Northwestern Medicine®
Feinberg School of Medicine

All About Metrics:

A review of research impact metrics and how to use them

Annette Mendoza, MLIS
Karen Gutzman, MSLS, MA
Galter Health Sciences Library & Learning Center
Research Assessment and Communications

All About Metrics:

A review of research impact metrics and how to use them

Course Description: This 45 minute course will provide information on the most common research evaluation metrics. There will also be discussion around metrics in action, the responsible use of metrics, and examples on how to include metrics in your impact statements.

Course Outcomes: At the end of the course, the attendee will:

- Become familiar with the most metrics used in research impact.
- Understand the concept of responsible metrics.
- Be able to create descriptive statements that include metrics.
- Become aware of the metrics services available to them through Galter Library.

User Services

Digital Systems

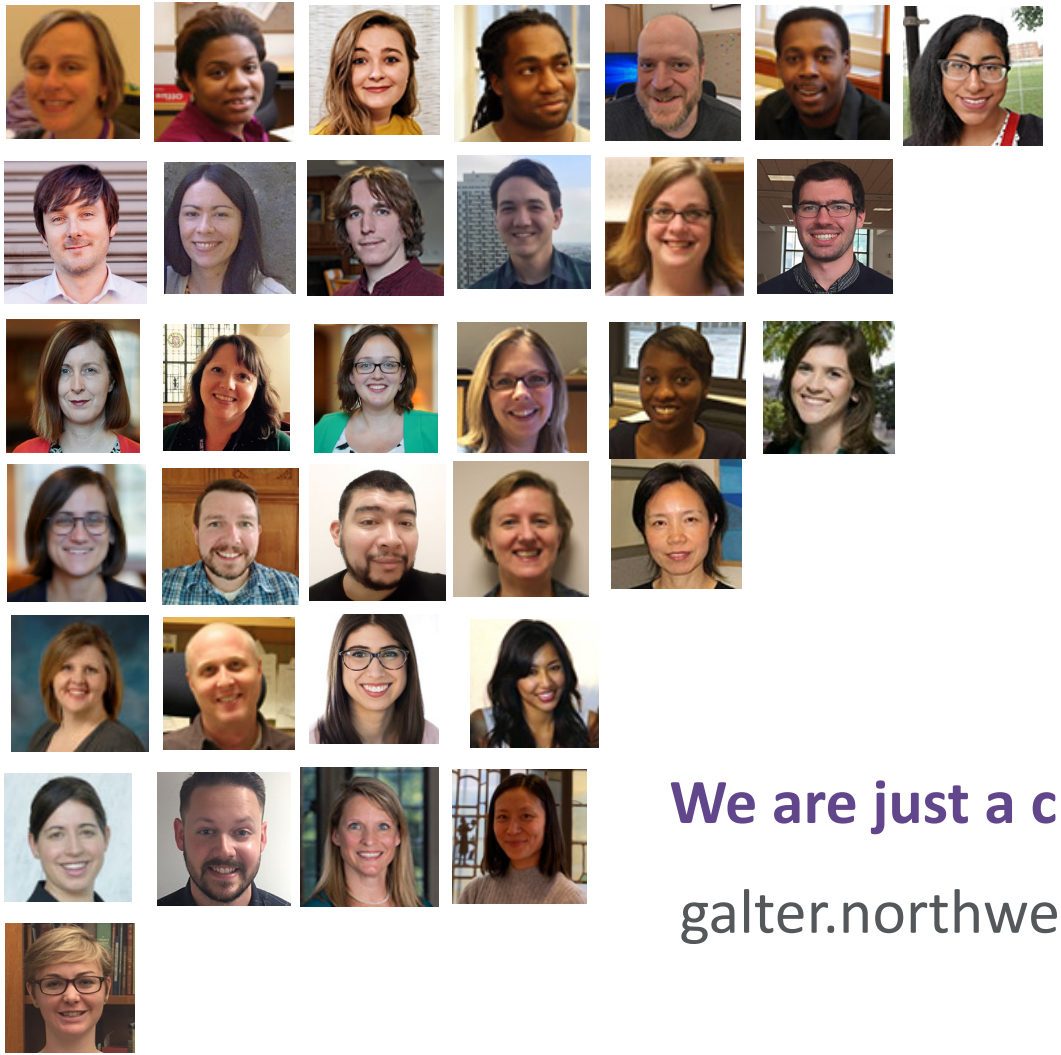
Research and Information Services

Collection Management and Metadata Services

Administration

Research Assessment and Communications

Special Collections



We are just a click away.

galter.northwestern.edu

Photo by Jacob Lund from Noun Project

Metrics can be used to identify:

research productivity
innovative or impactful research
quality of research communication
collaboration between individuals or groups
engagement with various audiences
advancement of knowledge
health or policy impacts
scientific potential
career prestige
and more. . .

How can Galter Library help?

Where possible, we want to help our faculty **choose metrics cautiously** and to inform users of bibliometric metrics **about their correct interpretation** and where necessary **about their limitations**.

Reference: Glänzel, Thijs. “Productivity, Performance, Efficiency, impact—What Do We Measure Anyway?: Some Comments on the Paper ‘A Farewell to the MNCS and Like Size-Independent Indicators’ by Abramo and D’Angelo.” Journal of Informetrics, vol. 10, no. 2, Elsevier Ltd, May 2016, pp. 658–60, doi:10.1016/j.joi.2016.04.008.

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/

Best Practices for Metrics or Indicators

a metric or an indicator is a proxy; it has the authority to represent something else

Metrics should be easy to understand, open and transparent.

Metrics should not substitute for informed, qualitative assessment.

Different contexts may require different sets of metrics.

Best Practices for Metrics or Indicators

Allow those evaluated to verify data and analysis.

Account for variation in fields related to publication and citation practices.

Keep in mind that basic citation **metrics can have bias** caused by differences in:

- publication patterns between research fields,
- publication growth and speed,
- different document types,
- time frames
- and/or database coverage.

Where we are going
(Technology time)

A Quick Note: Databases

Database	Item Count and Content Coverage	Availability	Basic Metrics	Advanced Metrics
Google Scholar by Google	**160M 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	**32M records** [5,618 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)

A Quick Note: Databases

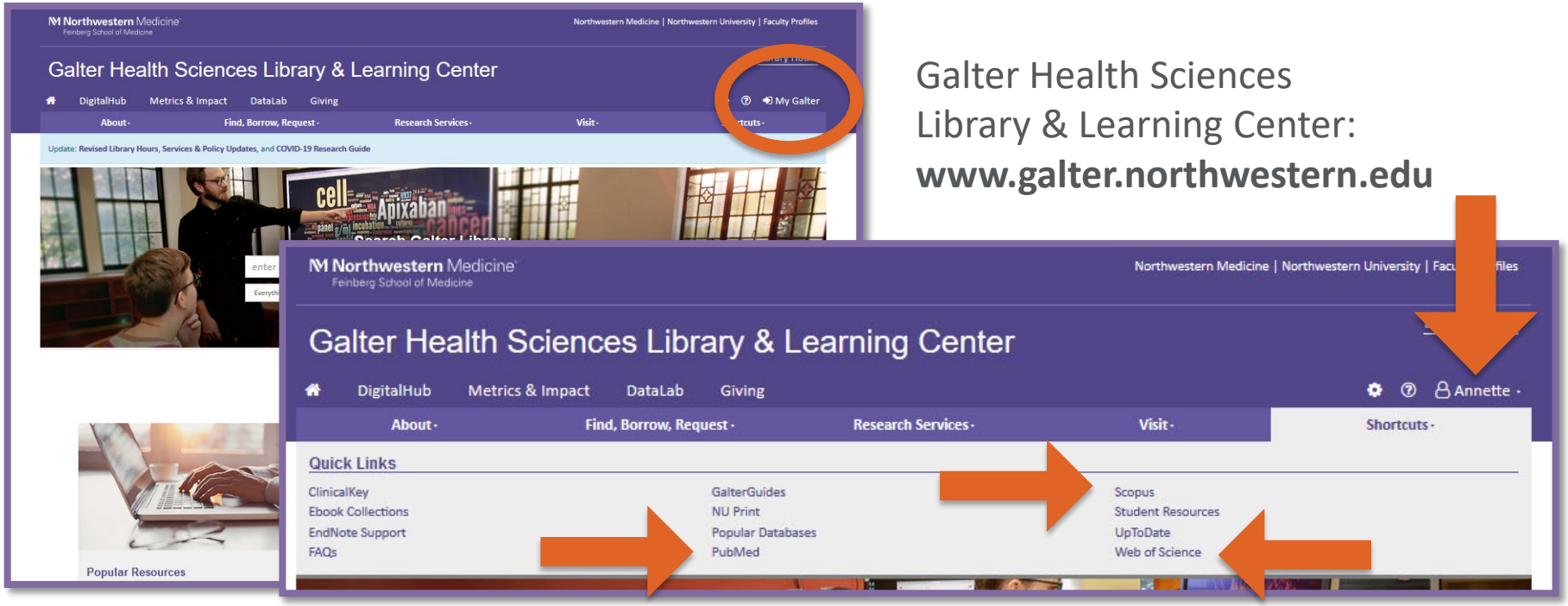
Dimensions

A linked research information dataset that connects grants, publications, datasets and clinical trials to patents and policy documents. Dimensions indexes data from a myriad of sources so that you can track and understand the complete research cycle. The platform includes a free version as well as subscriptions for analytics and cloud services.

Microsoft Academic

Microsoft Academic (MA) uses machine readers powered by artificial intelligence (AI) to scan and extract knowledge from all scholarly publications discovered and indexed by Bing. Bing indexes data from a variety of sources ranging from publisher sites to individual authors' personal homepages. MA's AI agent then cleans and organizes these data into a graph database we call the Microsoft Academic Graph (MAG).

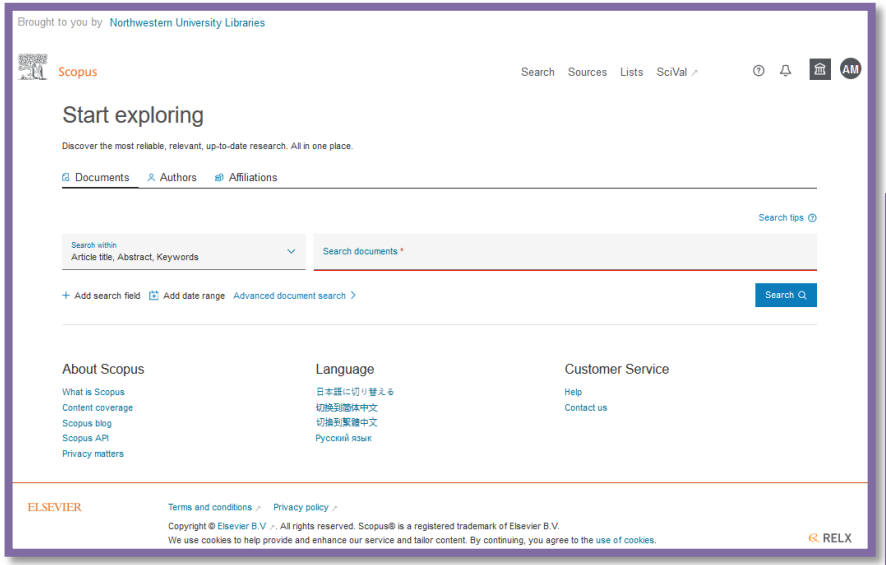
Getting to Scopus, Web of Science and PubMed

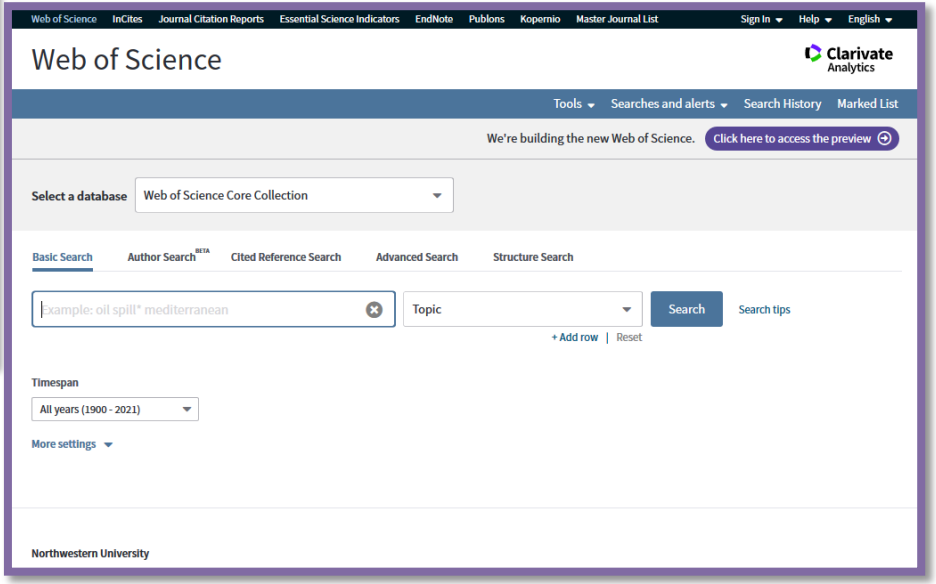


Galter Health Sciences Library & Learning Center:
www.galter.northwestern.edu

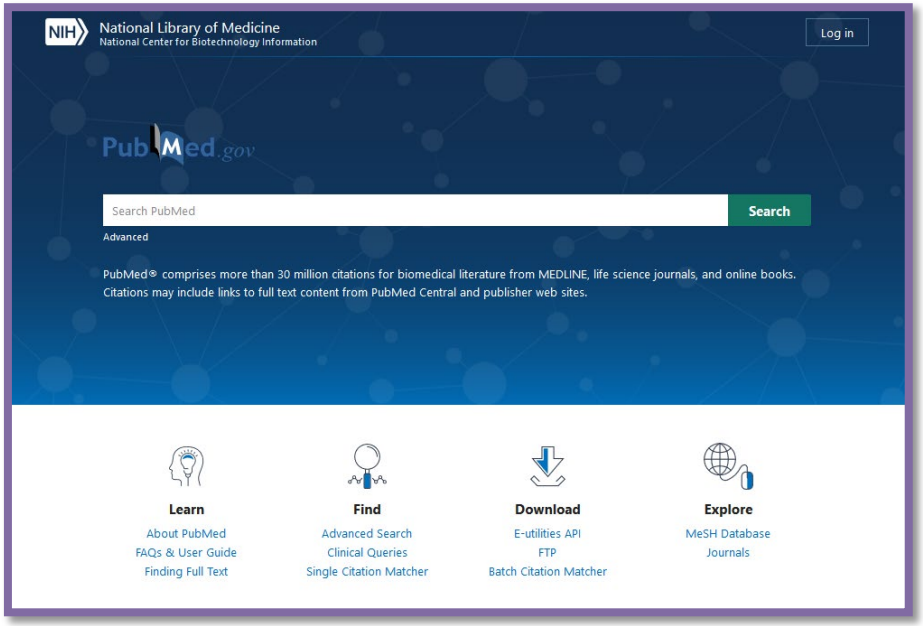
To learn more about accessing resources at Galter Library visit the Online Resource Access page on the Library Services FAQs libguide.

