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REMS 2021 Lunch and Learn: Intro to Research Impact

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Introduction to Research Impact Metrics

June 24, 2021
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Link to these slides: https://bit.ly/3zPrwGx

What's a research impact librarian?

I empower scholars to create the conditions under which they can establish:

- A strong public identity
- An account of their contributions to the scholarly enterprise
- A persuasive body of evidence for the impact of their work

Email me at rwelzenb@umich.edu

I'm also "your" librarian!

For today:

- **What you might hear**: Familiarize you with terms, metrics you might encounter
- **What you should know**: Introduce some emerging issues in this space
- **What you can do next**: Point you to resources, tools, and support to learn more

Not for today:

- Memorizing how to calculate every imaginable research impact metric

What does "research impact" mean to you?

What terms, words, associations, or emotions does "research impact" bring up?

No single definition!

"The measurement of research impact is a contested research and political agenda that poses a complex academic question."

(Alla et al. "How do we define the policy impact of public health research? A systematic review" *Health Science Policy and Systems*, 2017)

No single definition!

- Only 23% of articles explicitly defined 'research impact'
- 76% of those definitions came from external agencies (e.g., funding bodies)

No single definition!

Four types of research impact definitions:

- as "the demonstrable contribution that excellent research makes to **society and the economy**"(the Research Councils United Kingdom)
- as "an effect on, change or benefit to the **economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia**" (the Higher Education Funding Council for England and the Research Excellence Framework)
- as measurable influences in the form of **quantifiable data such as citation frequency** (bibliometric definitions)
- as the influences of research results on the **knowledge and actions of researchers and policymakers** (use-based definitions).

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Four domains that underpinned the research impact concepts reviewed:

- *contribution* (the areas of research influence; e.g. economy, policies)
- *avenues* of impact (processes by which research could have impact; e.g. effects on knowledge, attitudes)
- *change* (synonyms used to describe "effects" or "benefits")
- *levels* of impact (e.g. national, international).

What you may hear...

- "What's the impact factor of that journal?"
- "My Google Scholar h-index is better than my Scopus h-index, so I'll use that one."
- "A high-impact article with 25 citations..."
- What's my Altmetric score?

What you may hear...

What entity is being measured?

- Journal
- Researcher
- ....Or something else?

Other key questions:

- How is the metric calculated?
- Is it *valid* (does it measure what it claims to measure?)
- Is it *transparent* and *reproducible*?
- Who "owns" this metric, and who has access to it?
- Is the application appropriate and meaningful? Is it fair and equitable?

Metrics for Journals

Example: Journal Impact Factor

New England Journal of Medicine 2019 JIF (InCites Journal Citation Reports)

Journal Impact Factor Calculation

$$\text{2019 Journal Impact Factor} = \frac{48,405}{648} = 74.699$$

How is Journal Impact Factor Calculated?

$$JIF = \frac{\text{Citations in 2019 to items published in } \mathbf{2017 (25,326)} + \mathbf{2018 (23,079)}}{\text{Number of citable items in } \mathbf{2017 (327)} + \mathbf{2018 (321)}} = \frac{48,405}{648}$$

Metrics for Journals

Example: Journal Impact Factor

- Created in 1960s to aid in library collection development
- Owned by Clarivate Analytics, based on the Web of Science journal index. Only journals indexed in Web of Science are eligible for a JIF.
- For 2019, the "Top" journal in Internal Medicine has a JIF of 74.699, in Organic Chemistry: 12.000, in Mathematics: 8.455

Metrics for Journals

Example: Journal Impact Factor

What issues do you see with the JIF?

Metrics for Journals

Example: Journal Impact Factor

What issues do you see with the JIF?

- Validity (different numerator and denominator)

- Effect of "Rockstar"/outlier articles

- Never intended as a proxy for quality--certainly not for articles

- Cannot be compared across disciplines

- Only available to journals in the WOS index

- Artificial precision?

