

Article-Level Metrics at PLOS

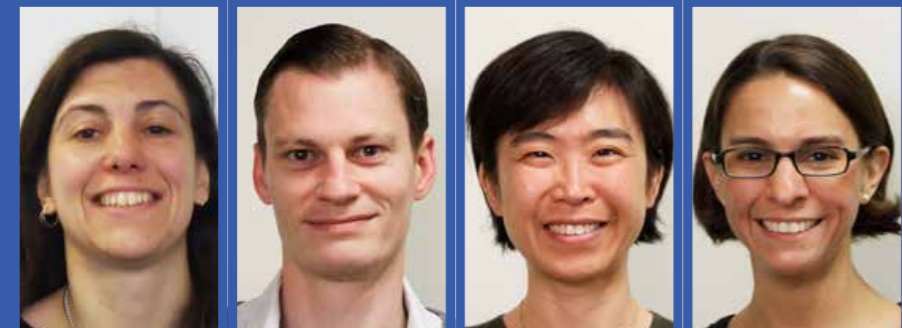
Martin Fenner



 **PLOS** | **Open for Discovery**

50,000 articles and counting

We mark another milestone in our mission to transform research communication.



Altmetrics is the creation and study of new metrics based on the Social Web for analyzing, and informing scholarship.

Altmetrics Manifesto

<http://altmetrics.org/about/>

Post-publication peer review
is the process whereby
scientific studies are absorbed
into the body of knowledge.

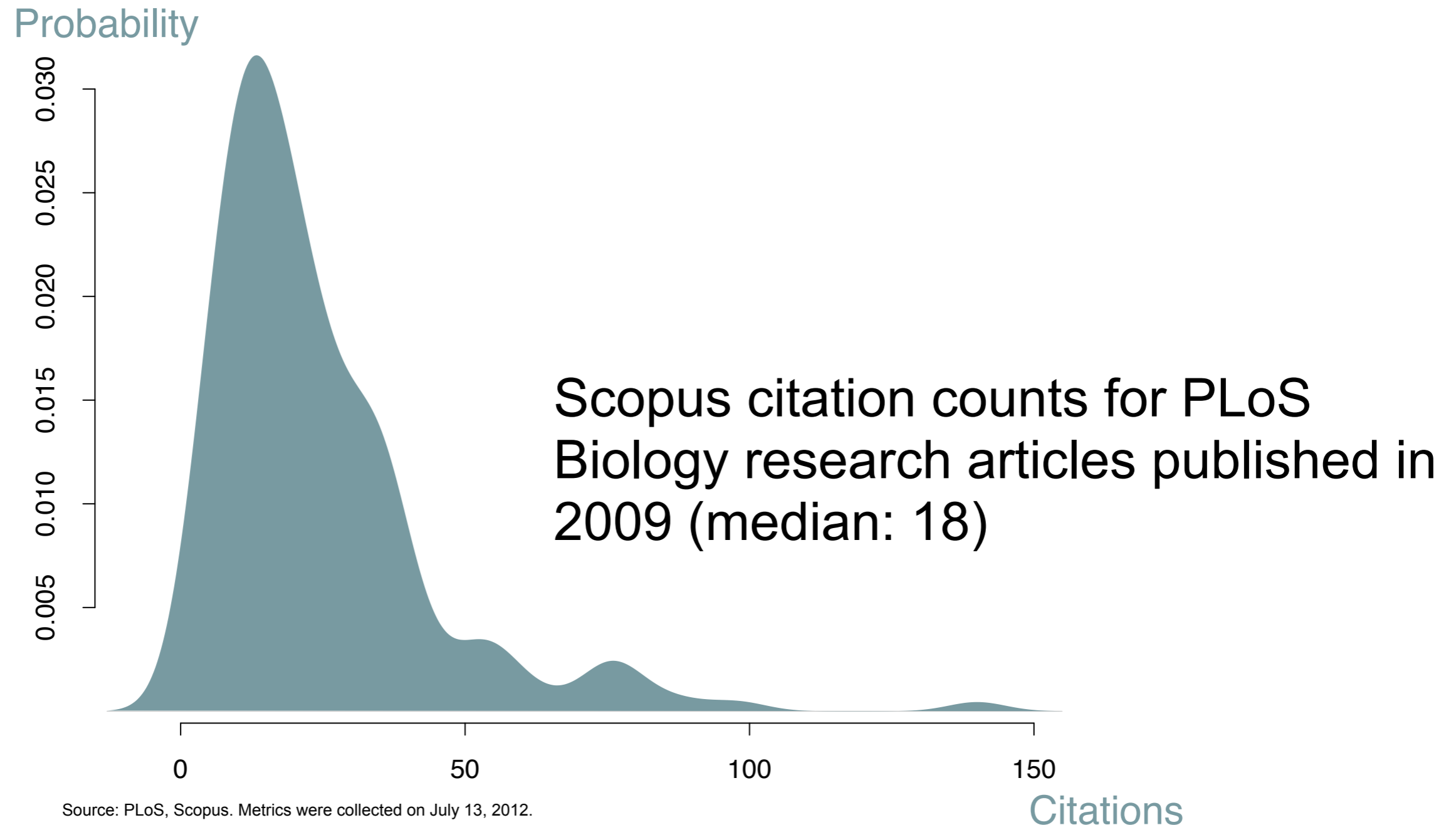
Richard Smith

[http://blogs.bmj.com/bmj/2011/04/06/
richard-smith-what-is-post-publication-
peer-review/](http://blogs.bmj.com/bmj/2011/04/06/richard-smith-what-is-post-publication-peer-review/)

Article-Level Metrics (ALM) are a comprehensive and multi-dimensional suite of transparent and established metrics at the article level.

