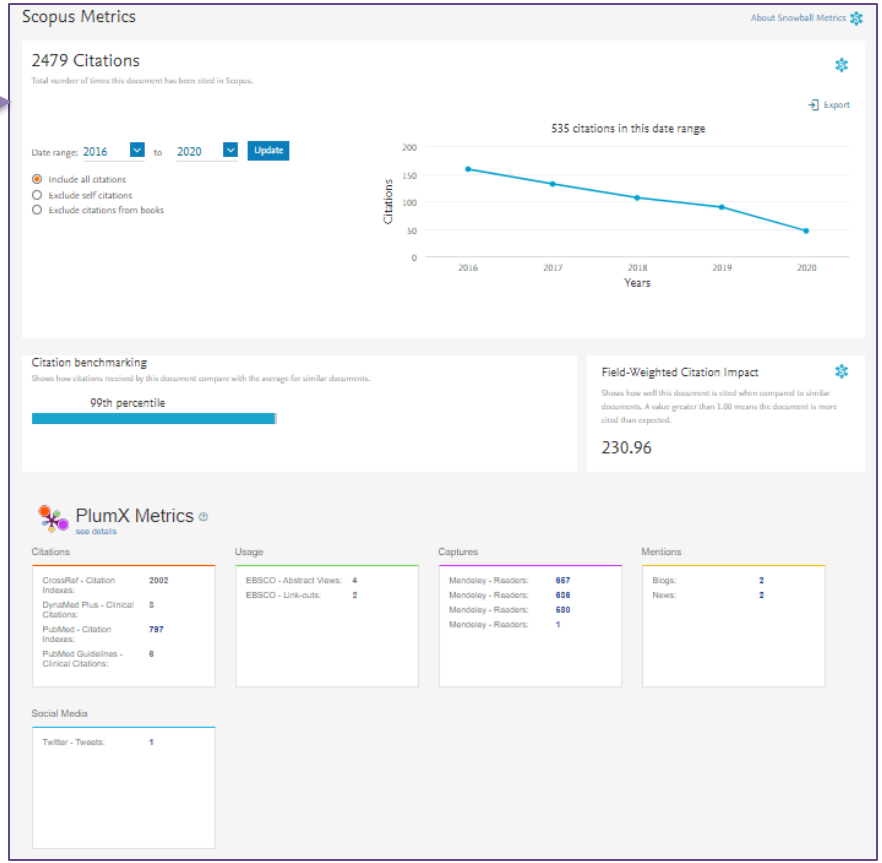


Scopus Author and Citation Alerts

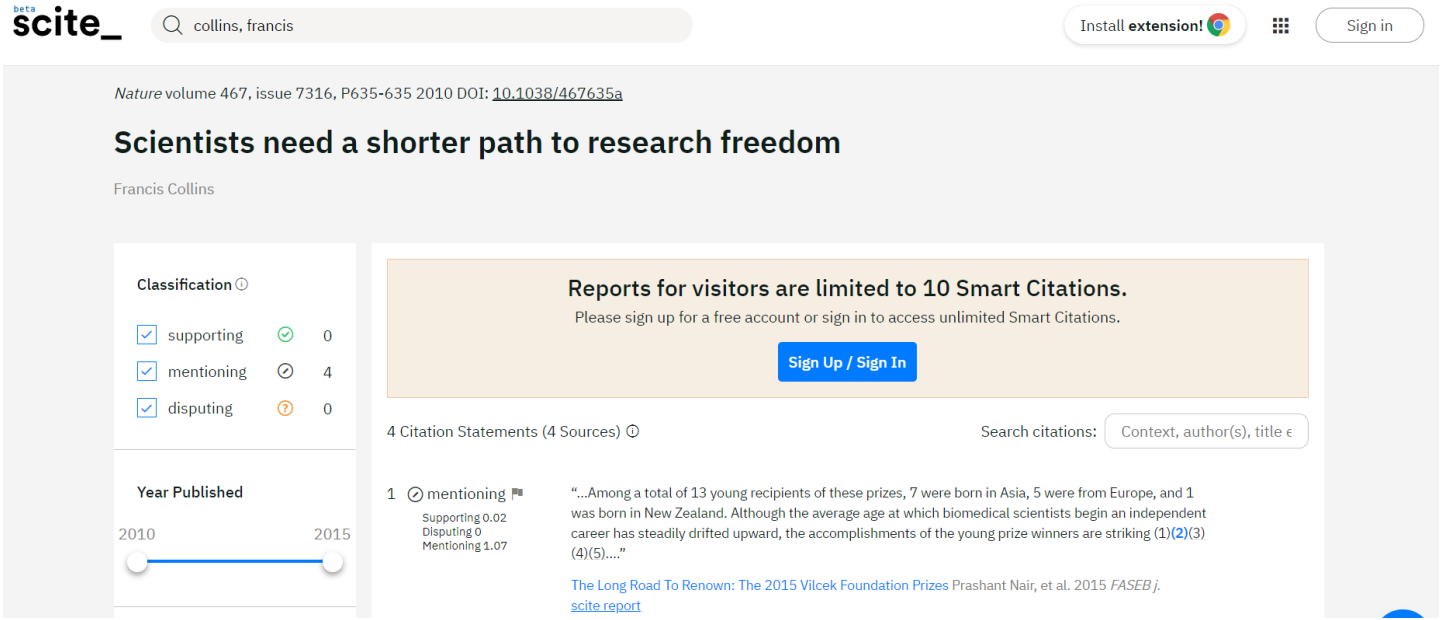


Scopus Metrics





Scite Browser Extension



Available at: https://scite.ai/extension-install

Scite Browser Extension (continued)

Things to know:

- Citations are classified by a deep learning model that is trained to identify three categories of citation statements: those that provide contrasting or supporting *evidence* for the cited work, and others, which mention the cited study without providing evidence for its validity.
- Citations that simply use the same method, reagent, or software are not classified as supporting.
- Cited by counts come from full-text article indexed through publisher agreements. Often lower than expected!
- The browser extension currently supports Wikipedia, Pubmed, Pubmed Central, ScienceDirect, eLife, Nature, Google, Google Scholar, PLOS, ORCID, AGS, Springer, MDPI, Sage, Taylor & Francis Online, SPIE, Wiley, Karger biorxiv, medrxiv, Science, Web of Science, Scopus. PNAS and Europe PMC, IOP, fsg, frontiers, IUCr, Thieme, Cambridge University Press, Rockefeller University Press, etc.

Scite Browser Extension (continued)

Review some examples of Scite Browser Extension:

- https://pubmed.ncbi.nlm.nih.gov/30177761/
- https://pubmed.ncbi.nlm.nih.gov/30429354/
- https://pubmed.ncbi.nlm.nih.gov/30379613/
- https://pubmed.ncbi.nlm.nih.gov/29299598/
- https://pubmed.ncbi.nlm.nih.gov/34040097/

*Note In interpreting citation statements - the **black bold text** is the metadata of the citing publication. The **blue text** is the citation to the cited publication.*

Scite Question/Answer Mode:

- https://scite.ai/search?mode=question-answering
- Sample Questions:
  - What are myths about antibiotic resistance?
  - What are the biggest sources of air pollution?
  - Do strengthening interventions increase strength in people who are suffering the effects of acute and chronic stroke?
  - Is the Mapleson C circuit more effective than the Laerdal circuit in removing secretions and improving ventilation and gas exchange during manual hyperinflation?

VosViewer

- VOSviewer is a software tool for constructing and visualizing bibliometric networks. These networks may for instance include journals, researchers, or individual publications, and they can be constructed based on citation, bibliographic coupling, co-citation, or co-authorship relations. VOSviewer also offers text mining functionality that can be used to construct and visualize co-occurrence networks of important terms extracted from a body of scientific literature.
- Download at: https://www.vosviewer.com/