Metrics for Journals

Other citation-based ways of measuring journal impact (with flaws of their own):

- SCImago Journal Rank
- Source-Normalized Impact per Paper (SNIP)

Other qualities to consider:

- Acceptance rate
- Quality of peer review
- Scope/Fit for your research
- Frequency of publication
- Openness
- Author-friendliness
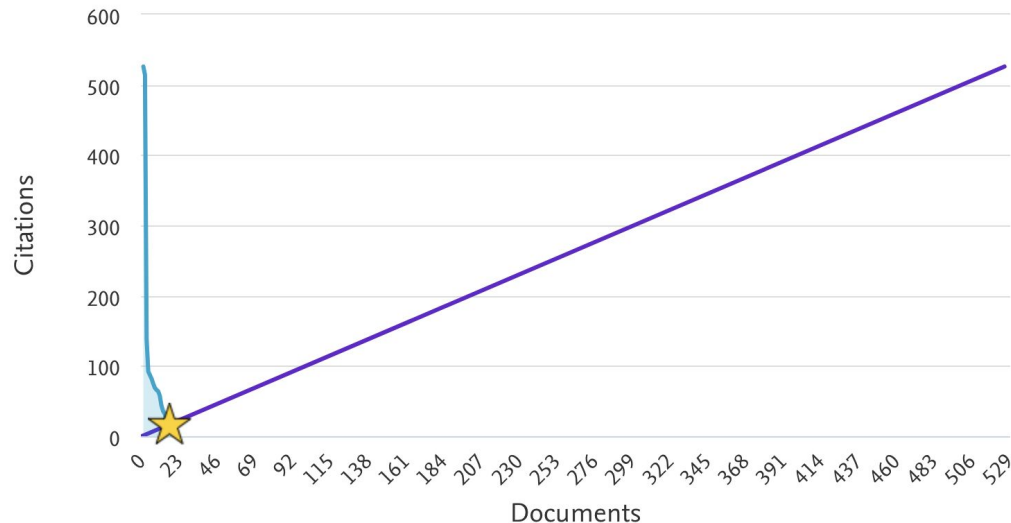- Costs to publish

Metrics for Researchers

Example: h-index

h-index is represented by the number of papers (h) with a citation number ≥ h (https://guides.lib.umich.edu/researchimpact/hindex)

This author's h-index

The h-index is based upon the number of documents and number of citations.

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Metrics for Researchers

Example: h-index

Other things to know about the h-index:
- Developed in 2005 by physicist Jorge Hirsch
- Intended to provide a composite measure of *productivity* and *impact*
- Depends on the source for publications (e.g., Scopus vs. Google Scholar)

Metrics for Researchers

Example: h-index

What issues do you see with the h-index?

Metrics for Researchers

Example: h-index

What issues do you see with the h-index?
- Prioritizes number of publications (productivity) over citations (impact): h-index can never be greater than your number of publications
- Different across sources
- Privileges a longer career (many publications + time to accrue citations)
- Cannot be compared across disciplines

Metrics for Researchers

Other metrics for researchers:

- Number of publications
- Author position (differs across fields)
- Grants (number or $$ awarded)

What other factors matter?

What you should know

- All of these metrics indicators have issues.

- The issues are well (if not widely) known

- Many ongoing discussions and debates are pushing to change the ways we think about research impact, and recognize and reward important scholarship.