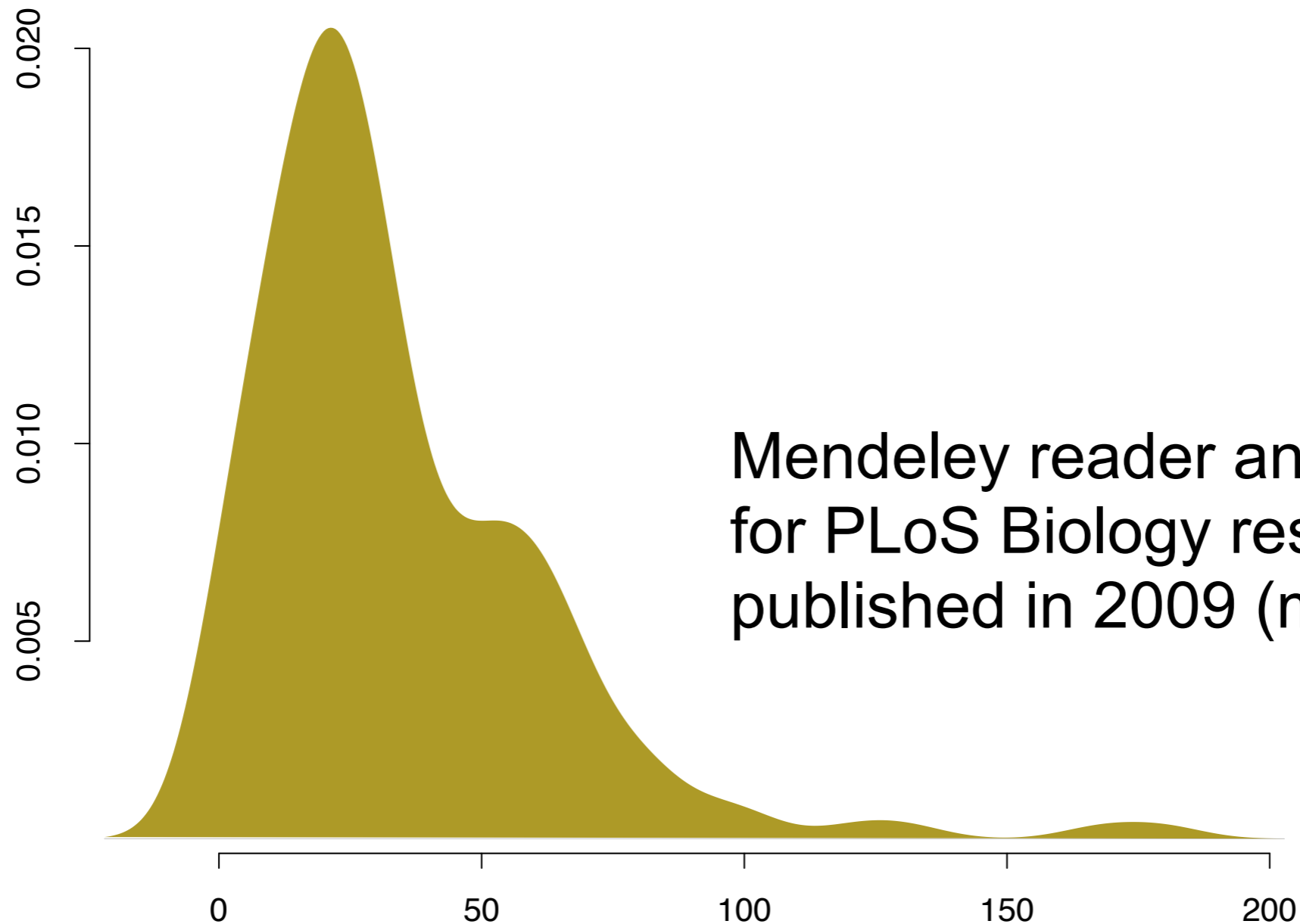
<http://article-level-metrics.plos.org/alm-info/>

Journal-based metrics correlate poorly with individual articles



Social web activity also varies greatly between articles

Probability



Source: PLoS, Mendeley. Metrics were collected on July 13, 2012.

Mendeley Bookmarks

The PLoS Article-Level Metrics project started in 2009 and tracks usage, citations and social web activity for all PLoS articles.

Usage

PLoS Journal Site
(HTML, PDF, XML)

PubMed Central
(abstract, fulltext,
PDF, figures)

Citations

CrossRef

Scopus

Web of Science

PubMed Central

Wikipedia

Social Web

Mendeley

CiteULike

Facebook

Twitter

Research Blogging

PLoS Comments

1034 Articles

[+ New](#)

[Hunter-Gatherer Energetics and Human Obesity](#)

July 25, 2012 | 3 sources

[New Dromaeosaurids \(Dinosauria: Theropoda\) from the Lower Cretaceous of Utah, and the Evolution of the Dromaeosaurid Tail](#)

May 15, 2012 | 4 sources

[Research Blogs and the Discussion of Scholarly Information](#)

May 11, 2012 | 5 sources

[How Academic Biologists and Physicists View Science Outreach](#)

May 9, 2012 | 5 sources

[Circular Permutation in Proteins](#)

March 29, 2012 | 3 sources

[Key Issue: Collective Action for the Open Researcher & Contributor ID \(ORCID\)](#)

November 1, 2011 | 1 source

[Design, Synthesis, and Biological Evaluation of Chromone-Based p38 MAP Kinase Inhibitors](#)

October 27, 2011 | 2 sources

[A comparison of empathic communication pattern for teenagers and older people in online support communities](#)

September 1, 2011 | 3 sources

[Who Shares? Who Doesn't? Factors Associated with Openly Archiving Raw Research Data](#)

