What Article-Level Metrics can do for you

Martin Fenner

http://www.flickr.com/photos/financialaidpodcast/7195300768/
Should a publisher know what happens with a research article after publication?

No, our editors and reviewers know what is good science and our job ends with the publication of the paper.

Yes, we want to know how the science we publish is read, discussed, cited, and reused.
And is the journal as a filter enough or do we need additional tools post-publication?
PLOS ONE publishes too many papers to work as a filter for discovery or evaluation
### PLOS ONE articles by selected subject areas

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Count</th>
</tr>
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<tbody>
<tr>
<td>Genetics and Genomics</td>
<td>12,483</td>
</tr>
<tr>
<td>Cell Biology</td>
<td>8,261</td>
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<tr>
<td>Neuroscience</td>
<td>8,088</td>
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<td>Infectious Diseases</td>
<td>7,484</td>
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<td>Computational Biology</td>
<td>6,984</td>
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<tr>
<td>Oncology</td>
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<tr>
<td>Evolutionary Biology</td>
<td>4,788</td>
</tr>
<tr>
<td>Ecology</td>
<td>4,031</td>
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</table>

From 48,439 PLOS ONE articles published until November 8, 2012
Journal-based metrics correlate poorly with individual articles

Number of Scopus citations for all 4405 PLoS ONE papers published in 2009. Data collected November 8, 2012. Median is 9 citations, 10% of papers have at least 29 citations.
PLOS ONE is not a second-tier journal

Combined Scopus citation counts for all PLOS Biology and PLOS Medicine articles published in 2009, as well as top 200 PLOS ONE articles in 2009

- 4341 (PLOS Biology, Median 15.5)
- 3263 (PLOS Medicine, Median 11)
- 8849 (PLOS ONE, Median 51.5)

Citation counts collected November 8, 2012
Article-level metrics add granularity to journal-based metrics

Usage
- PLOS Journals (HTML, PDF, XML)
- PubMed Central (HTML, PDF)

Citations
- CrossRef
- Scopus
- Web of Science
- PubMed Central

Social Web
- PLOS Comments
- Mendeley
- CiteULike
- ResearchBlogging
- Facebook
- Twitter
- Wikipedia

PLOS is collecting and displaying ALM since 2009
Proportion of articles covered by source


- Wikipedia: 6%
- Twitter: 13%
- Facebook: 27%
- Research Blogging: 2%
- PLoS Comments: 12%
- CiteULike: 25%
- Mendeley: 71%
- PubMed Citations: 49%
- Scopus: 62%
- CrossRef: 63%
- PMC HTML Views: 98%
- PLoS HTML Views: 100%
Citations are only a small fraction of how a paper is reused


- 150,825,519 HTML pageviews
- 374,958 CrossRef citations
- 40,740,077 PDF downloads

0.25%
Most articles are accessed from the PLOS website

- PLOS Website: 124,985,344
  - HTML
  - PDF

- PubMed Central: 25,840,175
  - HTML
  - PDF

- Institutional Repositories: ?
Dimensions of article-level metrics

What
- citations
- usage
- social web
- other

When
- days after publication
- years after publication
- at specific timepoints

Who
- scholars
- public
- people you know

Aggregation
- by journal
- by author
- by institution
- by funder
What do article-level metrics measure?

- Impact
- Attention
- Self-Promotion
PLOS Medicine Articles August 2011 to August 2012

Combined HTML views and PDF downloads (PLOS website) for articles published between 08/16/11 and 08/15/12. Bubble size correlates with Scopus citations, bubble color with article type. Data collected 08/24/12.

Total Views

PLOS Articles from the Big Food collection

Tweets vs. HTML views at PLOS for articles in the Big Food collection. Circle size correlates with Facebook activity.
Data collected August 19, 2012.
Tweets about Big Food Collection

Data collected August 19, 2012.
PLOS Medicine Articles August 2011 to August 2012

Combined HTML views and PDF downloads (PLOS website) for articles published between 08/16/11 and 08/15/12. Bubble size correlates with Scopus citations, bubble color with article type. Data collected 08/24/12.

Total Views

Neonatal Mortality Levels for 193 Countries in 2009 with Trends since 1990: A Systematic Analysis of Progress, Projections, and Priorities

Article Usage

Total Article Views **28,846**
Aug 30, 2011 (publication date) through Dec 3, 2012

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<th>Platform</th>
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<th>PDF Downloads</th>
<th>XML Downloads</th>
<th>Totals</th>
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</table>

14.01% of article views led to PDF downloads

*Although we update our data on a daily basis, there may be a 48-hour delay before the most recent numbers are available. PMC data is posted on a monthly basis and will be made available once received.

Citations

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Social Networks

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<td>Twitter</td>
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</table>
Citation counts for 2009 PLOS Biology papers


Scopus

\[ R^2 = 0.87 \]
Citations to this article as recorded by CrossRef

Neonatal Mortality Levels for 193 Countries in 2009 with Trends since 1990: A Systematic Analysis of Progress, Projections, and Priorities


1. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000

2. The neonate: a community’s moral compass?
   Isaacs D, Kent A

3. Preventing Maternal and Newborn Deaths Globally
   Obstetrics & Gynecology 2012 120(3): 636. doi:10.1097/AOG.0b013e318263cc1

   Health Policy and Planning 2012 27(suppl 3): iii104. doi:10.1093/heapolicy/czs045

5. Newborn survival in Bangladesh: a decade of change and future implications
   Health Policy and Planning 2012 27(suppl 3): iii40. doi:10.1093/heapolicy/czs044

6. China's progress in neonatal mortality
   Bassani D, Roth D

7. Reducing maternal, newborn, and infant mortality globally: An integrated action agenda
   Bhutta Z, Cabral S, Chan C, Keenan W
PLOS Search is a discovery tool that can sort results based on article-level metrics.
Identify Open Access articles published by PLOS, funded by the European Commission Seventh Framework Programme (FP7)

Match articles with grant numbers

Show the impact of these publications

PLOS Search API
2562 Articles

CORDIS
1166 Articles
What users do with PLOS OpenAIRE papers
Article-Level Metrics for 1,166 PLOS OpenAIRE papers. Metrics collected November 8, 2012. HTML pageviews and PDF downloads from PLoS journals website.

1,903,172 HTML pageviews

472,985 PDF downloads

14,059 Mendeley bookmarks

6,211 Facebook mentions

4,886 CrossRef citations

772 Wikipedia mentions
Author locations from the ENGAGE project

First authors (blue) and last authors (green).

European Network for Genetic and Genomic Epidemiology
Total views are combined HTML views and PDF downloads from the PLOS website. Bubble size correlates with Scopus citations, and bubble color with the PLOS journal. Data collected September 19, 2012.
PLOS Publications from the EU–funded ENGAGE Project

Total views are combined HTML views and PDF downloads from the PLOS website. Bubble size correlates with Mendeley bookmarks, and bubble color with the PLOS journal. Data collected September 19, 2012.

Total Views

Mendeley

Months
Genome-Wide Association Scan Meta-Analysis Identifies Three Loci Influencing Adiposity and Fat Distribution

Article Usage

Total Article Views
17,549
Jun 26, 2009 (publication date) through Nov 20, 2012

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32.12\% of article views led to PDF downloads

Citations

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<td>Google Scholar</td>
<td>Search</td>
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Social Networks

citeulike 4
Mendeley 54