Scopus and Web of Science Home Pages

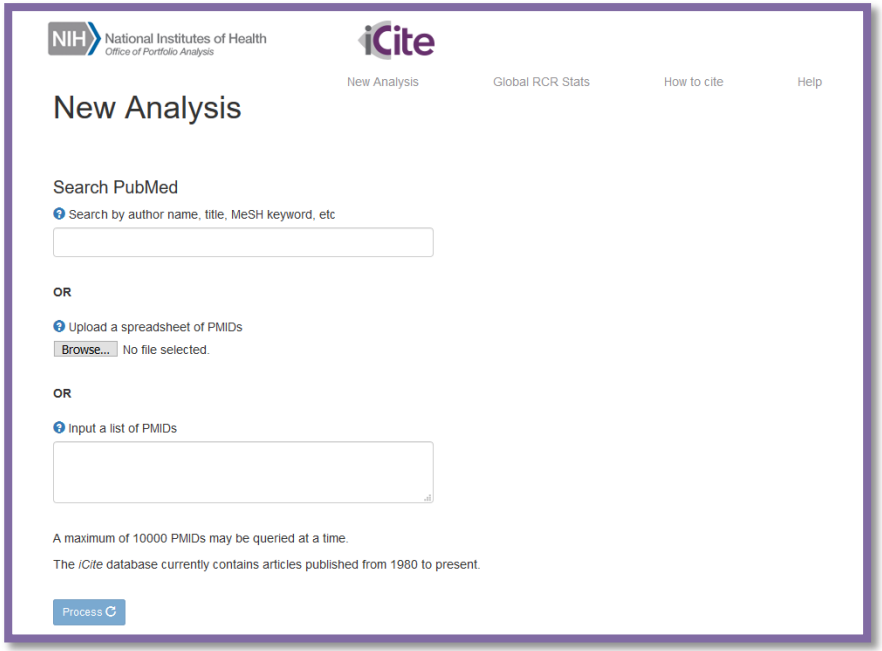




PubMed and iCite

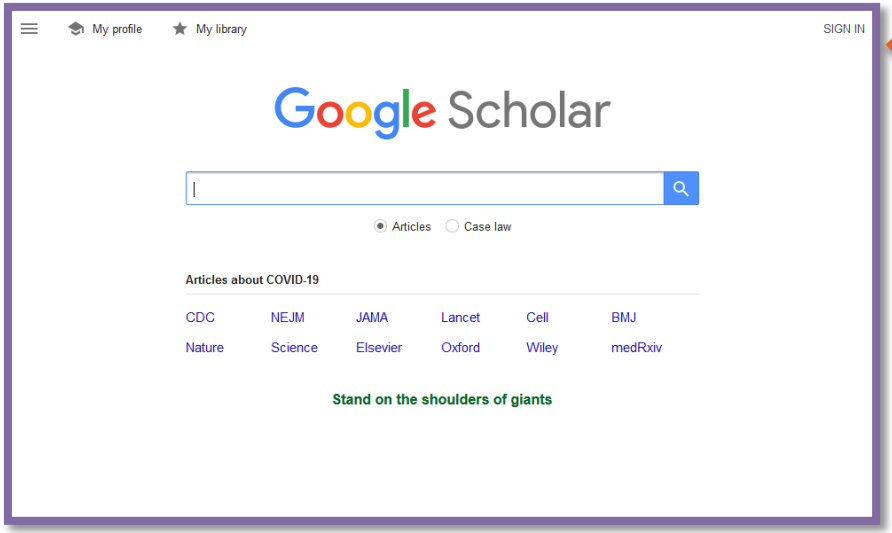


https://pubmed.ncbi.nlm.nih.gov/

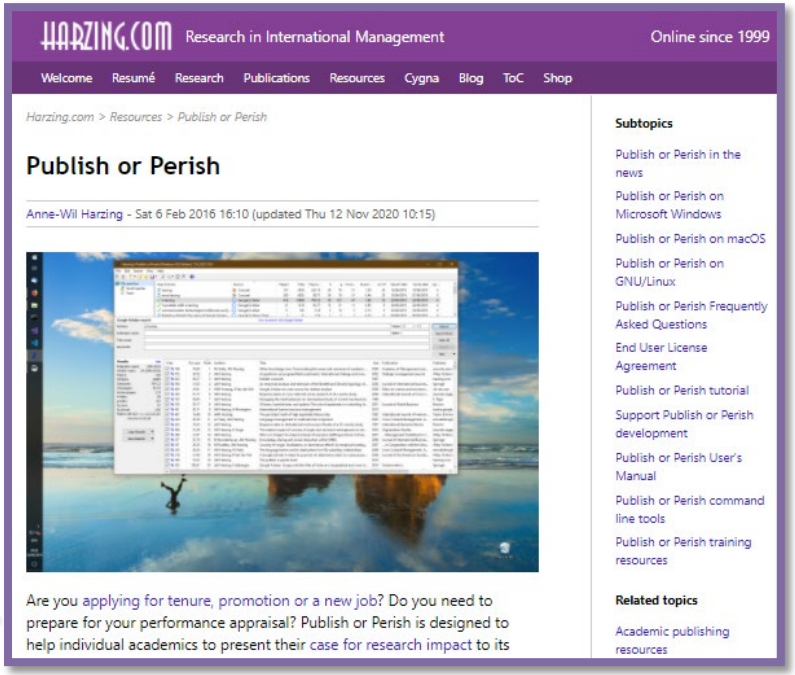


https://icite.od.nih.gov/analysis

GoogleScholar and Publish or Perish



https://scholar.google.com/

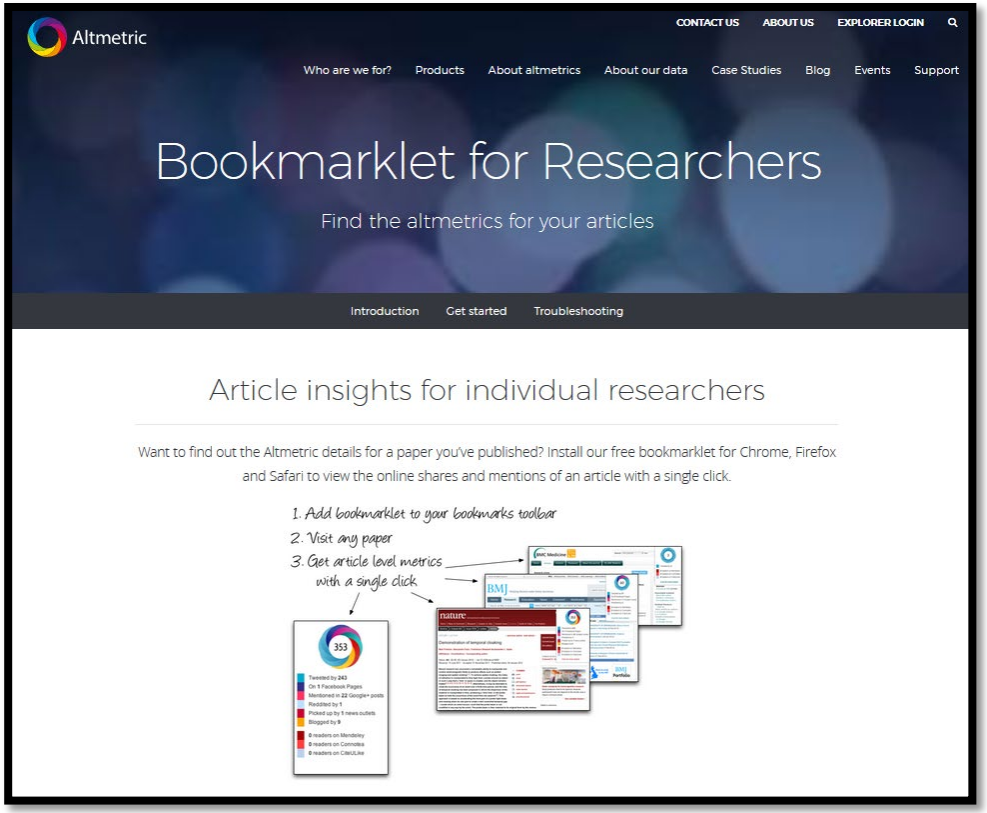


https://harzing.com/resources/publish-or-perish

Altmetric Bookmarklet

How to get there:

1. Go to Altmetric.com
2. Click on “For Researchers”
3. Scroll down to section entitled “Tools for researchers”
4. Select “Altmetric Bookmarklet”
5. Follow the download instructions



Northwestern Medicine®
Feinberg School of Medicine

Exploring Metrics

Author Level Metrics

Author level metrics help track an individual researcher's impact in an academic discipline.

Author Level Metrics	Article or Book Level Metrics	Journal Level Metrics
g-index	Altmetrics Attention Score	CiteScore
h-index	Category Normalized Citation Impact	Eigenfactor
i10-index	Citation Count	Immediacy Index
m-quotient	Field Citation Ratio (FCR)	Journal Impact Factor (JIF)
	Field Weighted Citation Impact (FWCI)	SCImago Journal Rank (SJR)
	Relative Citation Ratio (RCR)	Source Normalized Impact per Paper (SNIP)

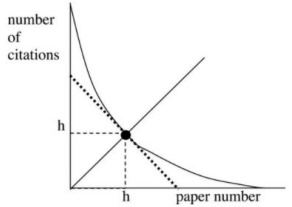
h-index

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.

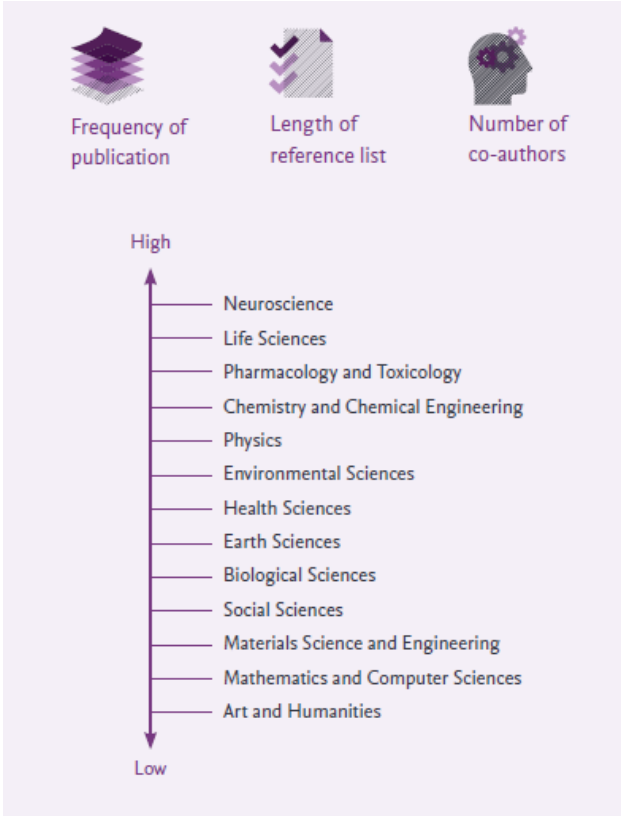
A Quick Note: Field Normalized

? ≠ ?

? ≠ ?