July 13, 2011 | 5 sources

[Semantic Annotation of Images on Flickr](#)

July 12, 2011 | 0 sources

[Investigation of hypoxia and carbonic anhydrase IX expression in a renal cell carcinoma xenograft model with oxygen tension measurements and 124I-cG250 PET/CT](#)

July 1, 2011 | 0 sources

New Dromaeosaurids (Dinosauria: Theropoda) from the Lower Cretaceous of Utah, and the Evolution of the Dromaeosaurid Tail

[Edit](#) [Delete](#)

Publication Date May 15, 2012

DOI [10.1371/journal.pone.0036790](https://doi.org/10.1371/journal.pone.0036790)

PubMed ID [22615813](https://pubmed.ncbi.nlm.nih.gov/22615813/)

[CiteULike](#) (2), updated 09/10/12 04:33am UTC

[Wikipedia](#) (19), updated 09/10/12 10:39am UTC

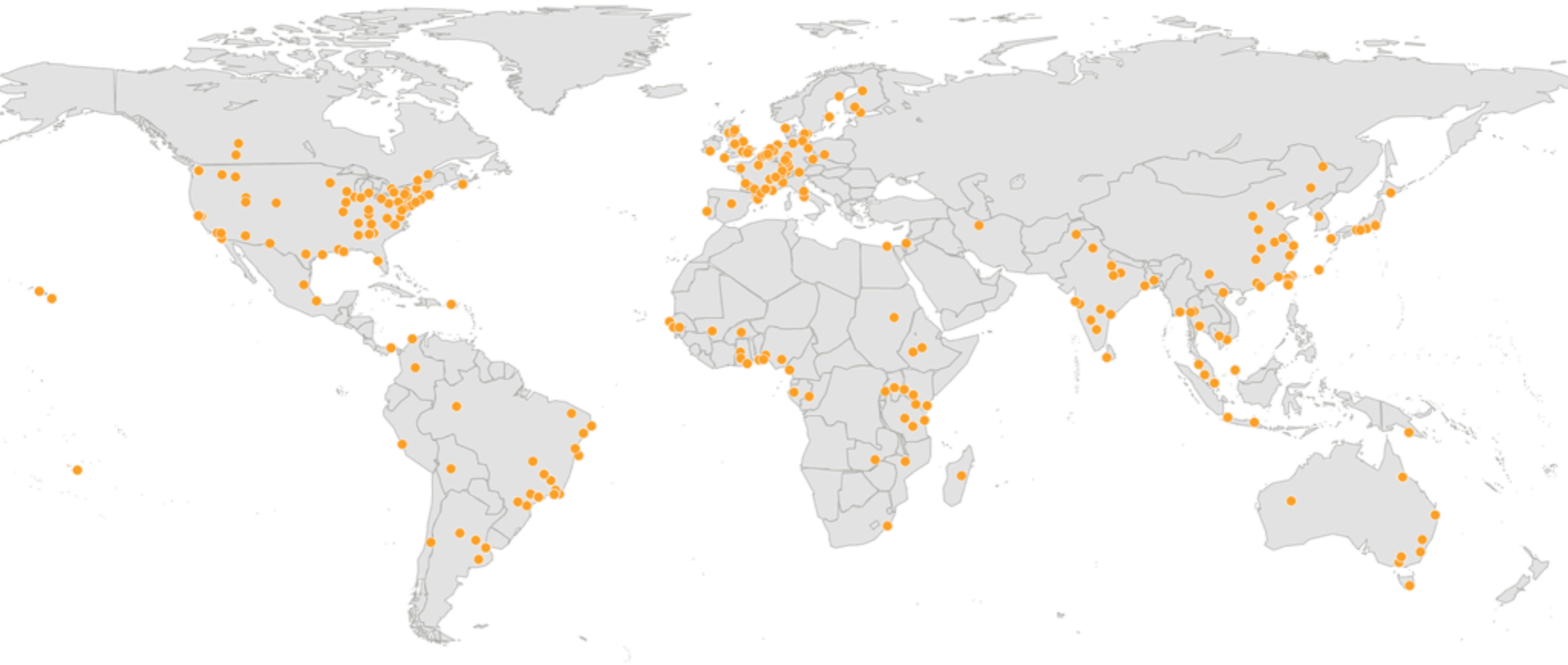
[Mendeley](#) (13, 79188720-a5c0-11e1-909c-0024e8453de6), updated 09/10/12 01:33pm UTC

[Facebook](#) (164, <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0036790>), updated 09/10/12 02:49pm UTC

- {"url"=>"http://dx.doi.org/10.1371/journal.pone.0036790", "normalized_url"=>"http://dx.doi.org/10.1371/journal.pone.0036790", "share_count"=>0, "like_count"=>0, "comment_count"=>0, "total_count"=>0, "click_count"=>0, "comments_fbid"=>nil, "commentsbox_count"=>0}
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[Facebook](#)

