Beyond traditional impact: what can altmetrics do for you?

Euan Adie, altmetric.com

Oxford, 14th November 2013
Value all research products

A new funding policy by the US National Science Foundation represents a sea-change in how researchers are evaluated, says Heather Piwowar.

What a difference a word makes. For all new grant applications from 1 January, the US National Science Foundation (NSF) asks a principal investigator to list his or her research "products" rather than "publications" in the biographical sketch section. This means, according to the NSF, a scientist's impact is not dependent solely on publications; data sets, software and other non-traditional research products will count too.

There are more diverse research output than ever before. Scientists are creating and releasing better tools to do their workflow, and checking each other in."
Several different tools available
What are “altmetrics”?

- “alternative metrics”

- new ways of measuring different, non-traditional forms of impact, potentially of non-traditional outputs.

- “alternative to only using citations”, not “alternative to citations”.

- complementary to traditional citation-based analysis.
Every researcher is a communicator

**Within academia**
- Presentations and seminars
- Funding and ethics applications
- Academic books
- *Journal articles* and posters
- Term papers and essays
- Meetings and conferences
- Correspondence

**Within society**
- Speaking at public events
- Books for general audiences
- Press
- Social media
- Blogs
- Policy documents

We should measure both
New perspectives of impact

**ACADEMIC IMPACT**
- Journal Impact Factor
- Citation counts

**SOCIETAL IMPACT**
- Download counts
- Page views
- Mentions in news reports
- Mentions in social media
- Mentions in blogs
- Reference manager readers
  ... etc.

**Traditional metrics**

**Alternative metrics**
“altmetrics”
What does Altmetric do?

- Measures online attention surrounding journal articles and datasets.
- Collects and delivers altmetrics to institutions, publishers and funders.
- Users include Wellcome Trust, Cell Press, NPG and repositories at LSE, Purdue and more.
How does Altmetric measure attention?

- We follow a specific list of sources from all over the web.
- From these sources, we collect any mentions that contain links to papers.
- We collate the attention paid to different versions of the same paper.
- Our users see the raw metrics and the actual conversations they make up the numbers.
The biological impacts of the Fukushima nuclear accident on the pale grass blue butterfly

Score in context

Atomkatastrophe: Forscher entdecken Fukushima-Mutationen
Der Spiegel
Die Augen deformiert, die Flügel geschraubt: Der Atomunfall von Fukushima hat offenbar das Erbgut von Tieren geschädigt. Forscher..

Dopo Fukushima, le farfalle non hanno più le ali
Corriere della Sera
I risultati dello studio di un'equipe giapponese sulle Zizeeria: anomalie genetiche e fisiologiche dopo le radiazioni..

Fukushima butterflies 'abnormal'
BBC
Exposure to radioactive material released into the environment has caused mutations in butterflies found in Japan, a study sugge..

Mentioned by

1859 tweeters
122 Facebook users
1 LinkedIn posts
10 news outlets
3 Pinners
4 science blogs
9 Google+ users
8 Reddit threads
Where are the readers?

Geographical breakdown

Who are the readers?

Tweeter demographics

<table>
<thead>
<tr>
<th>Type</th>
<th>Count</th>
<th>As %</th>
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<tbody>
<tr>
<td>Members of the public</td>
<td>1700</td>
<td>77%</td>
</tr>
<tr>
<td>Scientists</td>
<td>414</td>
<td>18%</td>
</tr>
<tr>
<td>Practitioners (doctors, other health professionals)</td>
<td>20</td>
<td>0%</td>
</tr>
<tr>
<td>Science communicators (journalists, bloggers, editors)</td>
<td>54</td>
<td>2%</td>
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</table>
What’s interesting about this kind of data?
The quantitative aspect of altmetrics is still in its infancy.
Altmetrics tools don’t (yet) provide good metrics for impact

BUT

They can help you find evidence of impact, successes
Evidence of public outreach?

An article on the ecological impacts of the Fukushima nuclear accident.

- > 1,859 twitter accounts shared, combined follower count of 2.5M.
- 68% of tweets sent from Japan.
- 77% of tweets from members of the public.