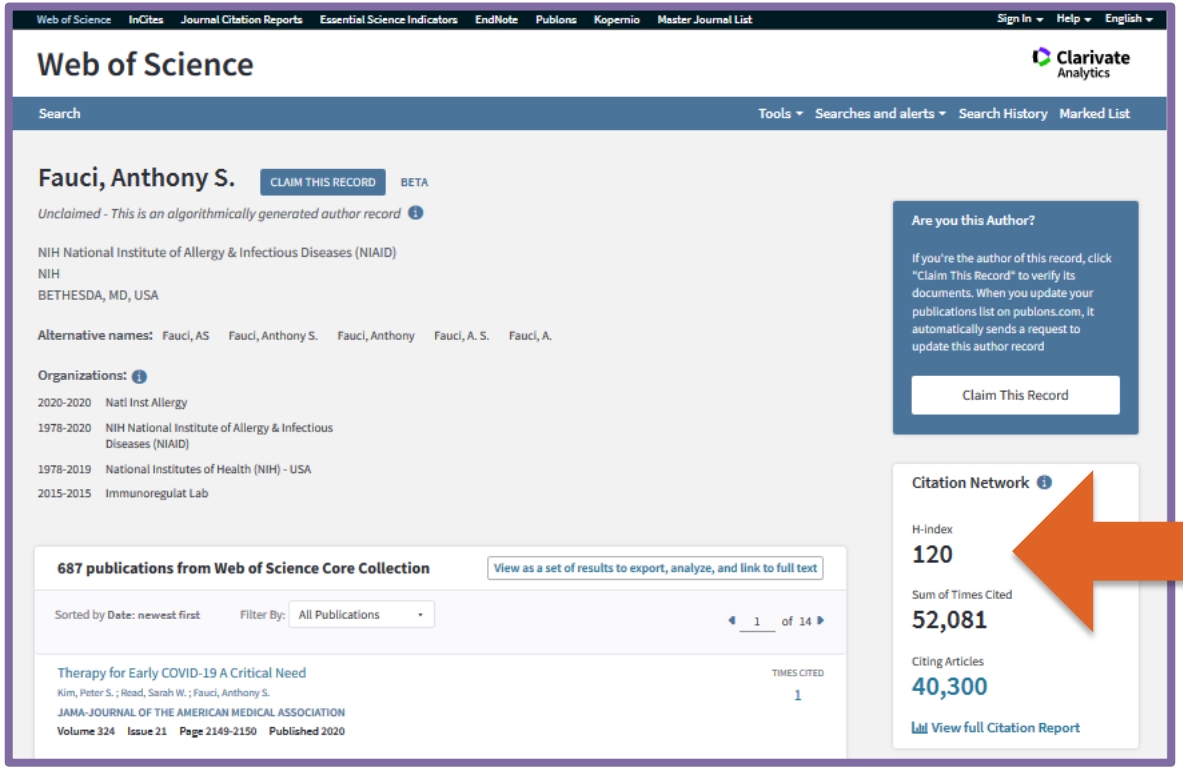
"a scientometric indicator that in some way corrects for differences between scientific fields…is referred to as a field-normalized indicator"

Reference: Waltman, v. (2018). Field normalization of scientometric indicators. https://arxiv.org/ftp/arxiv/papers/1801/1801.09985.pdf

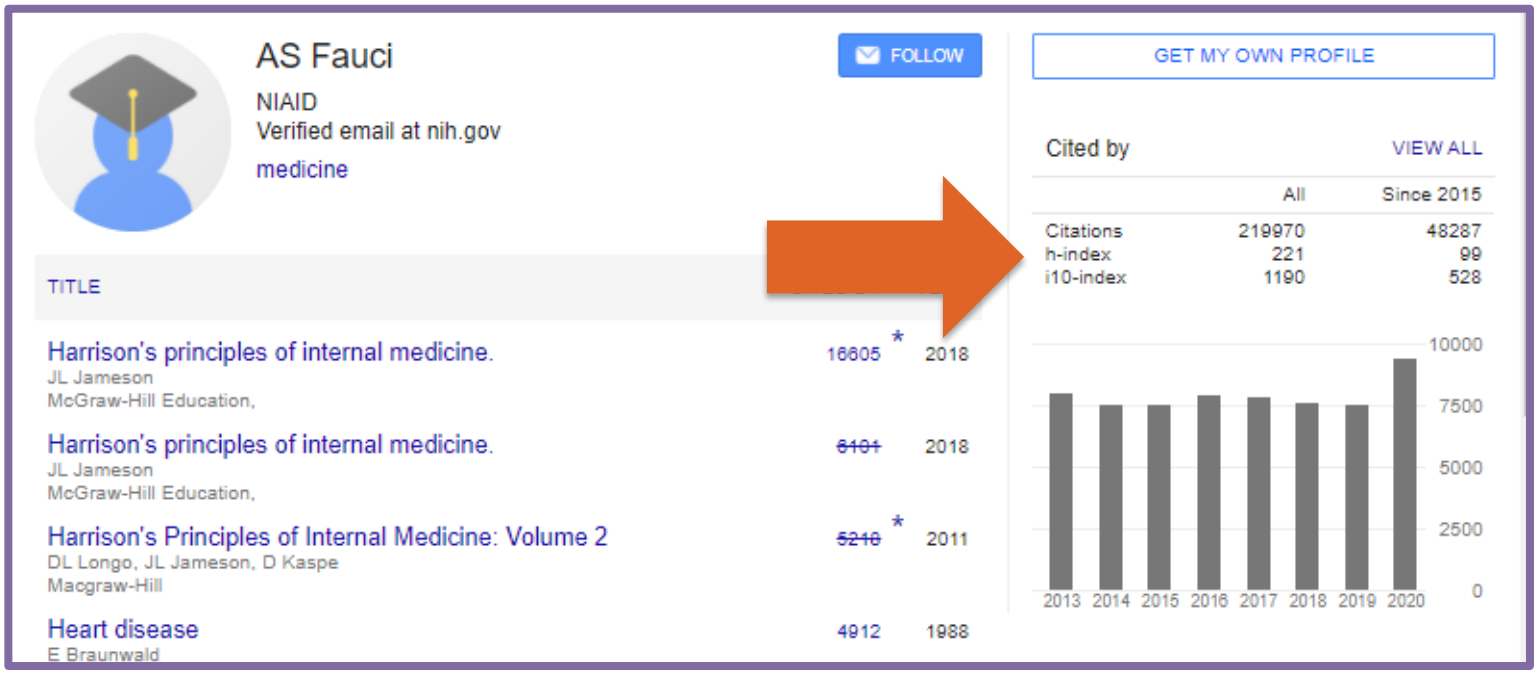


Where to find it: h-index

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.*

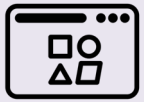
Something To Think About

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]

i10-index



Use Case

The 1-10 index is used as evidence of the scholarly influence of an author's, or group of authors', body of work.

Definition

The i10-index is equivalent to the number of publications by an author with at least 10 citations.

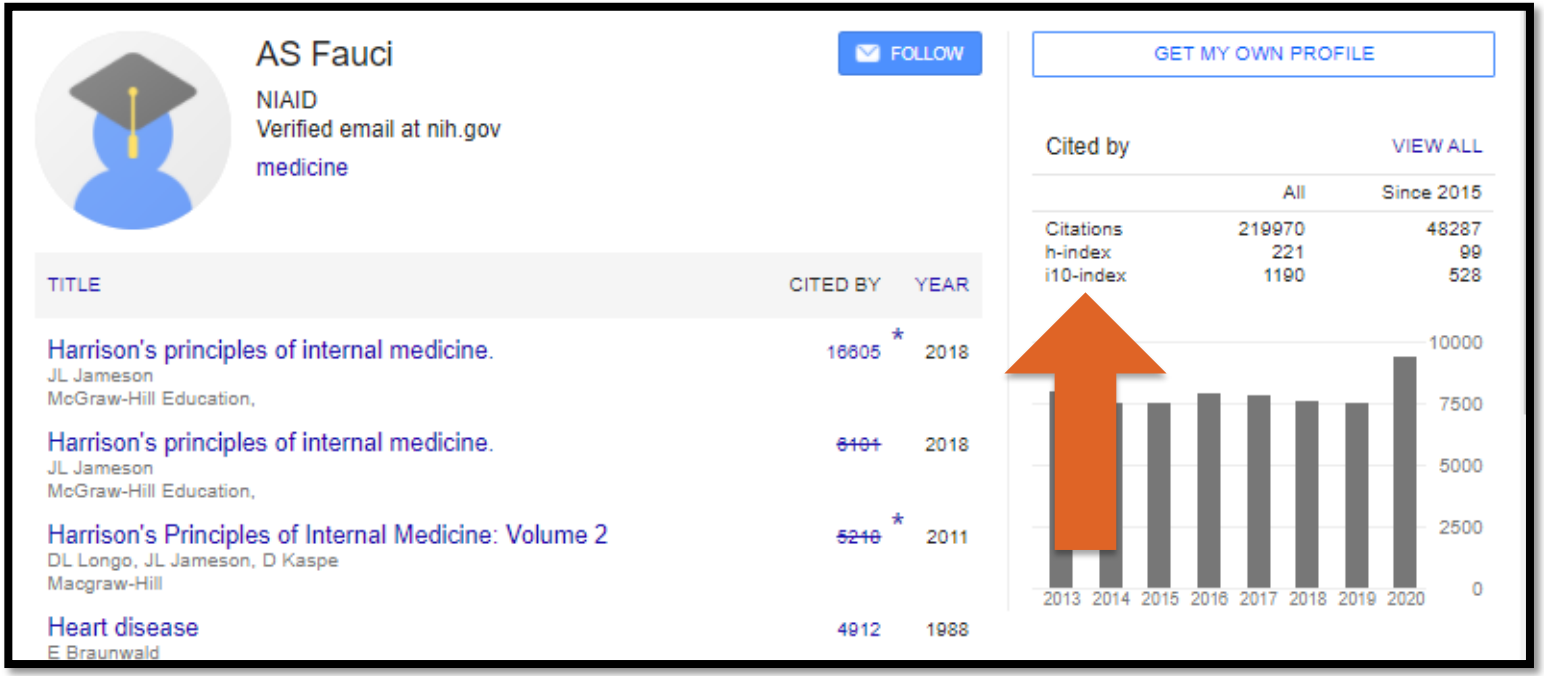
Location

The i10-index can be found in Google Scholar.

Caveats

- Not field normalized.
- Only available in Google Scholar.

Where to find it: i10-index



Final Thoughts: i10-index

Metric statement: *Dr. Fauci currently has an i10-index of 1190 (Google Scholar).*

What that means: *Dr. Fauci has at least 1190 papers that are cited at least 10 times.*

Something To Think About

Problems with reproducibility in Google Scholar – why?

- Low quality of metadata, including lack of DOI
- Lack of advanced search options
- Data manipulations due to fake documents on the web

Author Level Metrics – the others

g-index

The g-index is the (unique) largest number such that the top g articles received (together) at least g^2 citations.

*A g-index of 20 means that an academic has published at least 20 articles that **combined** have received at least 400 citations.*

Not available readily calculated in any citation databases.

m-quotient

The m-quotient is calculated by dividing the h-index by the number of years the academic has been active (measured as the number of years since the first published paper).

Not available readily calculated in any citation databases.

Pop Quiz!

Which of the following situations is a good use of the h-index?

A. Comparing the citation impact of researchers from different fields.

B. Finding highly cited researchers in a field of interest.

C. Deciding which researcher should receive an award.

D. Estimating the broad impact of a researcher's contributions.

SlideLizard

Pop Quiz!

Using the information in the table below, answer the four questions:

Paper	Citations
1	11
2	10
3	7
4	3
5	2

1. What is my h-index?
2. Which paper does NOT contribute to my h-index?
3. Which paper could receive one more citation and my h-index would increase by one?
4. What is my i10-index?

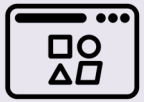
SlideLizard

Article Level Metrics

Article level metrics quantify the reach and impact of published research

Author Level Metrics	Article or Book Level Metrics	Journal Level Metrics
g-index	Altmetrics Attention Score	CiteScore
h-index	Category Normalized Citation Impact	Eigenfactor
i10-index	Citation Count	Immediacy Index
m-quotient	Field Citation Ratio (FCR)	Journal Impact Factor (JIF)
	Field Weighted Citation Impact (FWCI)	SCImago Journal Rank (SJR)
	Relative Citation Ratio (RCR)	Source Normalized Impact per Paper (SNIP)

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.