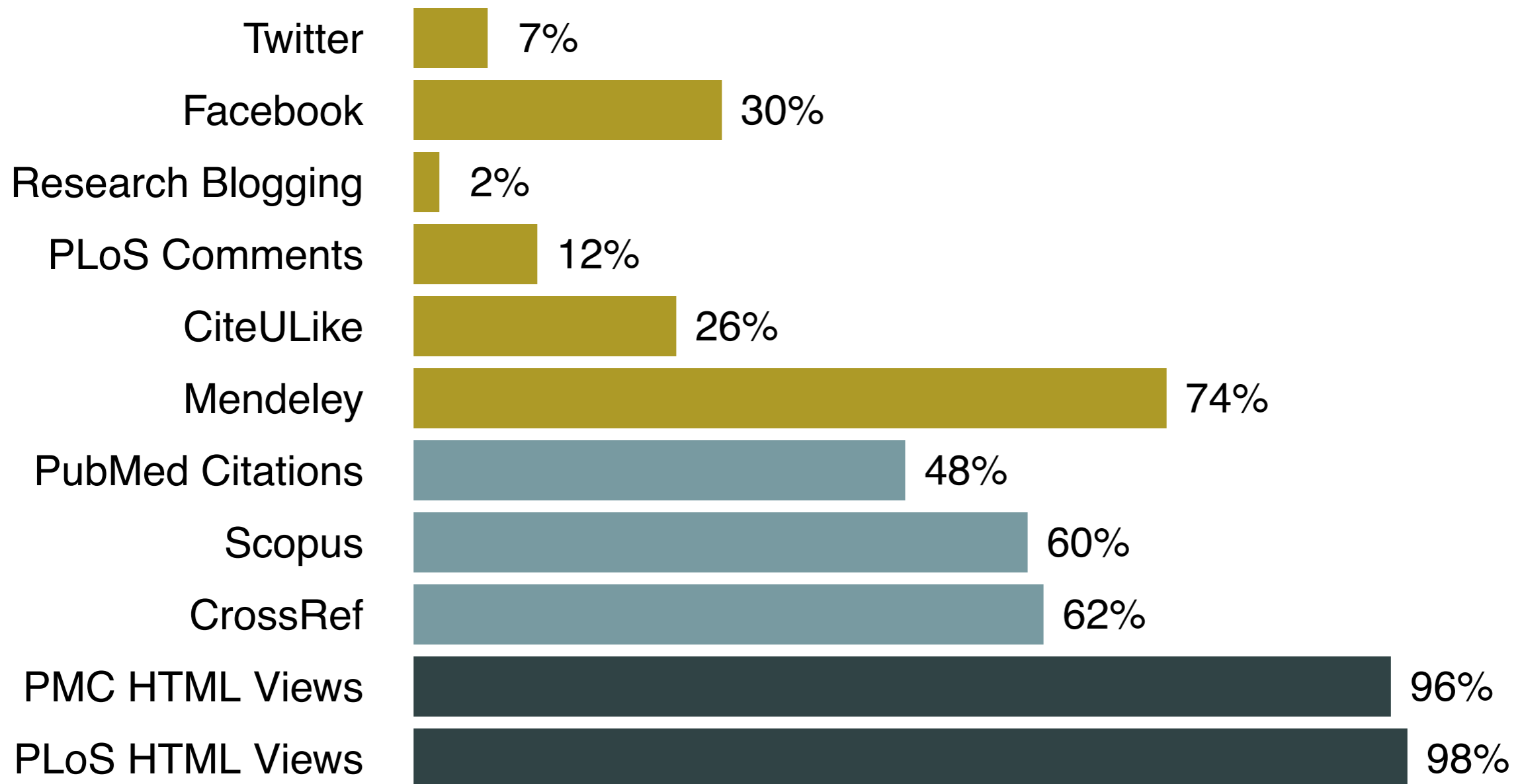
Location of First Authors of 684 PLOS ONE Papers



Search for tropical medicine papers

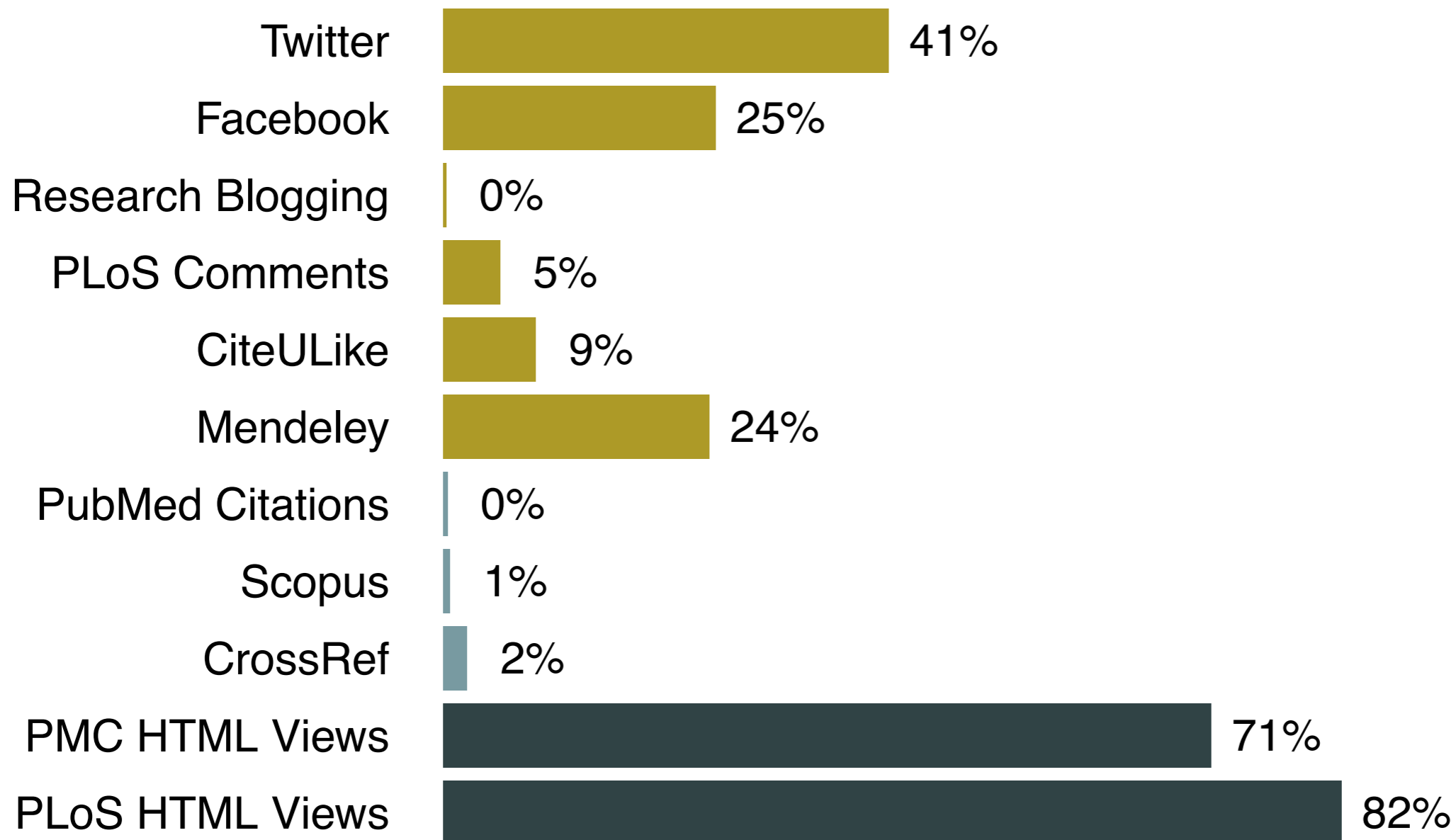
Proportion of articles covered by source