Figure 1 2012, Scientific Reports 2, 570
A different example, from the USP

Creatine Supplementation in Fibromyalgia: A Randomized, Double-Blind, Placebo-Controlled Trial†

Christiano R. R. Alves‡, Bianca M. Santiago‡, Fernanda R. Lima, Maria C. G. Otaduy, Ana Luisa Calich, Aline C. C. Tritto, Ana Lúcia de Sá Pinto, Hamilton Roschel, Cláudia C. Leite, Fabiana B. Benatti, Eloisa Bonfá, Bruno Gualano*

Article first published online: 26 AUG 2013
DOI: 10.1002/acr.22020

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Nice work from USP: Creatine in fibromyalgia: A double-blind, randomized, placebo-controlled trial (ncbi.nlm.nih.gov/pubmed/2355428...)

8:50 PM - 8 Apr 13
Supplement builds strength in fibromyalgia trial

Chicago Tribune

Creatine, a supplement favored by bodybuilders, modestly boosted muscle strength in patients with fibromyalgia, Brazilian resear ..

2013-05-03T21:54:00+01:00
Evidence research has reached patients?

On Pubmed: Creatine supplementation in fibromyalgia: A double-blind, randomized, placebo-... tinyurl.com/cmndpuq #fibro #fibromyalgia
Industry Use of Evidence to Influence Alcohol Policy: A Case Study of Submissions to the 2008 Scottish Government Consultation

Jim McCambridge, Ben Hawkins, Chris Holden

Summary Points

› We examine how research evidence is used in alcohol industry submissions made to a Scottish Government consultation in 2008 to advocate policies in line with their commercial interests.

› Industry actors consistently oppose the approaches found in research to be most likely to be effective at a population level without actually engaging with the research literature in any depth.
PLOS ALM Reports: An exploratory review
Engagement/Influence beyond citations

Industry Use of Evidence to Influence Alcohol Policy: A Case Study of Submissions to the 2008 Scottish Government Consultation
Jim McCambridge, Ben Hawkins, Chris Holden
Research Article | published 23 Apr 2013 | PLOS Medicine
10.1371/journal.pmed.1001431

Show all ALMs

<table>
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<th>Viewed</th>
<th>Saved</th>
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<tbody>
<tr>
<td>PLOS views</td>
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<tr>
<td>PLOS PDF downloads</td>
<td>Mendeley 5</td>
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<td>PLOS XML downloads</td>
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<td>PMC views</td>
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<tr>
<td>Total usage</td>
<td>5,079</td>
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<table>
<thead>
<tr>
<th>Discussed</th>
<th>Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twitter</td>
<td>PubMed Central</td>
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</table>

- No citations in 3 months since publication.
- However Twitter mentions 70x the average article in our dataset.
- 4x the average for PLOS Medicine articles in 2013.
Engagement/Influence beyond citations

C_Stihler_MEP @perricex2 now commenting on today's article exposing tactics of alcohol industry. Link beneath http://t.co/88r2Wdje9K
Apr 24, 2013

bermaninstitute #PLOSMedicine: Industry Use of Evidence to Influence Alcohol Policy: Case Study of Submissions to 2008 Scottish Govt
http://t.co/woxOupWlp
Apr 24, 2013

RTaylor_MEP #LSHTM publishes article suggesting #alcohol industry submissions on #Scottish alcohol policy are misleading:
http://t.co/zEsYTFqWJ4
Apr 24, 2013

MaraaskaRovers "@veitchemma: Alcohol industry influence on policy. http://t.co/4dB7RuYhkd @plosmedicine" As expected comparable to tobacco industry.
Apr 24, 2013

veitchemma Alcohol industry influence on policy: misrepresented strong evidence and promoted weak evidence. http://t.co/WWszV5MLEw @plosmedicine
Apr 24, 2013

andy_rowell Big Alcohol. Bad Habits: RT@PLOSMedicine: Drinks industry attempted to influence Scottish Government's alcohol policy
http://t.co/nxbAv9DMks
Apr 24, 2013

IOGTint RT @SCPHRP: MT @PLOSMedicine Drinks industry attempted to influence Scottish Government's alcohol policy
http://t.co/CsFKU1wkhW #bigalcohol
Jun 3, 2013

SojiAdew as shaken and stirred. @PLOSMedicine: Drinks industry attempted to influence Scottish Government's #alcohol policy
http://t.co/na8QSdLx3"
Apr 24, 2013
# Monitoring progress: WT’s key indicators

