Altmetrics 101

In doing outreach on altmetrics, you're likely to encounter a number of questions and assumptions. Below, we've compiled some talking points in the hopes of making your outreach efforts a bit easier.

Basic concepts in altmetrics

What is research impact? *Impact* is when research has made a tangible difference in the world, whether upon the public or other scholars. For example, "impact upon the public" might be when research on how the Zika virus spreads is used by governments to decide the best way to respond to the epidemic in their countries. "Impact upon other researchers" might be when a study rules out certain approaches to testing for the Zika virus, allowing other researchers to pursue other testing options.

How can metrics showcase impact? Some metrics are direct *measures* of impact (for example, the number of governments using a proposed health intervention). More often, metrics are an *indicator* of impact (for example, the number times public policy documents cite an article that proposes an intervention). These indicators have to be examined in depth to find the true *evidence* of impact (i.e. the citations that clearly state that a government plans to put an intervention into action).

What else can metrics help us understand? Metrics can also simply be *measures* of attention, with no tangible link to impact (for example, the number of readers that an article receives).

"Altmetrics" are not the same thing as "Altmetric": *altmetrics* is a type of data that helps people understand how scholarship is discussed online. *Altmetric* (aka Altmetric.com) is a company founded in 2011, and is one of several services that report upon altmetrics.

Altmetrics are *complements* for traditional metrics, not *replacements*: altmetrics have several advantages over citations; they're quicker to accumulate, they document non-scholarly attention and impacts, and they can be used to track the attention for non-traditional research outputs. However, they can't tell us anything about the quality of the research. Citations are a useful indication of traditional scholarly impact, whereas altmetrics can tell us about public impact, and can occasionally predict later citations. You need both kinds of metrics to get the full picture of research impact.

A majority of research doesn't have attention online--and that's OK: It's likely just not being discussed on the sites that altmetrics aggregators track, like more than 80% of other research online.

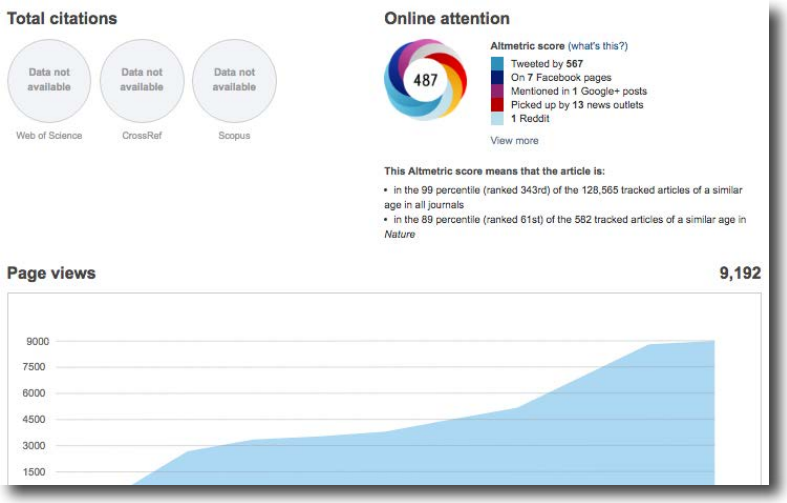
Altmetrics are great for tracking the attention for datasets, software packages, and other non-traditional research outputs. Altmetrics can prove just how valuable research software, data, and other outputs are to other scholars, policymakers, and members of the public. For example, take the metrics for this script; Depsy shows that hundreds of other people worldwide need it run their own software. *That's* influential! And now its creators can get the credit they deserve.

Altmetrics can also help authors learn how their traditional research (articles and books) are making an impact outside of academia. altmetrics as evidence of the public discussion, sharing, and use of scholarship includes:

- Measuring the influence of research upon climate change public policy;
- Understanding public reception for history research via Goodreads ratings
- Discussion in "trade" books, as understood via Google Books citations

Altmetrics are about more than public or societal impacts; they also help us to learn about newer scholarly uses of research, too: researchers do more than just cite articles: they save books to their reference libraries (creating Mendeley and CiteULike readership numbers); they adapt others' data (GitHub forks) and use it in their own analyses (data citations); and so on. Altmetrics are traces of these "alternative" scholarly activities ("alternative" only in that we can now measure what we were not able to measure before).

The value of altmetrics is primarily in the qualitative data that they can surface: It's widely acknowledged that simple counts--whether of citations, readers, downloads, or tweets--can't tell a person much about how *research is actually used and regarded*. Raw metrics can't distinguish between a citation to research that celebrates or refutes a previous finding; nor between the number of Mendeley readers that save an article but never read it versus those who go on to cite it; nor between software that's downloaded by a student for a class assignment versus a researcher who uses it for important analyses. However, the presence of metrics can serve as a signal that there's the *potential for impact* evidenced in the underlying qualitative data. Think of metrics as the smoke that signals the potential for (impact) fire. While metrics in isolation can be good indicators of simple *attention*, you need to dig much deeper to truly understand research's *impacts*.



Nature use citation data, usage data and Altmetric data to understand how their research is being used and shared online.

Frequently Asked Questions

Altmetrics, ALMs, usage statistics, social media metrics: what's the difference?