Metrics for 57,527 PLoS journal articles published until August 8, 2012.



Proportion of articles covered by source

Metrics for 7,489 PLoS journal articles published May 8 until August 8, 2012.



What users do with PLOS papers

Article-Level Metrics for 57,527 PLoS papers published until August 8, 2012.
HTML pageviews and PDF downloads from PLoS journals website.

108,872,370 HTML pageviews

24,670,713 PDF downloads

331,946 CrossRef citations

HTML



PDF

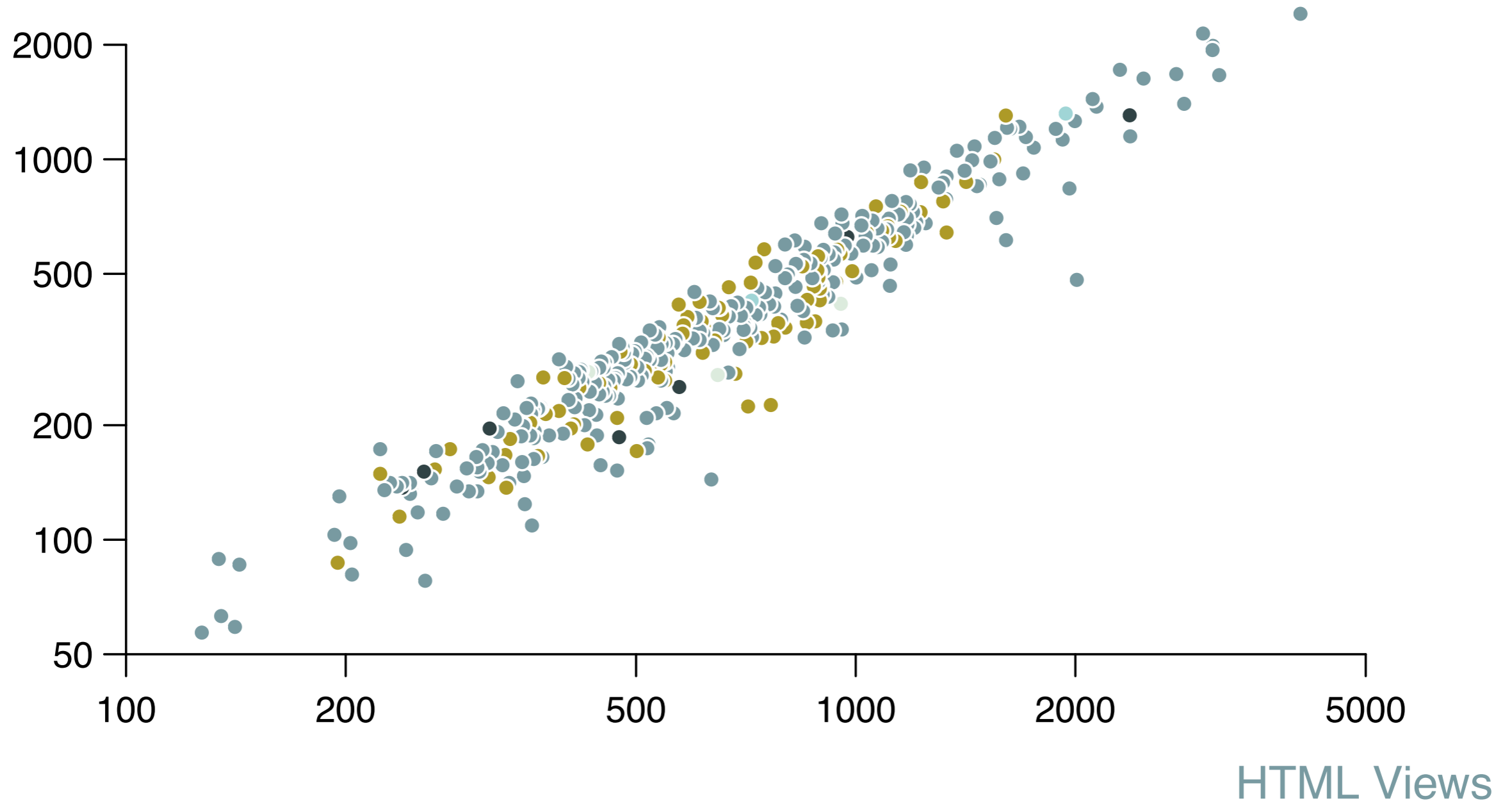


Citation

HTML views correlate with PDF downloads

Usage data from PubMed Central for all 384 PLoS articles in the subject category Cancer Genetics. Log-log scale. Colors represent journals (PLoS ONE blue, PLoS Genetics green).