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Key indicators of progress</th>
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<tbody>
<tr>
<td>Discoveries</td>
<td>1. significant advances in the generation of new knowledge</td>
</tr>
<tr>
<td></td>
<td>2. contribute to discoveries with tangible impacts on health</td>
</tr>
<tr>
<td>Applications</td>
<td>3. contribute to the development of enabling technologies, products and devices</td>
</tr>
<tr>
<td></td>
<td>4. uptake of research into policy and practice</td>
</tr>
<tr>
<td>Engagement</td>
<td>5. enhanced level of informed debate in biomedicine</td>
</tr>
<tr>
<td></td>
<td>6. significant engagement of key audiences &amp; increased reach</td>
</tr>
<tr>
<td>Research leaders</td>
<td>7. develop a cadre of research leaders</td>
</tr>
<tr>
<td></td>
<td>8. evidence of significant career progression among those we support</td>
</tr>
<tr>
<td>Research environment</td>
<td>9. key contributions to the creation, development and maintenance of major research resources</td>
</tr>
<tr>
<td></td>
<td>10. contributions to the growth of centres of excellence</td>
</tr>
<tr>
<td>Influence</td>
<td>11. significant impact on science funding &amp; policy developments</td>
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<tr>
<td></td>
<td>12. significant impact on global research priorities and processes</td>
</tr>
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</table>
Why score at all? To allow ranking
Quantifying attention

Altmetric score 364
Note that we can measure attention, but...

Positive?
Negative?
For scientific reasons?
Or because the title is funny?
Is 364 good or bad anyway?
Fast food hamburgers: what are we really eating?

The Altmetric score is one measure of the quality and quantity of online attention that this article has received. Read about how Altmetric scores are calculated here.

This article scored 127.40

The context below was calculated when this article was last mentioned on 5th July 2013.

Compared to all articles in Annals of Diagnostic Pathology

So far Altmetric has tracked 54 articles from this journal. They typically receive a little less attention than average, with a mean score of 2.0 vs the global average of 3.8. This article has done particularly well, scoring higher than 99% of its peers. It's actually the highest scoring article in this journal that we've seen so far.

All articles of a similar age

Older articles will score higher simply because they've had more time to accumulate mentions. To account for age we can compare this score to the 19,608 tracked articles that were published within six weeks on either side of this one in any journal. This article has done particularly well, scoring higher than 99% of its contemporaries.

Other articles of a similar age in Annals of Diagnostic Pathology

We're also able to compare this article to 2 articles from the same journal and published within six weeks on either side of this one. This article has scored higher than all of them.

All articles

More generally, Altmetric has tracked 1,349,492 articles across all journals so far. Compared to these this article has done particularly well and is in the 99th percentile. It's in the top 5% of all articles ever tracked by Altmetric.
In general, altmetrics numbers…

- Don’t represent the quality of research.
- Don’t indicate the quality of individual researchers.
- Don’t tell the whole story – always look for qualitative data as well.
What should we be measuring beyond attention?
Question for the academic community.
Gaming the system
Gaming?

• Alice asks her friends to retweet her.
Gaming?

- Bob likes Alice’s paper. He shares it with all his friends and asks them to retweet him.
Gaming?

- Alice pays $5 for 100 retweets
Four types of suspicious attention
Microcystis Aeruginosa and Underwater Light Attenuation in a Hypertrophic Lake (Hartbeespoort Dam, South Africa)

So far Altmetric has seen 34 tweets from 1 accounts.

- Hartbeespoort Dam (@Hartbeespoort Dam)
  193 followers
  I am 97.588% full. Microcystis aeruginosa and underwater light attenuation in a hypertrophic... http://t.co/Nl3up8AfU0 #harties
  23-Mar-2013

- Hartbeespoort Dam (@Harties_dam)
  193 followers
  I am 98.984% full. Microcystis aeruginosa and underwater light attenuation in a hypertrophic... http://t.co/3RyYnhha #harties
  08-Feb-2013

- Hartbeespoort Dam (@Harties_dam)
  193 followers
  I am 97.610% full. Microcystis aeruginosa and underwater light attenuation in a hypertrophic... http://t.co/3RyYnhha #harties
  14-Feb-2013

- Hartbeespoort Dam (@Harties_dam)
  193 followers
  I am 97.074% full. Microcystis aeruginosa and underwater light attenuation in a hypertrophic... http://t.co/3RyYnhha #harties
  15-Feb-2013
What can be done?

• Make actual mentions visible
• Only track sources that can be audited
• Try to automatically flag suspicious activity, then do human curation
http://am.ascb.org/dora/
Thanks for listening!

E-mail: euan@altmetric.com
Twitter: @altmetric
Website: altmetric.com