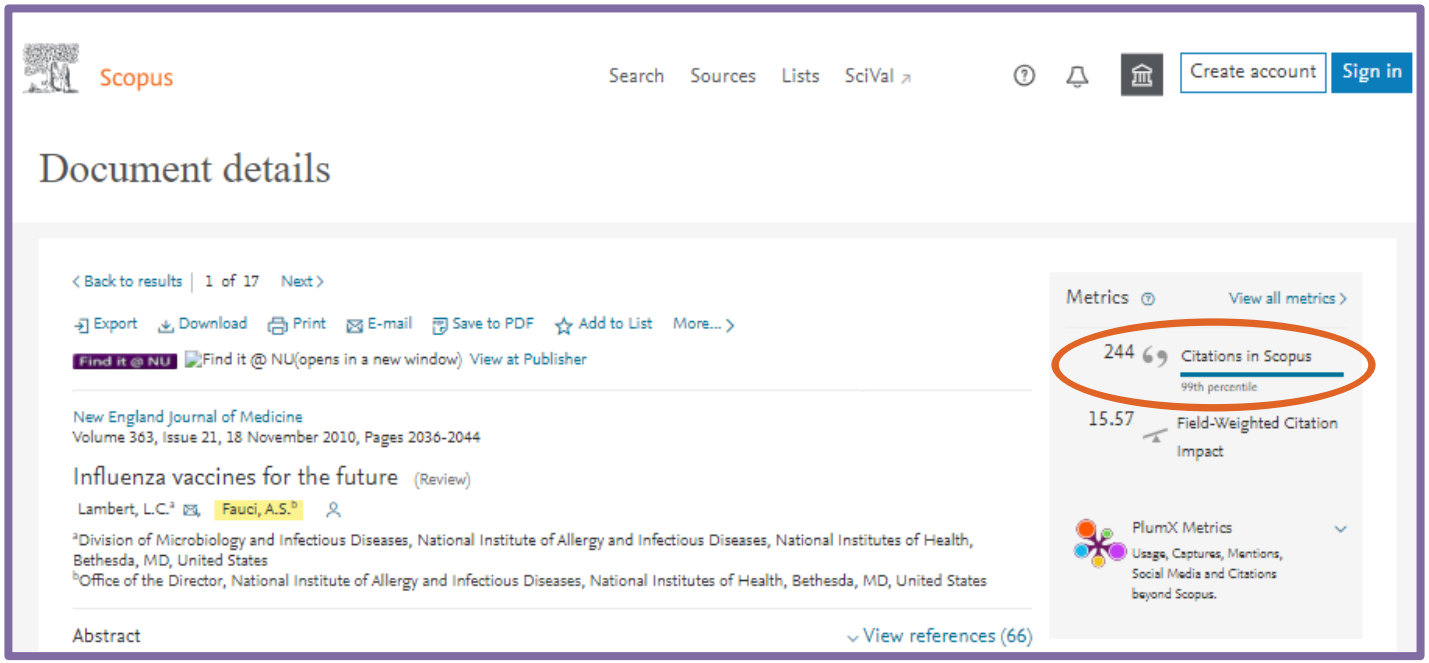
Location

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

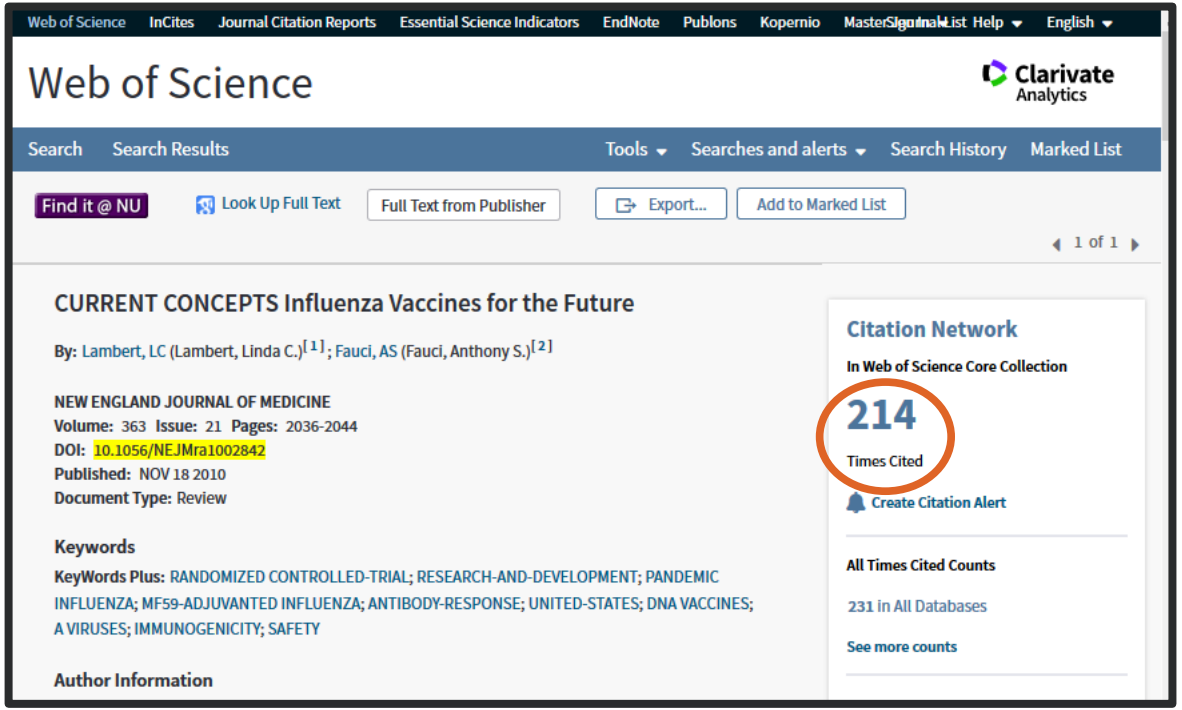
Caveats

- **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

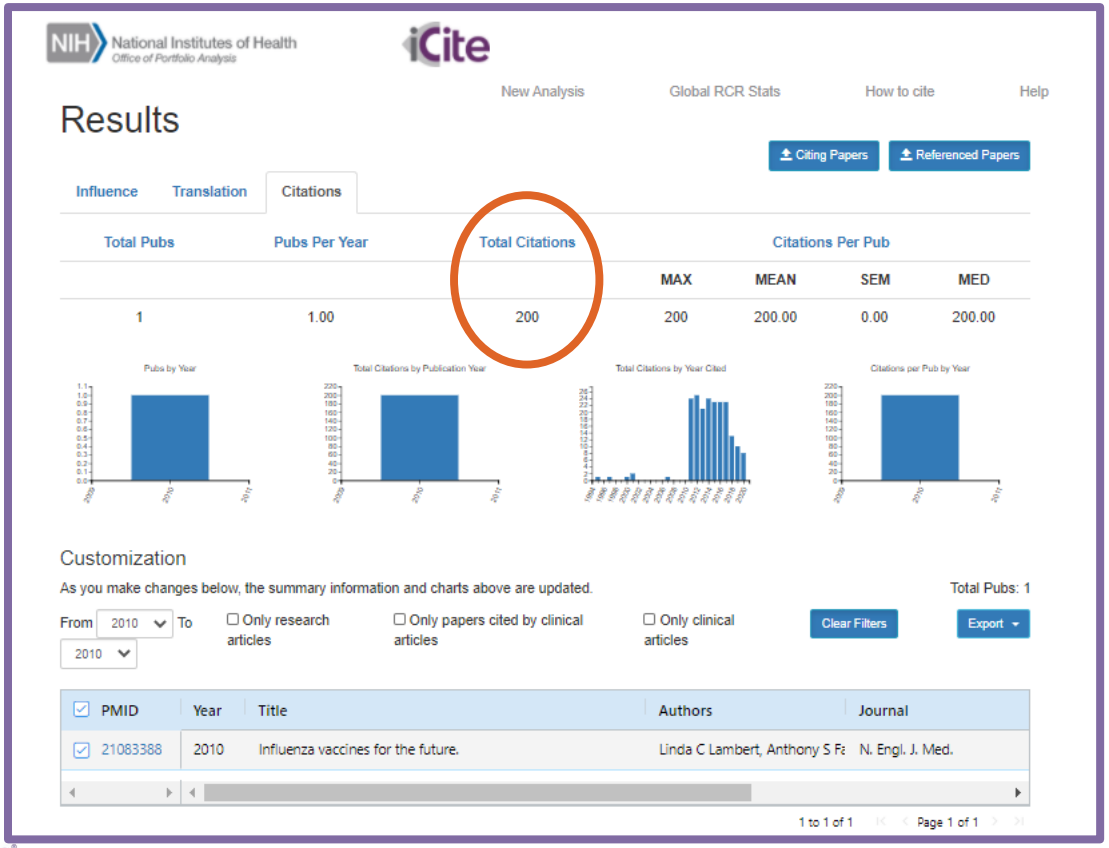


Where to find it: Citation Count



Where to find it: Citation Count

Where to find it: Citation Count



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.*

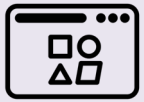
Something To Think About

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.

Field Weighted Citation Impact (FWCI)



Use Case

The FWCI facilitates the benchmarking of citation performance across groups of different size, disciplinary scope and age, such as research large groups, institutions, or geographic regions.

Definition

The FWCI is the ratio of the document's citations to the average number of citations received by all similar documents (same document type, publication and field) over a three-year window (in the publication year and the following three years).

$$FWCI_i = \frac{c_i}{e_i}$$

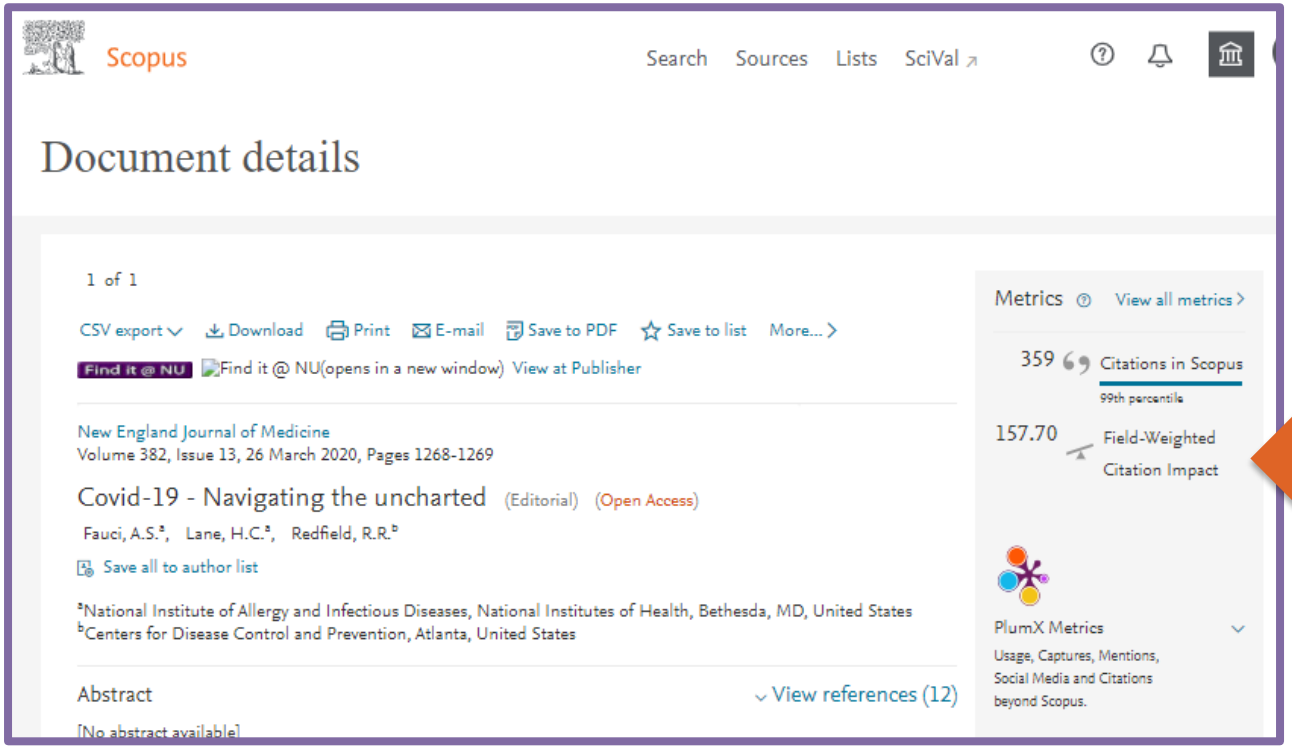
Location

The FWCI can be found in Scopus (SciVal).

Caveats

- Is field normalized.
- For papers published in more than one field, the FWCI is determined based on a harmonic mean of the scores from those fields so that each field makes an equal contribution to the metric.
- Only available for publications indexed in Scopus.

Where to find it: Field Weighted Citation Impact (FWCI)



Final Thoughts: Field Weighted Citation Impact (FWCI)

Metric statement: *This 2020 editorial by Dr. Fauci has a field weighted citation impact of 157.70, indicating it is 157 times more cited than expected (Scopus).*

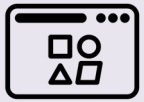
What that means: *The actual number of citations that Dr. Fauci's editorial received is significantly higher than the average expected for an editorial published in the same field at the same time.*

Something To Think About

"The FWCI is a sophisticated indicator and normalizes citations across publication year, field, and document type. It is used by various research bodies to benchmark research impact regardless of differences in entity size, disciplinary profile, age, and publication-type composition."

Reference: Purkayastha, Palmaro. "Comparison of Two Article-Level, Field-Independent Citation Metrics: Field-Weighted Citation Impact (FWCI) and Relative Citation Ratio (RCR)." Journal of Informetrics, vol. 13, no. 2, Elsevier Ltd, May 2019, pp. 635–42, doi:10.1016/j.joi.2019.03.012.

Relative Citation Ratio (RCR)



Use Case

The RCR helps to understand the relative scholarly influence that a scientific article has had, as compared to other NIH-funded research.