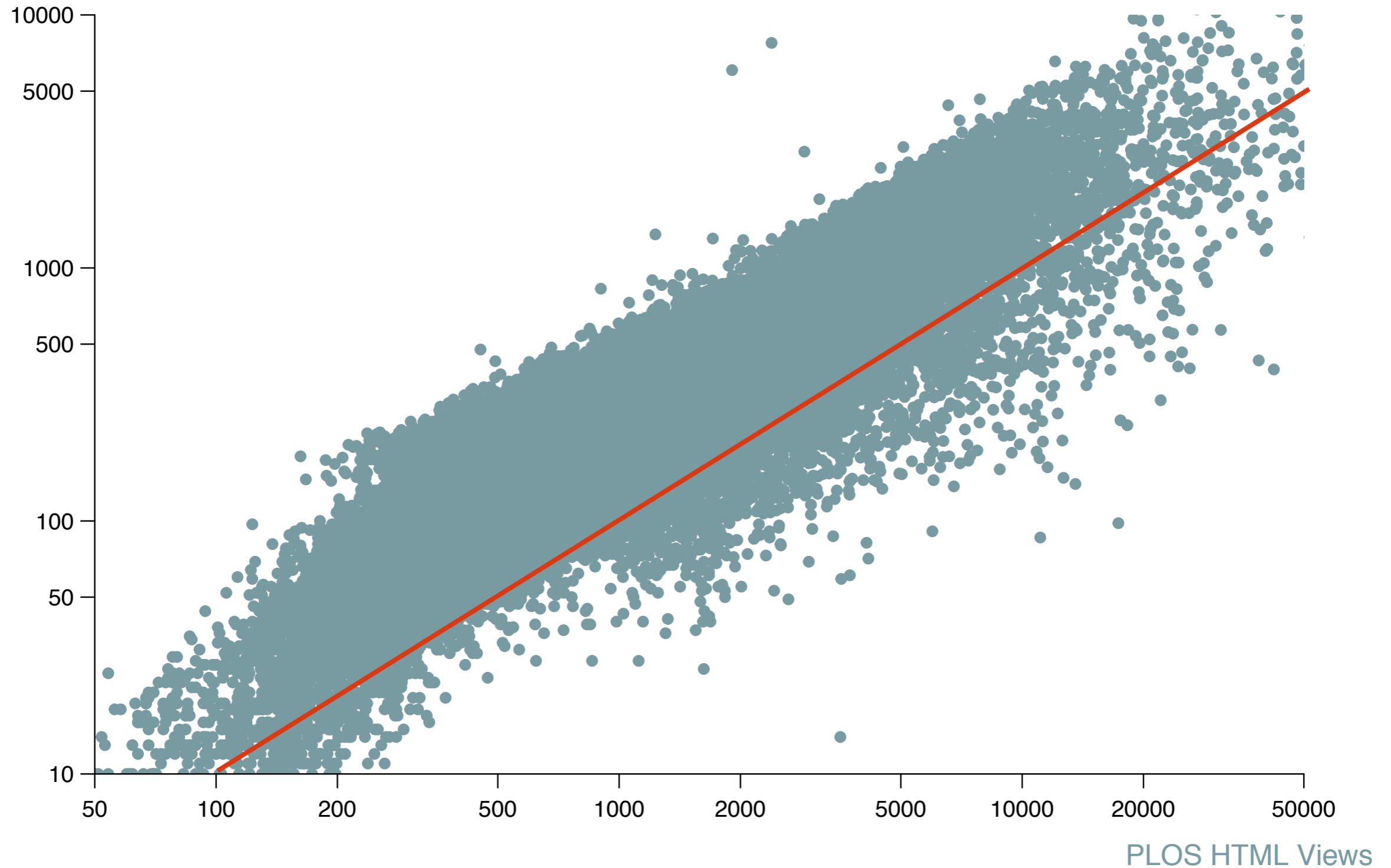
PDF Downloads



HTML pageviews correlate with PDF downloads

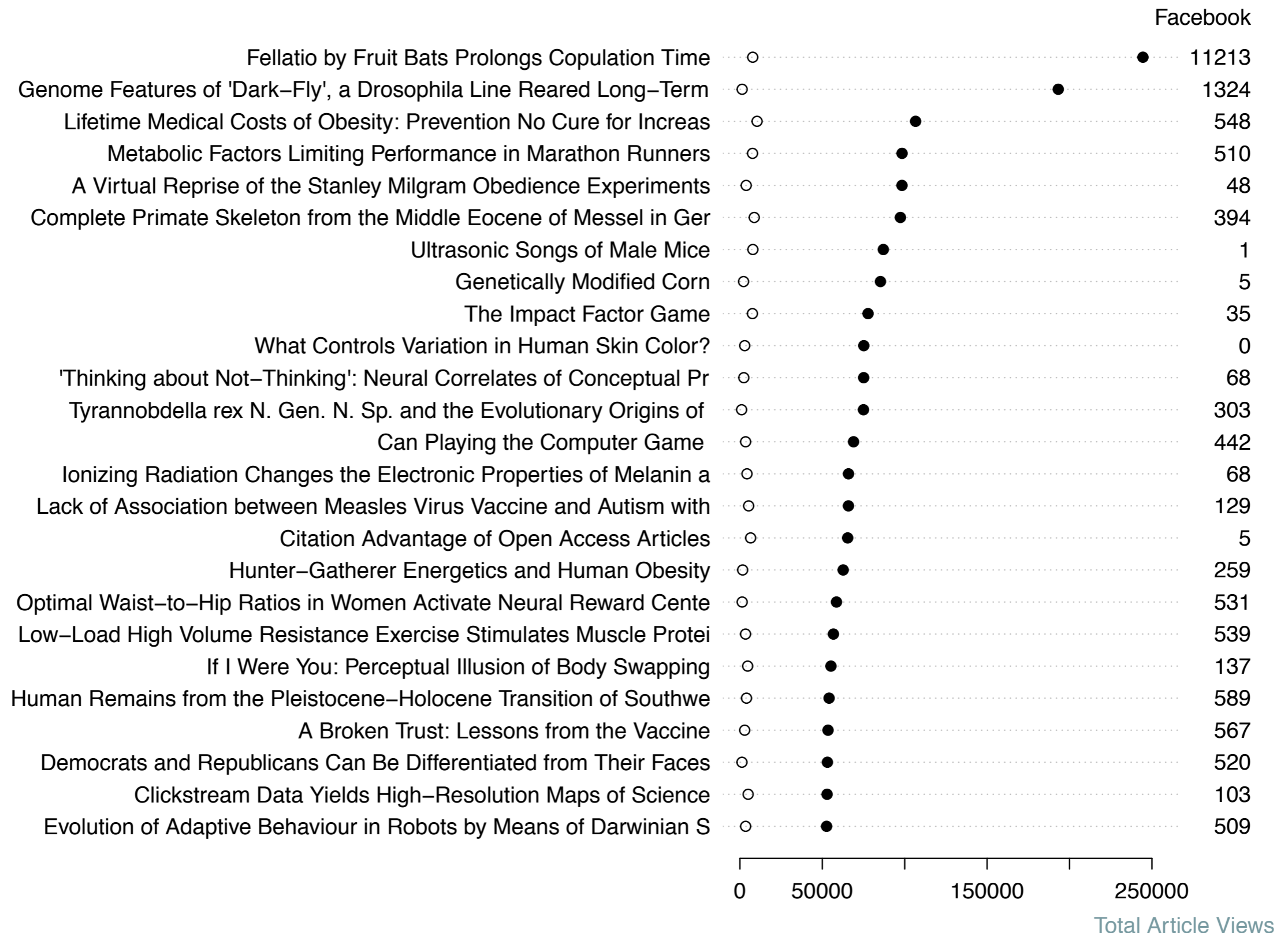
Usage data from the PLoS website for 56,208 PLoS articles. Data collected August 8, 2012. Log-log scale.

PLOS PDF Downloads