VosViewer

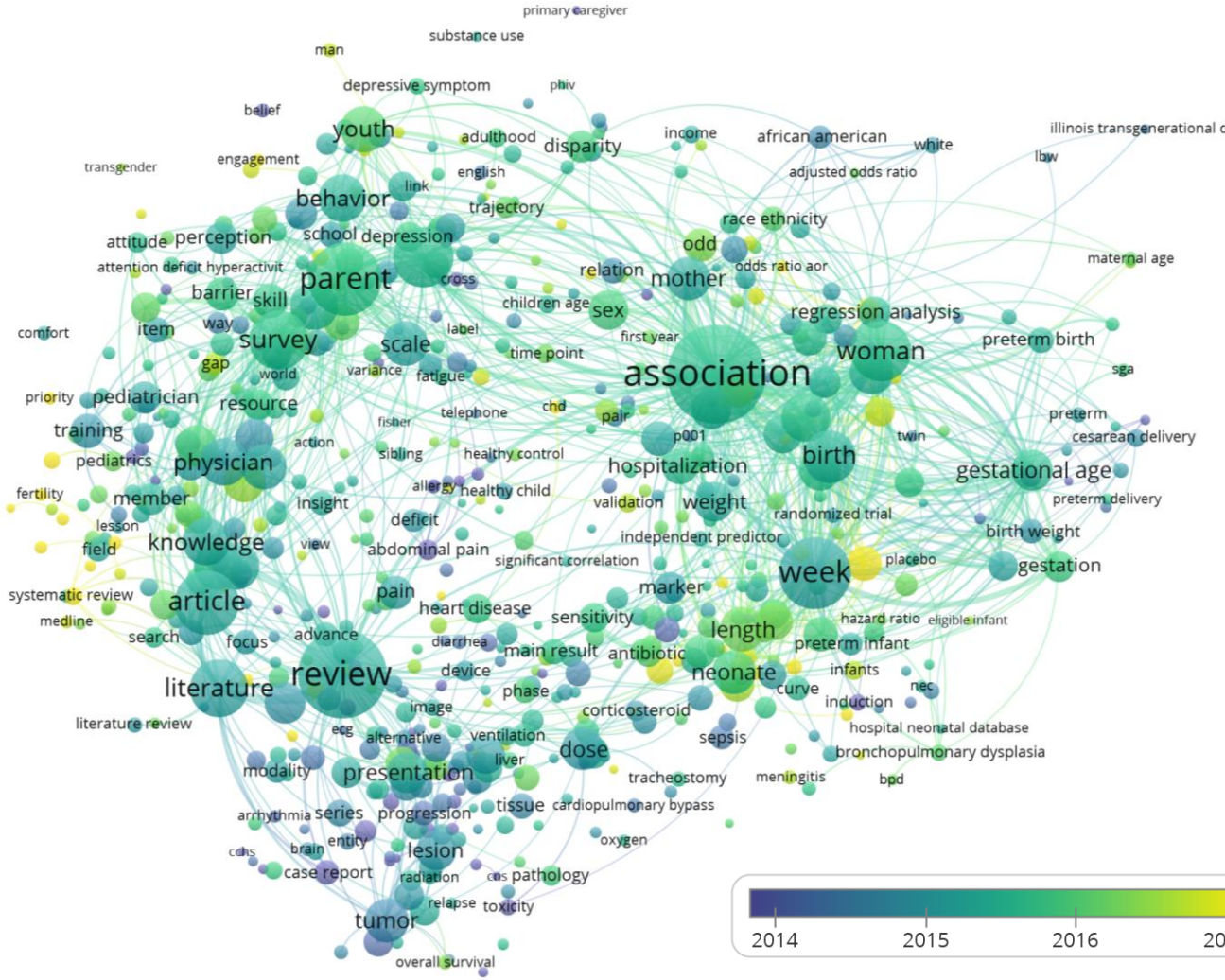
- A quick search and export in Scopus for the subject area of Pediatrics (applied at the journal-level) and Northwestern affiliation, limit to final publications, articles, reviews, and 2010-2019:

```
SUBJTERMS ( 2735 ) AND ( AF-ID ( "Northwestern University" 60007363 ) OR AF-ID ( "Northwestern University Feinberg School of Medicine" 60013227 ) OR AF-ID ( "Rehabilitation Institute of Chicago" 60001590 ) OR AF-ID ( "McGaw Medical Center of Northwestern University" 60006203 ) OR AF-ID ( "Ann & Robert H. Lurie Children's Hospital of Chicago" 60017031 ) ) AND ( LIMIT-TO ( PUBSTAGE , "final" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE , "re" ) ) AND ( LIMIT-TO ( PUBYEAR , 2019 ) OR LIMIT-TO ( PUBYEAR , 2018 ) OR LIMIT-TO ( PUBYEAR , 2017 ) OR LIMIT-TO ( PUBYEAR , 2016 ) OR LIMIT-TO ( PUBYEAR , 2015 ) OR LIMIT-TO ( PUBYEAR , 2014 ) OR LIMIT-TO ( PUBYEAR , 2013 ) OR LIMIT-TO ( PUBYEAR , 2012 ) OR LIMIT-TO ( PUBYEAR , 2011 ) OR LIMIT-TO ( PUBYEAR , 2010 ) )
```