Definition

The RCR represents a citation-based measure that is calculated as the cites/year of each paper, normalized to the citations per year received by NIH-funded papers in the same field and year.

$$RCR_i = \frac{ACR_i}{ECR_i^Y}$$

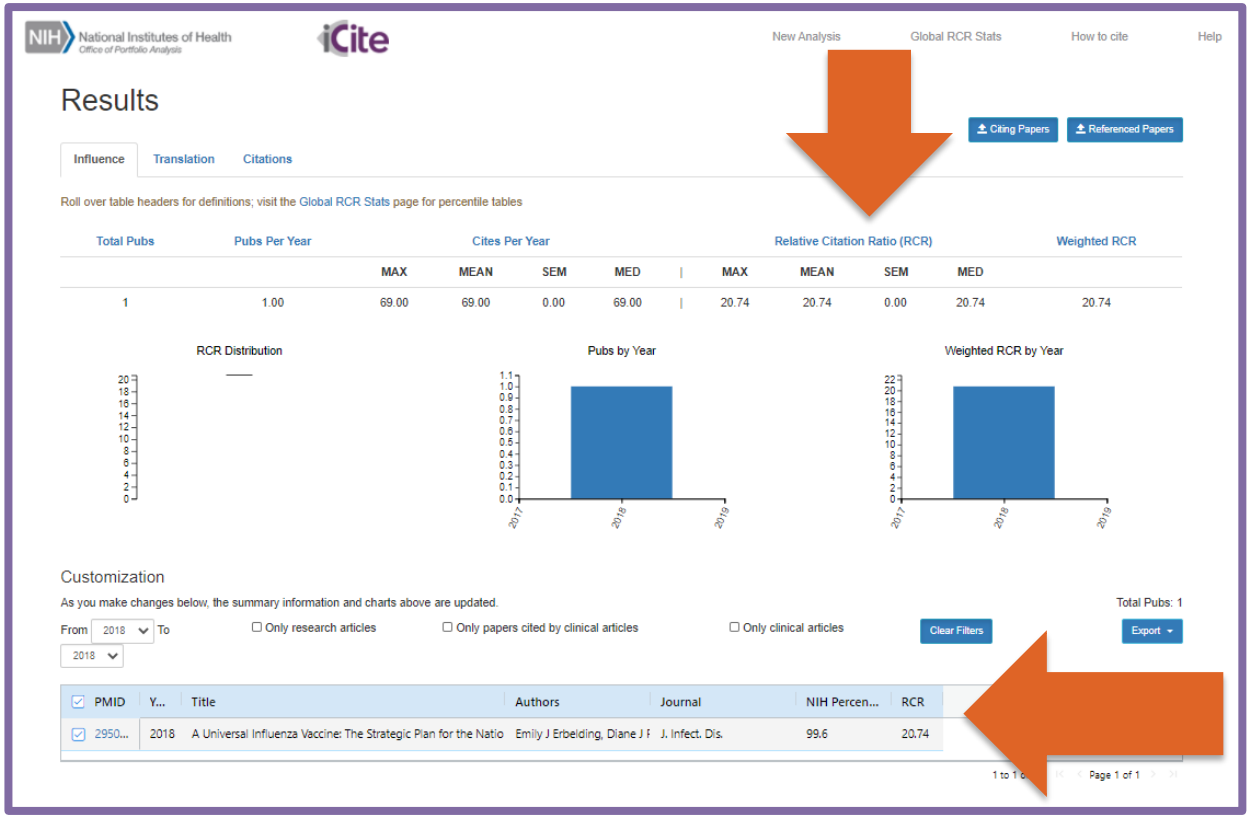
Location

The RCR can be found in iCite.

Caveats

- **Is field normalized.**
- **Benchmarked on NIH funding, therefore likely not useful outside of US.**
- **Only available for MEDLINE citations from 1995 on.**
- **Not available for papers published in the last fiscal year.**

Where to find it: Relative Citation Ratio (RCR)



Final Thoughts: Relative Citation Ratio (RCR)

Metric statement: *This 2020 article by Dr. Fauci has a relative citation ratio of 20.74, indicating it has been cited 20x more than expected when compared to other NIH funded work (iCite).*

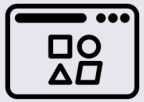
What that means: *The actual number of citations that Dr. Fauci's article received is significantly higher than the average expected for a similar document published by funded NIH researchers at the same time.*

Something To Think About

Applying for NIH funding? "Because the RCR makes it straightforward to communicate how a particular article compares to NIH R01-funded works, it has the potential to be a particularly compelling metric among users focused on NIH funding as a primary measure of impact."

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.

Altmetric Attention Score



Use Case

The Altmetric Attention Score is best used by individual researchers to understand the overall volume of attention that research has received online.

Definition

The Altmetric Attention Score represents a weighted approximation of all the attention that the company Altmetric can find for a research output. The score is based on three main factors, which are volume, sources, and authors. The colors of the Altmetric donut each represent a different source of attention.

Location

The Altmetric Attention Score is included in some databases and repositories. It can also be accessed via the Altmetric Bookmarklet.

Caveats

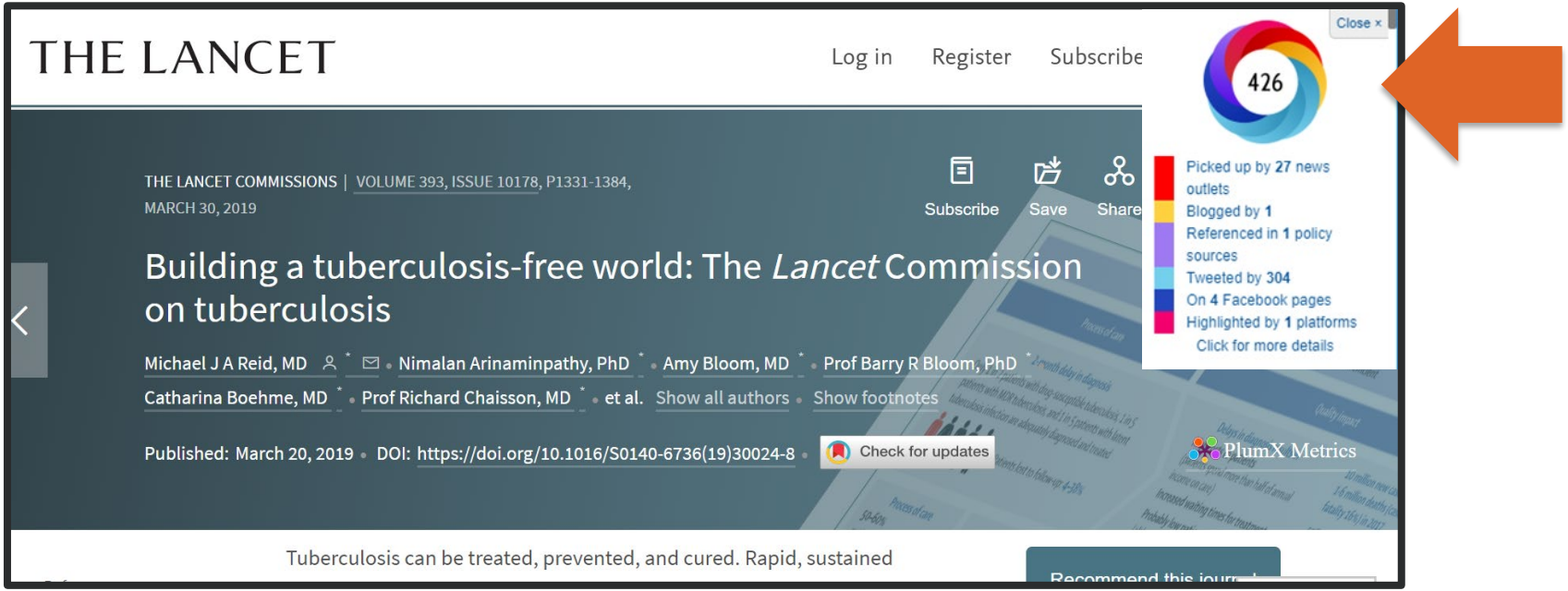
- Score can increase or decrease over time.
- Attention can be positive or negative.
- Score does not include Mendeley readers, Dimensions citation counts and CiteULike bookmarks.

A Quick Note: Alternative Metrics

- New way to measure engagement with research outputs
- Data that explains 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, Mendeley readers, post-publication peer review, citations in policy documents)
- Complementary to bibliometrics (citation-based)

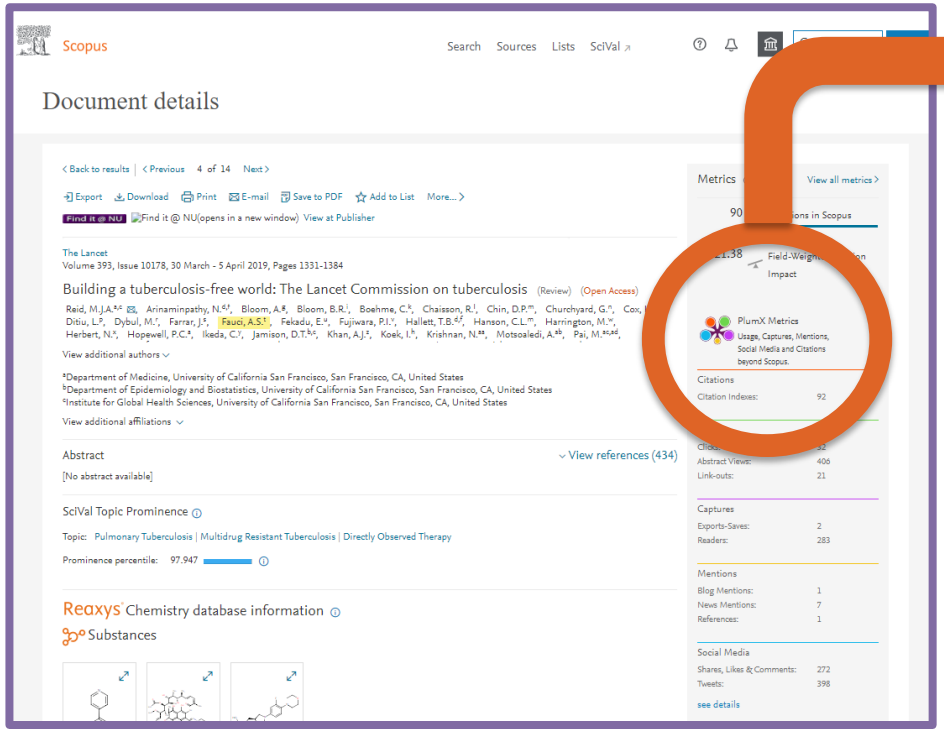
Where to find it: Altmetric Attention Score

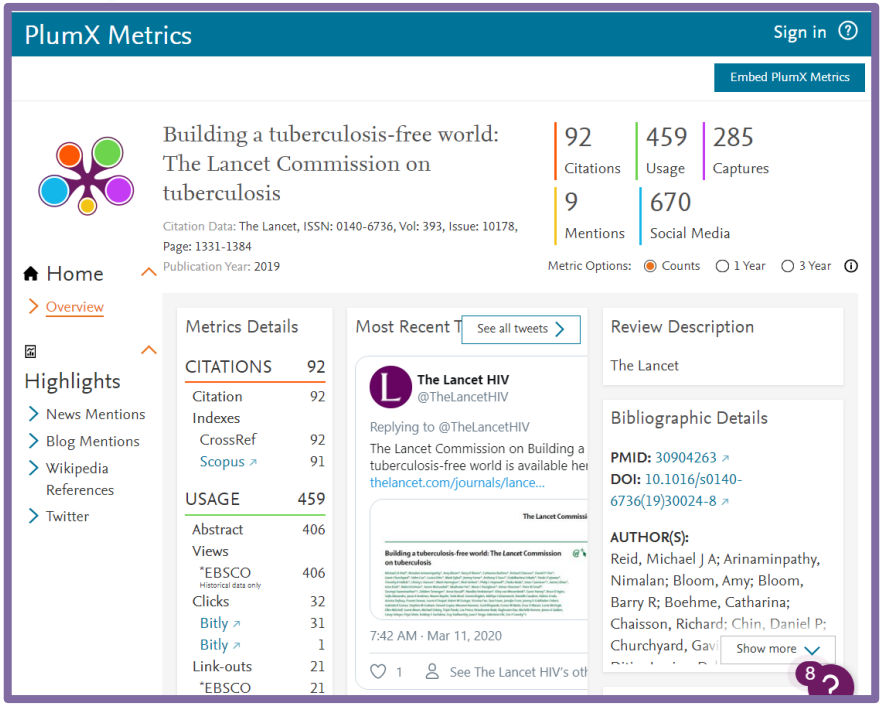


Close ×
426
Picked up by 27 news outlets
Blogged by 1
Referenced in 1 policy sources
Tweeted by 304
On 4 Facebook pages
Click for more details