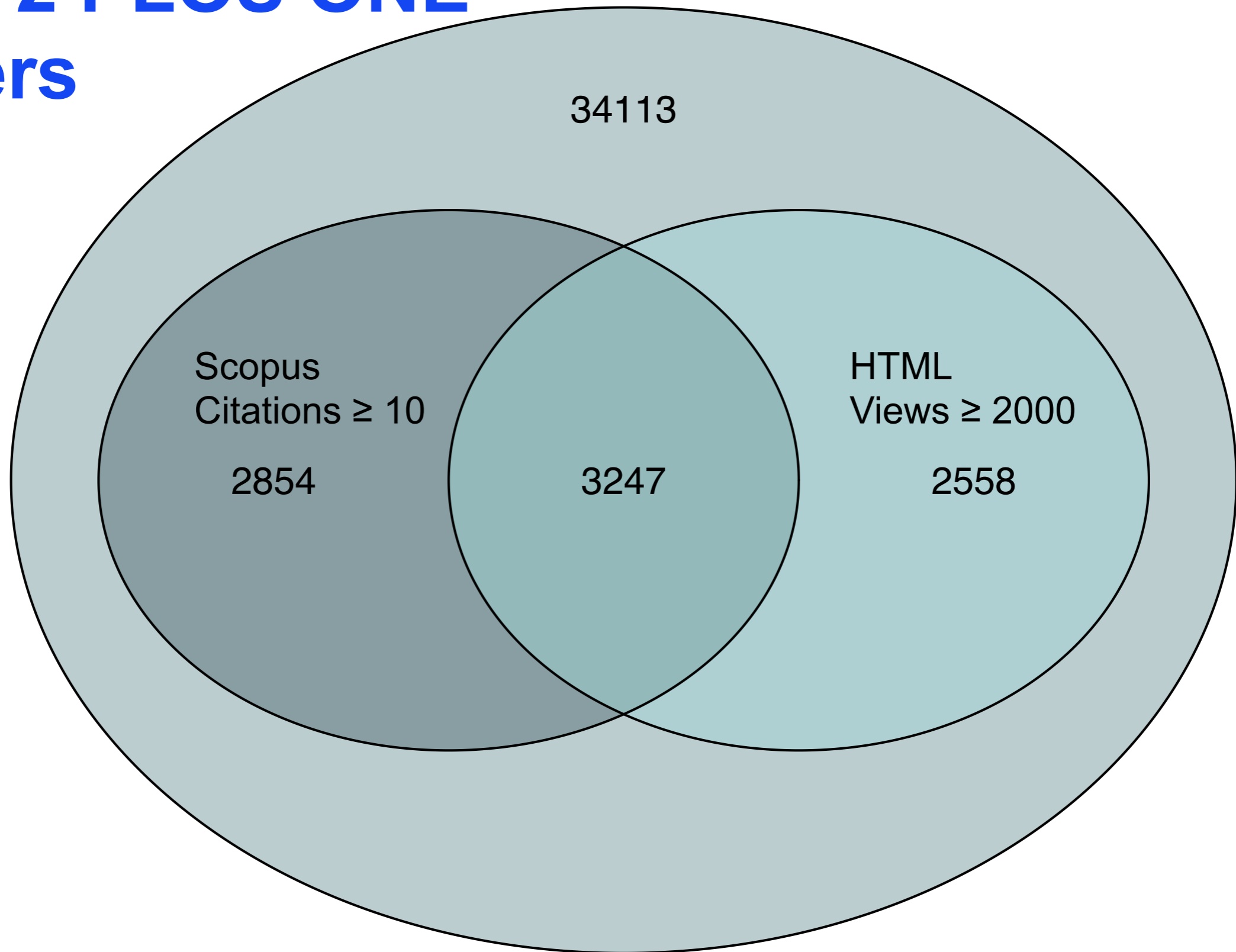


Finding popular science articles

Out of all 2578 PLOS articles with a HTML/PDF ratio > 10, the 25 most popular PLOS articles by number of HTML views were selected. Facebook Likes/Shares/Comments are also displayed. Data collected August 8, 2012.