- In VosViewer, consider creating a term co-occurrence map using the overlay visualization with scores by average publication to view topical trends over time.

VosViewer

See video here:
https://www.youtube.com/watch?v=KQdlSbTacok



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Acknowledgements:

The following people are instrumental in developing research impact and dissemination materials and training, and from whose guidance we have greatly benefited.

Kristi Holmes
Galter Health Sciences Library & Learning Center, Northwestern University

Cathy Sarli
Becker Medical Library, Washington University in St. Louis

Patty Smith
Previously at Galter Library, Northwestern University, now at Altmetric.com

Amy Suiter
Becker Medical Library, Washington University in St. Louis

Annette Mendoza
Previously at Galter Library, Northwestern University, now at Lurie Children's Hospital

Thank You

What is the purpose of research evaluation?

Advocacy

Making the case for research

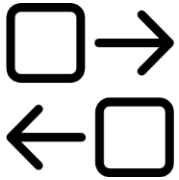
Analysis

Understanding what works

Accountability

…to taxpayers and donors

Allocation



Rewarding impact

Guthrie S, Wamae W, Diepeveen S, Wooding S, Grant J. Measuring research. 2013. http://www.rand.org/pubs/monographs/MG1217.html.

Example of Program or Project Evaluation

Inputs

What resources are being used?

Inputs include funding, staff, key partners, knowledge and expertise, policies, infrastructure, etc.

Input indicators include reports on budgets, requisition orders, curriculum vitas, reference letters.

Activities

What activities do we do with these resources?

Activities may include meetings, presentations, conducting research, etc.

Activity indicators may include who and where the activities took place and what were the goals of the activities.

Outputs

What outputs are produced?

Outputs may include publications, presentations, policy documents, white papers, datasets, etc.

Output indicators may describe the quality and quantity of outputs, and any context necessary.

Immediate Outcomes

What outcomes do they create?

Outcomes are immediate effects and should include real world changes the outputs may produce.

Outcome indicators may include the number of people and nature of the benefits, changes in perception or experiences, etc.

Long-term Outcomes

What long-term outcomes are realized

Long-term outcomes are often similar to mission statements and are rarely attributable to one person, program, or project.

Impact Indicators

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Bibliometric Websites

- Altmetrics

- New way to measure engagement with research outputs
- Data that explain both the volume and nature of attention research has received on line
- Provides evidence of engagement with diverse audiences and potential impact

- Can measure how many people have shared or engaged with a scholarly output online (Twitter, news outlets, Wikipedia citations, post-publication peer review, citations in policy documents)
- Complementary to bibliometrics (citation-based)

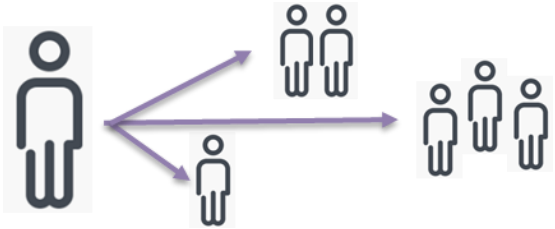
Bibliometric Websites

- Altmetrics

Resources

Real time information

Reach new audiences



Track various kinds of output

Advantages