- Altmetrics are any data sourced from the Internet that tells us who is discussing research online, how often they're doing it, and in what contexts. For example, Twitter debates about an academic book, citations to research in policy documents, and post-publication peer reviews of articles are all types of altmetrics. There is no defined set of metrics that comprise altmetrics, but some researchers and policymakers have argued for the need for pre-defined "baskets of metrics" that can help altmetrics novices understand certain types of impact.
- Usage statistics are downloads, pageviews, session length, and other server log data that can tell us how many people visited an article or other output online, how long they stayed on the article's page, and whether or not they saved it to their computer.
- Article-level metrics (or output-level metrics) are any metrics for a piece of research at the article (or output) level. They include usage statistics, altmetrics, and even citations to an article, book, dataset, or other research output. They do not include journal impact factors (a journal-level metric) or the h-index (a researcher-level metric).
- The above metrics are all distinct from social media metrics, which are a way of understanding one's success at online engagement. Types of social media metrics include: the number of Facebook likes a *non-research-related* post receives; one's number of Twitter followers; or the number of YouTube views one receives for non-research-related videos. Notice a theme here? Altmetrics generally track metrics (including social media metrics) related to discrete research outputs; social media metrics relate to pretty much anything else.

Aren't altmetrics easy to game? Not if you're using the right tool to find them. The best altmetrics tools tend to a) employ anti-gaming strategies to get the cleanest data only and b) downplay numbers in favor of highlighting who's saying what about research. Tools that make qualitative data front-and-center make it easy to spot "gamed" metrics like excessive self-tweeting, spammy blog posts, etc.

What about negative tweets/citations? They're not a big of a problem as you might assume. Research has shown that only a minority of tweets (0.9%) and citations (5-14%) are negative in nature. More often, items are discussed and cited online in a less informative way: Twitter users might simply share an article's link alongside a relevant hashtag, and citations are often "perfunctory" in nature. That's why metrics don't matter as much as who's saying what about research online.

Why do you want to replace the impact factor/citations/peer review with altmetrics? Altmetrics aren't about replacing anything; instead, they're a good supplement to the gaps in understanding research impact that the impact factor, citations, and peer review leave behind.

I heard altmetrics are all about Twitter and Facebook, and I don't care about social media. Social media makes up only a small part of altmetrics. Citations to research in policy documents, post-publication peer reviews, and expert recommendations and ratings of research in Faculty of 1000 Prime are other types of altmetrics that many researchers find very useful for understanding the true impacts of their research.

How can you possibly measure impact on clinical practice? This can be done by understanding how practitioners put research into practice. Proxy data for understanding that include: readership on PubMed Central (where many practitioners access research) and citations to research in public health policy documents, manuals, and more (where recommendations for interventions, etc are often made).

What about impact on public policy? That's possible to track via citations to research that appear in public policy documents. Altmetric tracks these citations for a number of government and NGO policy bodies.

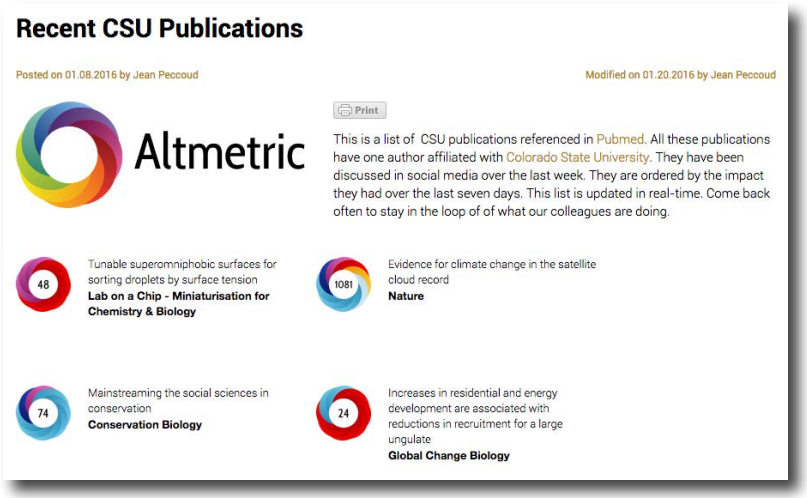
What about impact on education? Citations to research in syllabi is just one type of altmetric that can inform one's impact upon education. However, no altmetrics aggregator includes these metrics--yet.

When will there be standards for altmetrics? The National Information Standards Organization (NISO) is currently working on a set of standards and best practices for altmetrics. For more information please visit their website.

You can't quantify scientific quality; many great papers are not highly cited. We agree that quality is best judged by reading scholarship and making a personal judgement call. But there are a number of well-respected expert peer review sites (including Faculty of 1000 Prime, Pubpeer, and Publons) that crowdsource such judgements.

What are tenure and promotion committees doing about altmetrics? A small but growing number of universities and departments are beginning to include altmetrics in their tenure & promotion dossier preparation guidelines as one example of the many types of data that researchers can use to document their influence. And even at universities that do not explicitly mention altmetrics in their guidelines, researchers are successfully documenting their impacts using altmetrics.

Do you have any good examples of altmetrics making a difference? Sure! Why not have a look at one of our researcher-focused blog posts for some great examples of how data-savvy researchers have used the data to monitor and showcase the conversations around their research.



Jean Peccoud has grouped the Altmetric data on his site in different ways, depending on what his site visitors are looking to find. One filter shows which research topics are "trending" in biotechnology, while another filter shows only the publications associated with Jean's ORCID profile.