Altmetric
What is this page?
Embed badge
Share
Building a tuberculosis-free world: The Lancet Commission on tuberculosis
Overview of attention for article published in The Lancet, March 2019
426
SUMMARY
News
Blogs
Policy documents
Twitter
Facebook
Research highlights
More...
Title Building a tuberculosis-free world: The Lancet Commission on tuberculosis
Published in The Lancet, March 2019
DOI 10.1016/s0140-6736(19)30024-8
Pubmed ID 30904263
Authors Michael J A Reid, Nimalan Arinaminpathy, Amy Bloom, Barry R Bloom, Catharina Boehme, Richard... [show]
View on publisher site
Alert me about new mentions
TWITTER DEMOGRAPHICS
MENDELEY READERS
ATTENTION SCORE IN CONTEXT
About this Attention Score
In the top 5% of all research outputs scored by Altmetric
High Attention Score compared to outputs of the same age (99th percentile)
High Attention Score compared to outputs of the same age and source (96th percentile)
LESS...
Mentioned by
27 news outlets
1 blog
1 policy source
304 tweeters
4 Facebook pages
1 research highlight platform
Citations
109 Dimensions
The data shown below were collected from the profiles of 304 tweeters who shared this research output. Click here to find out more about how the information was compiled.
1
55
Geographical breakdown
Country
Count
As %
Demographic breakdown
Type
Count
As %

THE LANCET
Log in
THE LANCET COMMISSIONS | VOLUME 393, ISSUE 10178, P1331-1384, MARCH 30, 2019
Building a tuberculosis-free world: The Lancet Commission
Michael J A Reid, MD
Nimalan Arinaminpathy, PhD
Amy Bloom, MD
Catharina Boehme, MD
Prof Richard Chaisson, MD
et al.
Show all authors
Show footnotes
Published: March 20, 2019
DOI: https://doi.org/10.1016/S0140-6736(19)30024-8
Check for
Citations
Citation Indexes: 92
Captures
Exports-Saves: 2
Readers: 283
Mentions
Blog Mentions: 1
News Mentions: 7
References: 1
Social Media
Shares, Likes & Comments: 272
Tweets: 398
see details
PlumX Metrics
PlumX Metric
Tuberculosis can be treated, prevented, and cured. Rapid, sustained declines in tuberculosis deaths in many countries during the past 50 years provide compelling evidence that ending the pandemic is feasible. Yet this disease—which has plagued humanity since before recorded history and has killed hundreds of millions of people over the past two centuries—remains a relentless scourge. In 2017, 1·6 million people died from tuberculosis, including 300 000 people with HIV, representing more deaths than any other infectious disease. Moreover, in many parts of the world, drug-resistant forms of tuberculosis threaten struggling control efforts. The world can no longer ignore the enormous pall cast by the tuberculosis epidemic. Going forward, the global tuberculosis response must be an inclusive, comprehensive response within the broader sustainable development agenda. No one-size-fits-all approach


Scopus
Search
Sources
Lists
SciVal
Document details
Back to results
Previous
4 of 14
Next
Export
Download
Print
E-mail
Save to PDF
Add to List
More...
Find it @ NU
Find it @ NU(opens in a new window)
View at Publisher
The Lancet
Volume 393, Issue 10178, 30 March - 5 April 2019, Pages 1331-1384
Building a tuberculosis-free world: The Lancet Commission on tuberculosis
(Review)
(Open Access)
Reid, M.J.A.
Arinaminpathy, N.
Bloom, A.
Bloom, B.R.
Boehme, C.
Chaisson, R.
Chin, D.P.
Churchyard, G.
Cox,
Ditiu, L.
Dybul, M.
Farrar, J.
Fauci, A.S.
Fekadu, E.
Fujiwara, P.I.
Hallett, T.B.
Hanson, C.L.
Harrington, M.
Herbert, N.
Hopewell, P.C.
Ikeda, C.
Jamison, D.T.
Khan, A.J.
Koek, I.
Krishnan, N.
Motsoaledi, A.
Pai, M.
View additional authors
Department of Medicine, University of California San Francisco, San Francisco, CA, United States
Department of Epidemiology and Biostatistics, University of California San Francisco, San Francisco, CA, United States
Institute for Global Health Sciences, University of California San Francisco, San Francisco, CA, United States
View additional affiliations
Abstract
View references (434)
[No abstract available]
SciVal Topic Prominence
Topic: Pulmonary Tuberculosis | Multidrug Resistant Tuberculosis | Directly Observed Therapy
Prominence percentile: 97.947
Reaxys Chemistry database information
Substances
Metrics
View all metrics
Field-Weighted Impact
PlumX Metrics
Usage, Captures, Mentions, Social Media and Citations beyond Scopus.
Citations
Citation Indexes: 92
Abstract Views: 406
Link-outs: 21
Captures
Exports-Saves: 2
Readers: 283
Mentions
Blog Mentions: 1
News Mentions: 7
References: 1
Social Media
Shares, Likes & Comments: 272
Tweets: 398
see details


PlumX Metrics
Sign in
Embed PlumX Metrics
Building a tuberculosis-free world: The Lancet Commission on tuberculosis
Citation Data: The Lancet, ISSN: 0140-6736, Vol: 393, Issue: 10178, Page: 1331-1384
Publication Year: 2019
92 Citations
459 Usage
285 Captures
9 Mentions
670 Social Media
Metric Options: Counts 1 Year 3 Year
Home
Overview
Highlights
News Mentions
Blog Mentions
Wikipedia References
Twitter
Metrics Details
CITATIONS 92
Citation Indexes 92
CrossRef 92
Scopus 91
USAGE 459
Abstract Views 406
*EBSCO 406
Historical data only
Clicks 32
Bitly 31
Bitly 1
Link-outs 21
*EBSCO 21
Most Recent T
See all tweets
The Lancet HIV
@TheLancetHIV
Replying to @TheLancetHIV
The Lancet Commission on Building a tuberculosis-free world is available her
thelancet.com/journals/lance...
7:42 AM · Mar 11, 2020
See The Lancet HIV's oth
Review Description
The Lancet
Bibliographic Details
PMID: 30904263
DOI: 10.1016/s0140-6736(19)30024-8
AUTHOR(S):
Reid, Michael J A; Arinaminpathy, Nimalan; Bloom, Amy; Bloom, Barry R; Boehme, Catharina; Chaisson, Richard; Chin, Daniel P; Churchyard, Gav
Show more

Final Thoughts: Altmetric Attention Score

Metric statement: *The Attention Score for this 2019 review by Dr. Fauci indicates that it is in the 99th percentile when compared to outputs of the same age (Altmetric).*

What that means: *This review received significantly more on-line attention when compared to all other reviews published in 2019.*

More impact statement options include:

- There are 4 policy documents that reference this research output.
- There have been 395 tweets from 303 users, with an upper bound of 4,919,556 followers.
- There have been 38 news stories from 27 outlets about this output.

Article Level Metrics – the others

Category Normalized Citation Impact (CNCI)

Calculated by dividing the actual count of citing items by the expected citation rate for documents with the same document type, year of publication and subject area.

Found in the InCites.

Is field normalized.

Field Citation Ratio (FCR)

Calculated by dividing the number of citations a paper has received by the average number received by documents published in the same year and in the same Fields of Research (FoR) category.

Found in the Dimensions database.

Is field normalized.

Pop Quiz!

Trick question:

Paper A received 2000 citations, paper B received 100 citations, which paper has the highest citation impact?

SlideLizard

Pop Quiz!

Which of the following are good uses for the Field Weighted Citation Impact metric?

A. To identify highly impactful papers in a field.

B. To identify highly impactful publications regardless of the year they were published.

C. To review papers in a small field.

D. All of the above.

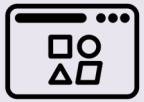
SlideLizard

Journal Level Metrics

Journal level metrics measure the impact, reach, or prestige of a journal or a group of journals.

Author Level Metrics	Article or Book Level Metrics	Journal Level Metrics
g-index	Altmetrics Attention Score	CiteScore
h-index	Category Normalized Citation Impact	Eigenfactor
i10-index	Citation Count	Immediacy Index
m-quotient	Field Citation Ratio (FCR)	Journal Impact Factor (JIF)
	Field Weighted Citation Impact (FWCI)	SCImago Journal Rank (SJR)
	Relative Citation Ratio (RCR)	Source Normalized Impact per Paper (SNIP)

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.

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

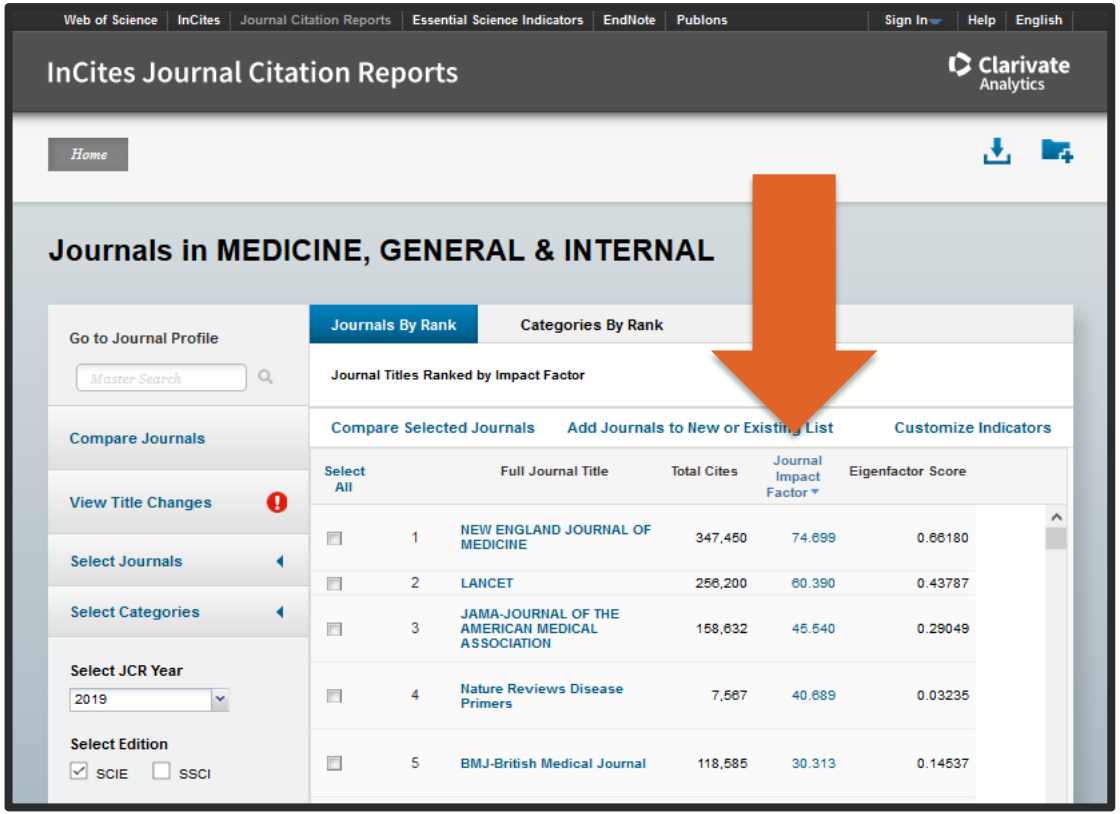
Location

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.*

Something To Think About

"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.

CiteScore

Use Case

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

Definition

The CiteScore is equivalent to the number of citations to documents (articles, reviews, conference papers, book chapters, and data papers) by a journal over four years, divided by the number of the same document types indexed in Scopus and published in those same four years.

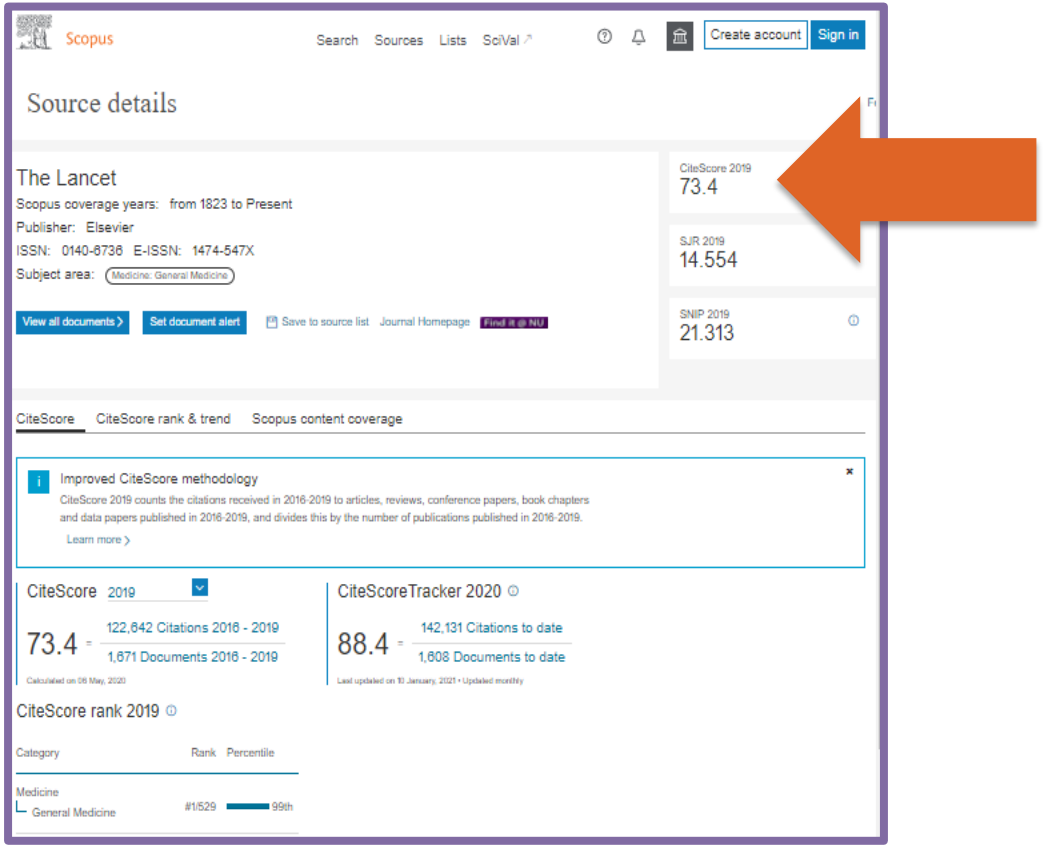
Location

The CiteScore is located in Scopus.