What you should know

Alternative metrics

"the creation and study of new metrics based on the social web for analyzing, and informing scholarship." (Priem et al., altmetrics: a manifesto, 2010)
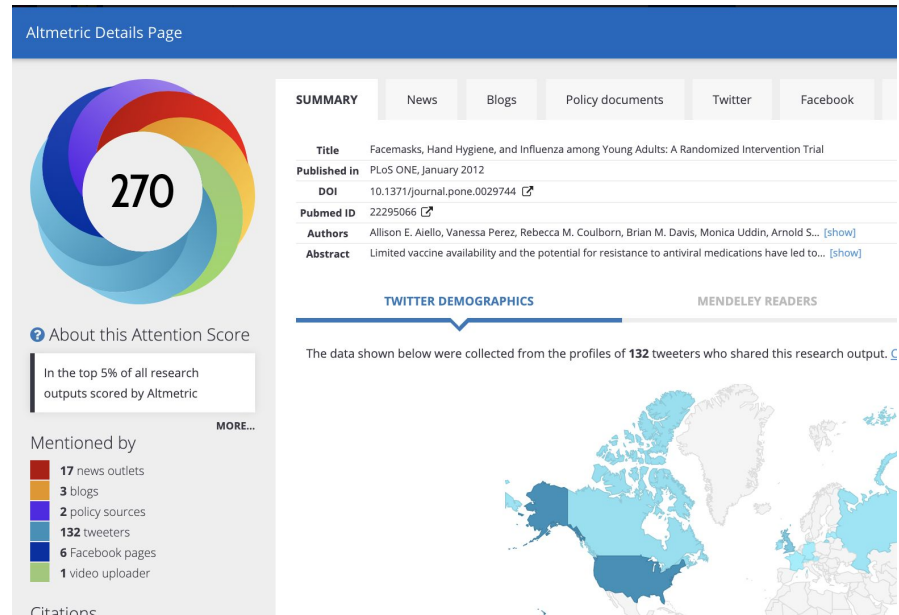
What you should know

AI + Research Impact

"Smart Citations allow users to see how a scientific paper has been cited by providing the context of the citation and a classification describing whether it provides supporting or disputing evidence for the cited claim" (scite.ai)

What you should know

Responsible Metrics

- [Leiden Manifesto](#)
- [San Francisco Declaration on Research Assessment (DORA)](#)
- [Examples of university responsible metrics statements](#)

Common themes:

- Combine expert, qualitative assessment w/ quantitative
- Use more than one metric
- Do not misuse metrics (e.g., JIF as a proxy for quality of an article)
- What would you include?

What you can do next

- [Metrics Toolkit](#): identify strengths, weaknesses, and context to find appropriate metrics

- [HuMetrics HSS:](#) consider other ways to think about the "impact" of a "scholarly life well lived" means and how that might be measured

- [SCOPE for research evaluation](#): a framework for a holistic, values-driven approach

- [Altmetrics for tenure, promotion, grant applications](#): a hands-on guide

That seems like a lot to think about on a Thursday afternoon.

I agree. Let's digest and talk more later.

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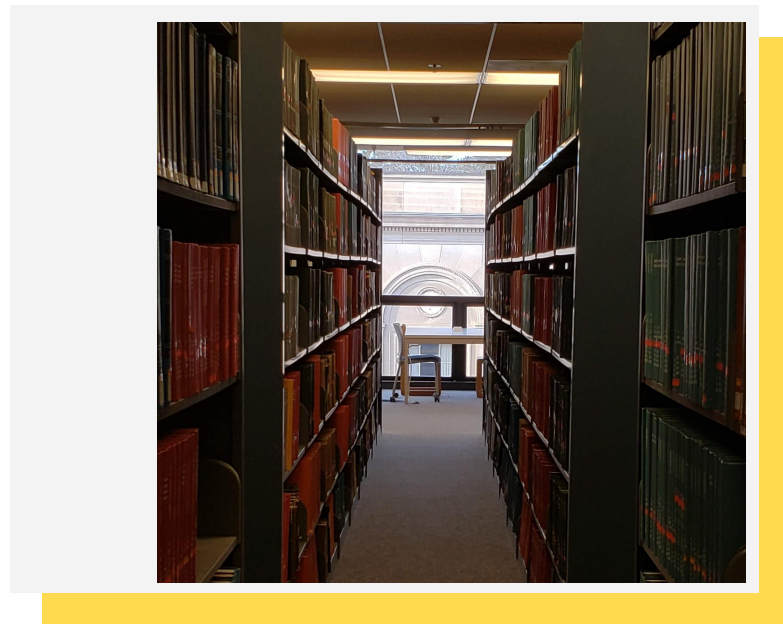
email me at rwelzenb@umich.edu
make an appointment: https://umich.libcal.com/appointments/rwelzenb

Additional resources

Research Guides:

- [Research Impact Assessment (Health Sciences)](#)
- [Research Impact Challenge Guide](#)
- [Altmetric & Altmetric Explorer for Institutions](#)

Thanks! And see you in the library....someday. (In the meantime, see you on Zoom!)