Caveats

- Not field-normalized.
- Only available for journals indexed in Scopus.
- Can be affected by self-citations or highly cited articles within the journal.

Where to find it: CiteScore



Final Thoughts: CiteScore

Metric statement: *The Lancet has a CiteScore of 73.4, which is the highest CiteScore of the 529 journals in the category of General Medicine (Scopus). Of the 1,174 documents authored by Dr. Fauci that are indexed in Scopus, 14 of them were published in The Lancet.*

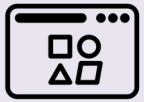
What that means: *The documents published in The Lancet in the most recent four years should receive on average 73.4 citations in the most recent year.*

Something To Think About

Consider using the journal quartile

Both CiteScore and JIF offer quartile ranks for journals in their fields, which are derived by assigning each journal a percentile rank. Journals with a percentile rank of 0.25 or below occupy the top quartile of their field.

Immediacy Index



Use Case

The Immediacy Index can provide a useful perspective when comparing journals specializing in cutting-edge research.

Definition

The Immediacy Index indicates the average number of times an article is cited in the year it is published. It is calculated by dividing the number of citations to articles published in a given year by the number of articles published in that year.

$$\text{Immediacy Index} = \frac{\text{Citations from JCR year to items in JCR year}}{\text{Citable Items in JCR year}}$$

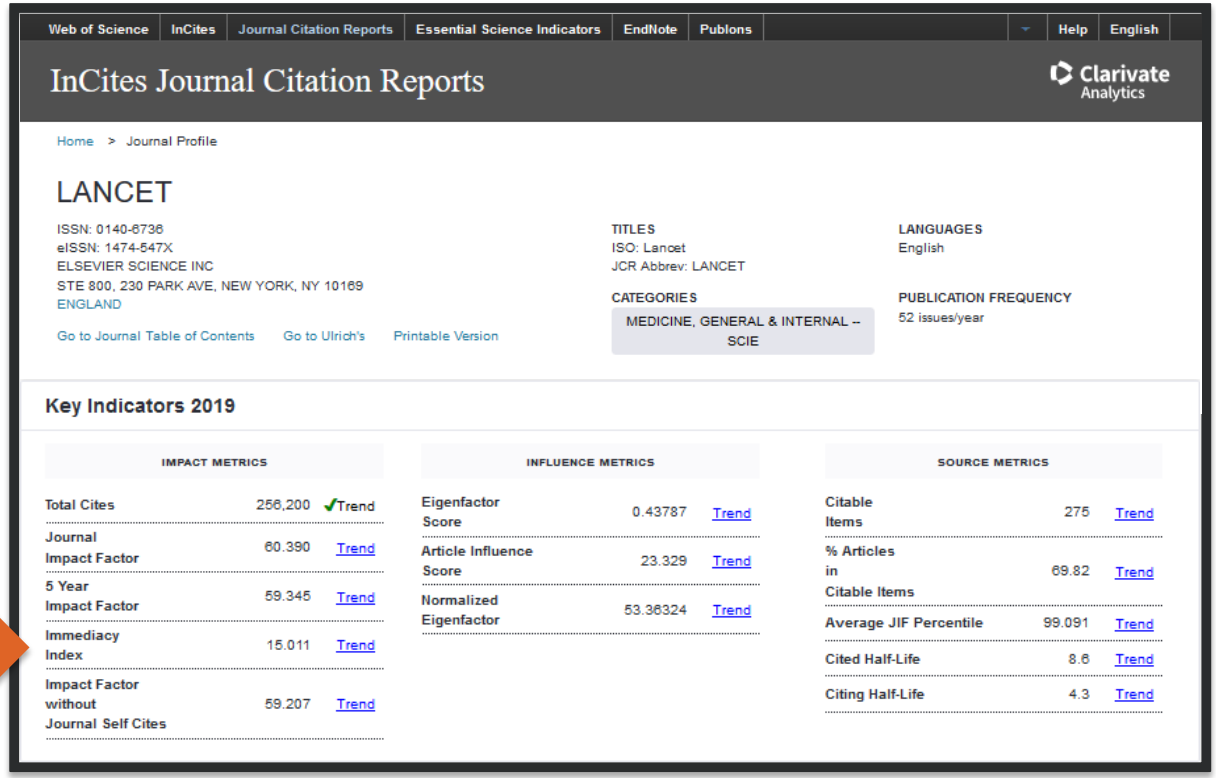
Location

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

Caveats

- **Not field normalized.**
- **May not predict ultimate citation performance.**
- **Not reliable for items published very late in the year.**

Where to find it: Immediacy Index

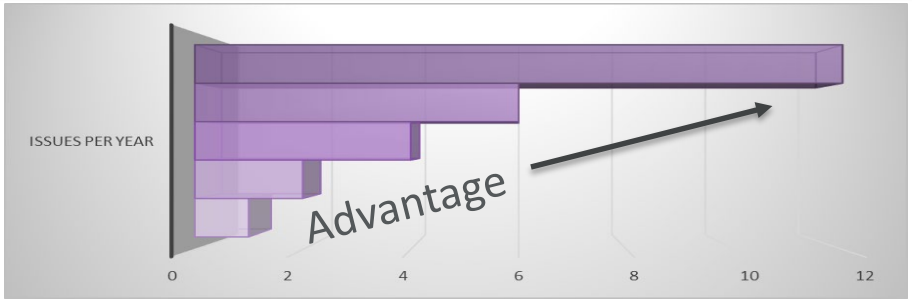


Final Thoughts: Immediacy Index

Metric Statement: *The Lancet has an Immediacy Index of 15 (InCites JCR). A 2015 article co-authored by Dr. Fauci published in Lancet was cited 21 times (Web of Science) that same year.*

What that means: *On average documents published in this journal will receive 15 citations in their first year of publication.*

Something To Think About



Journal Level Metrics – the others

Eigenfactor

Attempts to calculate a percentage estimate of the total time that all journal users spend with that journal compared to all other journals. The numbers are normalized so that the total of all Eigenfactors is 100.

Can be found on the Eigenfactor.org website and on the Journal Citation Report.

SCImago Journal Rank (SJR)

Based on the transfer of prestige from a journal to another one; such prestige is transferred through the references that a journal does to the rest of the journals and to itself.

Available in on the SCImago Journal & Country Rank website as well as in Scopus.

Source Normalized Impact per Paper (SNIP)

Calculated as the number of citations given in the present year to publications in the past three years divided by the total number of publications in the past three years.

Is field normalized.

Can be found on the CWTS Journal Indicators website and in Scopus.

Pop Quiz!

True or False:

- You can use the Journal Impact Factor to compare journals in different fields.

- The average JIF for an author is a good indication of the quality of their work.

SlideLizard

Metrics – Where to find them

	g-index	h-index	i10-index	m-quotient	Altmetric Attention Score	Category Normalized Citation Impact (CNCI)	Citation Count	Field Citation Ratio (FCR)	Field Weighted Citation Impact (FWCI)	Relative Citation Ratio (RCR)	CiteScore	Eigenfactor	Immediacy Index	Journal Impact Factor (JIF)	SCImago Journal Rank (SJR)	Source Normalized Impact per Paper (SNIP)
Altmetric Bookmarklet					X											
CWTS Journal Indicators																X
Dimensions					X		X	X								
Google Scholar		X	X				X									
iCite							X			X						
InCites						X										
Journal Citation Reports												X	X	X		
Microsoft Academic							X									
SCImago Journal & Country Rank															X	
SciVal		X					X		X		X				X	X
Scopus		X					X		X		X				X	X
Web of Science		X					X							X		

Author Level Indicator

Article Level Indicator

Journal Level Indicator

Northwestern Medicine®
Feinberg School of Medicine

How to talk about metrics

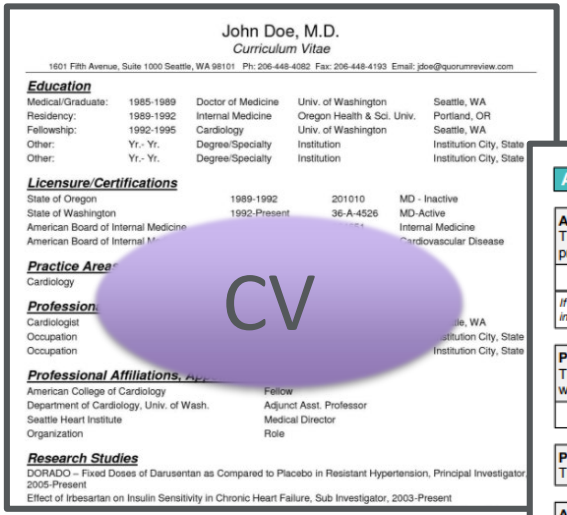
Sample metric statements

Metric statements can include both traditional bibliometrics and alternative metrics. For example:

- *My work has been cited over 1,000 times by authors in over 30 countries, demonstrating the global impact of my work. Ten of my papers are in the top 1% when compared to articles of the same age, field and document type. (Scopus)*
- *This group of papers has been collectively cited over 5,500 times by authors publishing in a diverse range of subject areas including Medicine, Engineering, and Social Services. These 200 papers have a weighted RCR of 305, indicating that this is a highly influential set of papers relative to the average NIH-funded paper. (Scopus, iCite)*
- *Our work has been collectively tweeted over 600 times by the medical community, legal community, and patient advocacy organizations. This activity indicates the successful dissemination our work beyond academia and demonstrates public engagement. Our work was cited in policy documents from the CDC, demonstrating that our work is influencing policy at a national level. (Altmetric)*

Where to add metric statements

Metric statements can be a valuable tool for showcasing the story of your research in your professional profile and a variety of other academic contexts.


John Doe, M.D.
Curriculum Vitae

1601 Fifth Avenue, Suite 1000 Seattle, WA 98101 Ph: 206-448-4082 Fax: 206-448-4193 Email: jdoe@quorumreview.com

Education

Medical/Graduate:	1985-1989	Doctor of Medicine	Univ. of Washington	Seattle, WA
Residency:	1989-1992	Internal Medicine	Oregon Health & Sci. Univ.	Portland, OR
Fellowship:	1992-1995	Cardiology	Univ. of Washington	Seattle, WA
Other:	Yr.- Yr.	Degree/Specialty	Institution	Institution City, State
Other:	Yr.- Yr.	Degree/Specialty	Institution	Institution City, State

Licensure/Certifications

State of Oregon	1989-1992	201010	MD - Inactive
State of Washington	1992-Present	36-A-4526	MD-Active
American Board of Internal Medicine			Internal Medicine
American Board of Internal M			Cardiovascular Disease

Practice Area

Cardiology

Profession

Cardiologist
Occupation
Occupation

Professional Affiliations, A

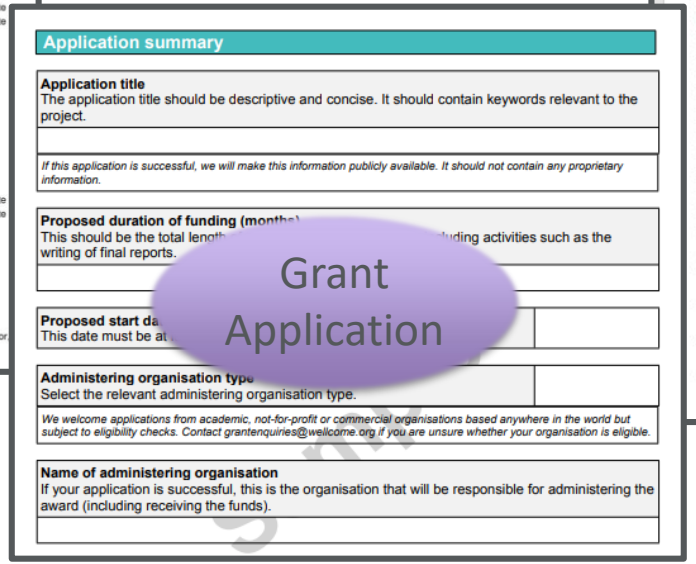
American College of Cardiology	Fellow
Department of Cardiology, Univ. of Wash.	Adjunct Asst. Professor
Seattle Heart Institute	Medical Director
Organization	Role

Research Studies

DORADO – Fixed Doses of Darusentan as Compared to Placebo in Resistant Hypertension, Principal Investigator 2005-Present

Effect of Irbesartan on Insulin Sensitivity in Chronic Heart Failure, Sub Investigator, 2003-Present

CV


Application summary

Application title
The application title should be descriptive and concise. It should contain keywords relevant to the project.

If this application is successful, we will make this information publicly available. It should not contain any proprietary information.

Proposed duration of funding (months)
This should be the total length ... uding activities such as the writing of final reports.

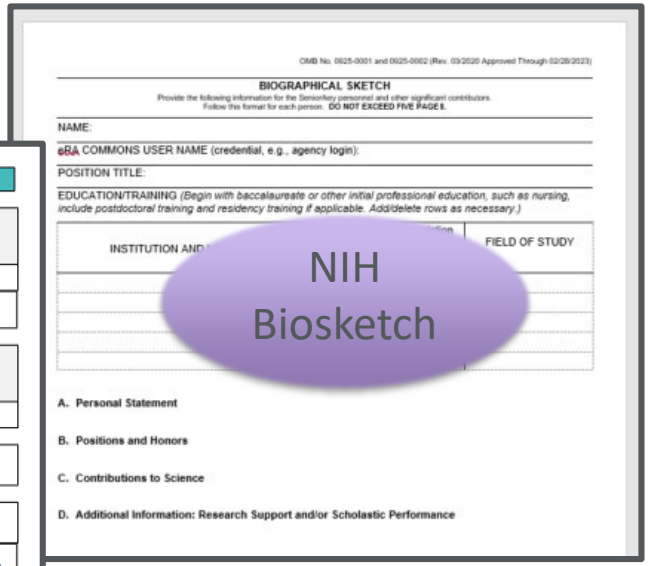
Proposed start da...
This date must be at ...

Administering organisation type
Select the relevant administering organisation type.

We welcome applications from academic, not-for-profit or commercial organisations based anywhere in the world but subject to eligibility checks. Contact grantenquiries@wellcome.org if you are unsure whether your organisation is eligible.

Name of administering organisation
If your application is successful, this is the organisation that will be responsible for administering the award (including receiving the funds).

Grant Application


OMB No. 0925-0001 and 0925-0002 (Rev. 03/2020 Approved Through 02/28/2023)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME:

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE:

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND ...	FIELD OF STUDY

A. Personal Statement

B. Positions and Honors

C. Contributions to Science

D. Additional Information: Research Support and/or Scholastic Performance

NIH Biosketch

Northwestern Medicine®
Feinberg School of Medicine

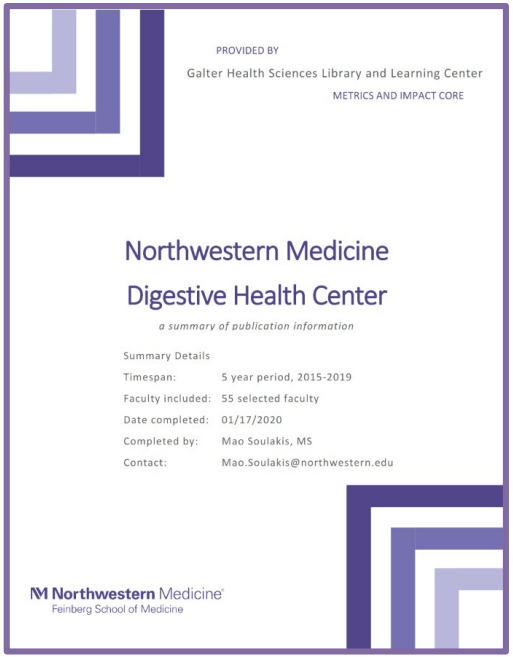
Metrics Support

Reports

The Metrics and Impact Core has created a suite of reports that can be generated for you, your team, or your department. These formalized reports capture and visualize productivity, contribution and dissemination of a body of work.

Reports include:

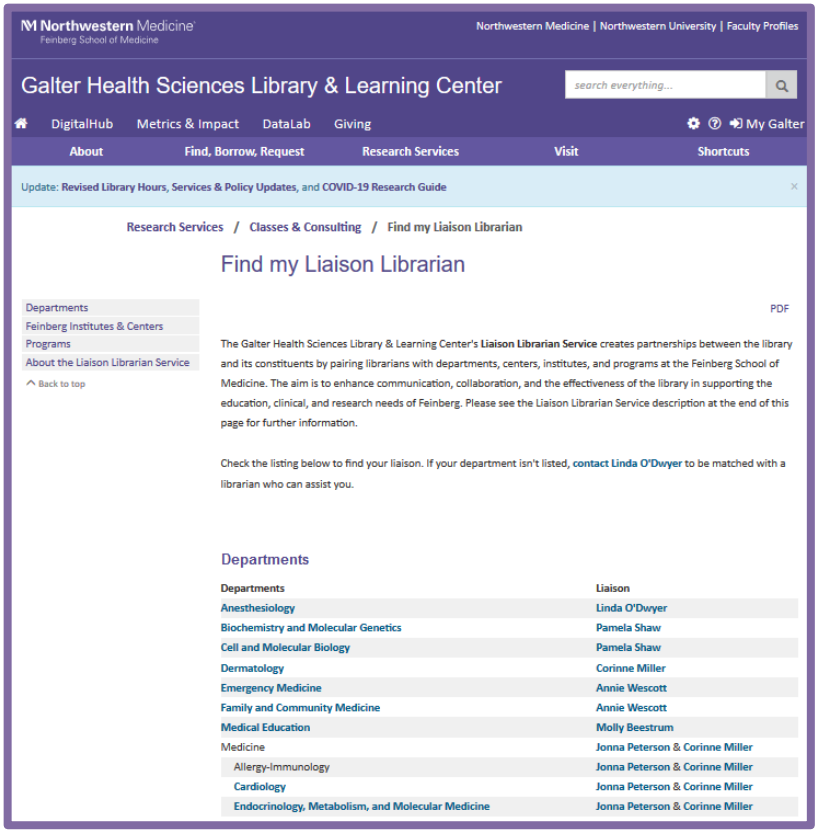
- Group Publication Metrics Report
- Funding Support Impact Statements
- Funding Support Bibliometric Networks
- Student or Trainee Publication Report
- Member Collaboration Report



Review

An annual NIH Biosketch Review is offered by your liaison librarian as well as members of the Metrics and Impact Core team.

To find your liaison librarian visit the Research Services guide on the library website. This site provides contact information of the liaisons of departments, institutes, centers and programs of the Feinberg School of Medicine.



Instruction

The staff at the Galter Health Sciences Library & Learning Center provide instruction on a wide array of library topics.

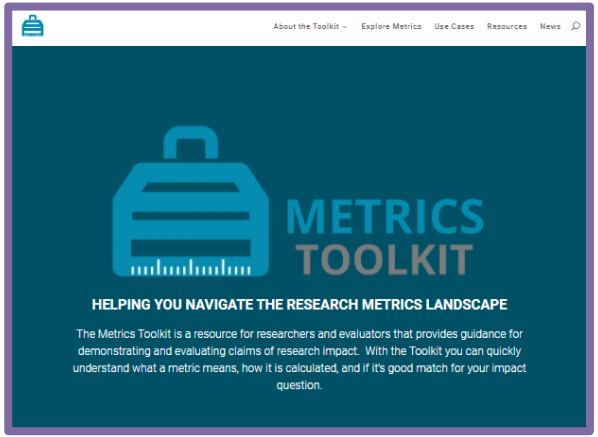
The Metrics and Impact Core is building out their course offerings and you can register for them on the Galter website.

Our team is also available to present on topics in your department meetings, either in person or virtually.

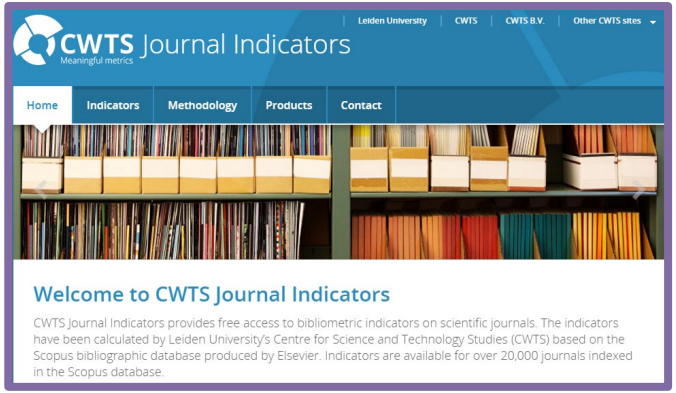
Northwestern Medicine®
Feinberg School of Medicine

Additional Information

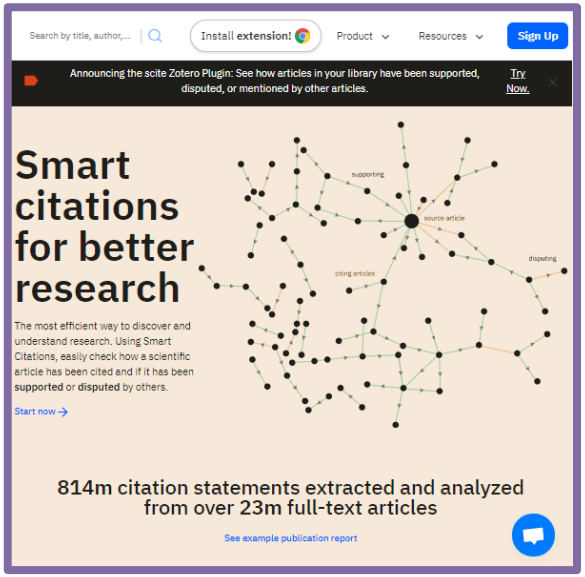
Other resources



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



https://www.journalindicators.com/



https://scite.ai/

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

Attributions:

The following attributions are for the icons and photos used in this presentation:

- Categories by Andi Nur Abdillah from the Noun Project
- Better by Flatart from the Noun Project
- Location by Najaya Design from the Noun Project
- Warning by priyanka from the Noun Project
- note by shashank singh from the Noun Project
- Five young people study at table with books and laptop for researching information for their project by Jacob Lund from Noun Project
- Highlighter by Creaticca Creative Agency from the Noun Project
- Thinking by Ahmed Sagarwala from the Noun Project
- Scientist by iconixar from the Noun Project
- Science Journal by Llisole from the Noun Project

References:

- Amjad, Rehmat. “Scientific Impact of an Author and Role of Self-Citations.” Scientometrics, vol. 122, no. 2, Springer, Feb. 2020, pp. 915–32, doi:10.1007/s11192-019-03334-2.
- Egghe, Leo. “Theory and Practise of the g-Index.” Scientometrics, vol. 69, no. 1, Springer Netherlands, Oct. 2006, pp. 131–52, doi:10.1007/s11192-006-0144-7.
- Glänzel, Thijs. “Productivity, Performance, Efficiency, impact—What Do We Measure Anyway?: Some Comments on the Paper ‘A Farewell to the MNCS and Like Size-Independent Indicators’ by Abramo and D’Angelo.” Journal of Informetrics, vol. 10, no. 2, Elsevier Ltd, May 2016, pp. 658–60, doi:10.1016/j.joi.2016.04.008.
- Halevi, Moed. “Suitability of Google Scholar as a Source of Scientific Information and as a Source of Data for Scientific evaluation—Review of the Literature.” Journal of Informetrics, vol. 11, no. 3, Elsevier Ltd, Aug. 2017, pp. 823–34, doi:10.1016/j.joi.2017.06.005.
- Hicks, Wouters. “Bibliometrics: The Leiden Manifesto for Research Metrics.” Nature (London), vol. 520, no. 7548, Apr. 2015, pp. 429–31, doi:10.1038/520429a.
- Hirsch, J. “An Index to Quantify an Individual’s Scientific Research Output.” Proceedings of the National Academy of Sciences - PNAS, vol. 102, no. 46, National Academy of Sciences, Nov. 2005, pp. 16569–72, doi:10.1073/pnas.0507655102.
- Martin, Irvine. “Assessing Basic Research: Some Partial Indicators of Scientific Progress in Radio Astronomy.” Research Policy, vol. 12, no. 2, Elsevier B.V, 1983, pp. 61–90, doi:10.1016/0048-7333(83)90005-7.
- Martín-Martín, Thelwall. “Google Scholar, Microsoft Academic, Scopus, Dimensions, Web of Science, and OpenCitations’ COCI: a Multidisciplinary Comparison of Coverage via Citations.” Scientometrics, Sept. 2020, pp. 1–36, doi:10.1007/s11192-020-03690-4.
- Purkayastha, Palmaro. “Comparison of Two Article-Level, Field-Independent Citation Metrics: Field-Weighted Citation Impact (FWCI) and Relative Citation Ratio (RCR).” Journal of Informetrics, vol. 13, no. 2, Elsevier Ltd, May 2019, pp. 635–42, doi:10.1016/j.joi.2019.03.012.
- 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.
- Teixeira da Silva, Jaime. “CiteScore: Advances, Evolution, Applications, and Limitations.” Publishing Research Quarterly, vol. 36, no. 3, Sept. 2020, pp. 459–68, doi:10.1007/s12109-020-09736-y.
- Waltman, v. (2018). Field normalization of scientometric indicators. https://arxiv.org/ftp/arxiv/papers/1801/1801.09985.pdf

Questions?

Annette Mendoza
Research Impact Librarian
Annette.Mendoza@northwestern.edu

Karen Gutzman
Head, Research Assessment and Communications
Karen.Gutzman@northwestern.edu