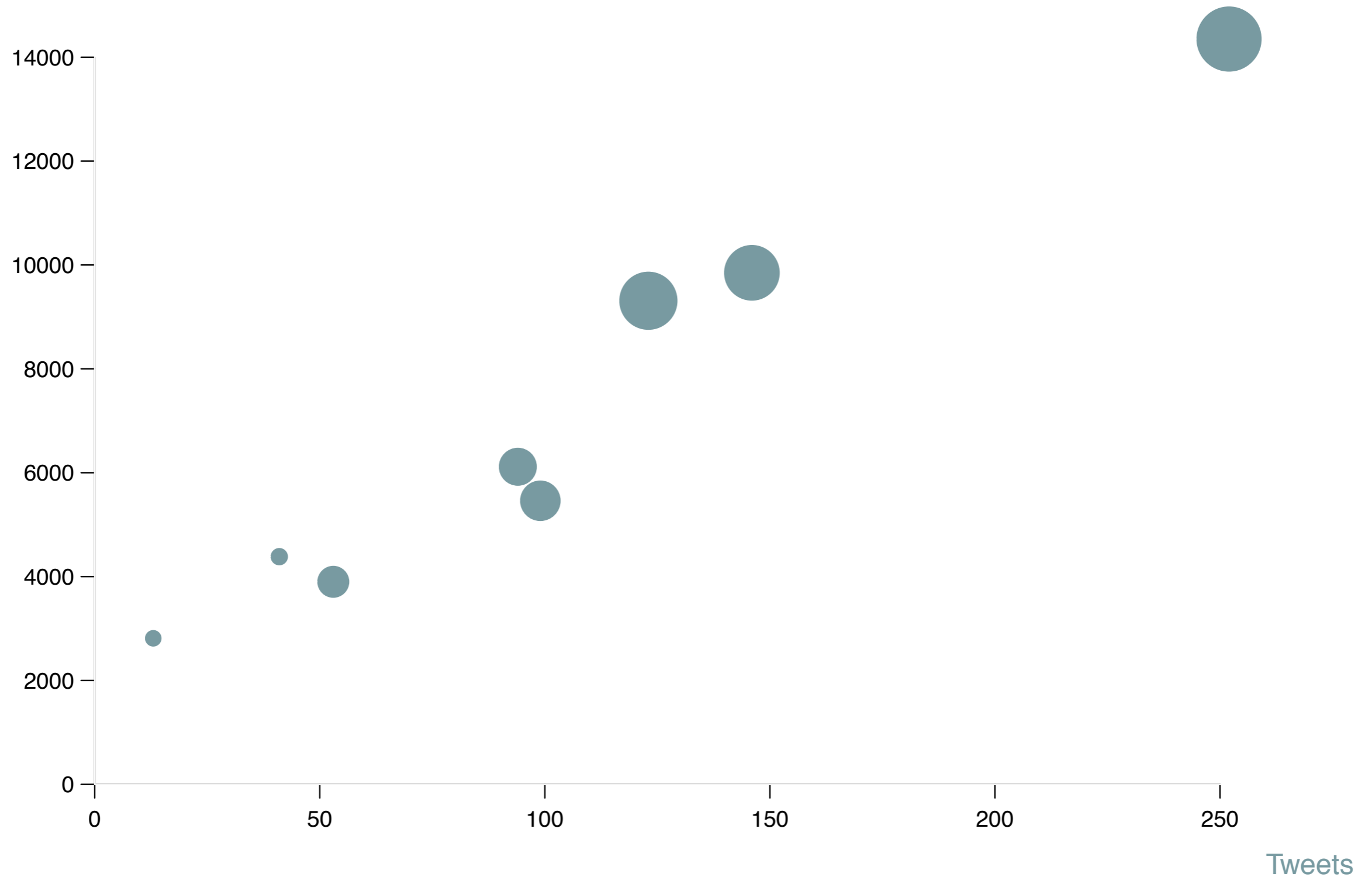
42,772 PLOS ONE Papers



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.

HTML Views



Tweets about Big Food Collection

| S | S | M | T | W | T | F |
|-------|---|---|---|---|----|----|
| April | | | | | | |
| 31 | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |

| S | S | M | T | W | T | F |
|-----|----|----|---|---|---|---|
| May | | | | | | |
| 28 | 29 | 30 | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |

| S | S | M | T | W | T | F |
|------|----|----|----|-----|----|----|
| June | | | | | | |
| 26 | 27 | 28 | 29 | 30 | 31 | |
| | | | | | | |
| | | | 12 | 119 | 43 | 53 |
| 26 | 11 | 7 | 26 | 172 | 19 | 19 |
| 6 | 1 | 2 | 3 | 4 | 5 | 6 |

| S | S | M | T | W | T | F |
|------|---|----|---|-----|----|----|
| July | | | | | | |
| 30 | 7 | 17 | 9 | 105 | 28 | 20 |
| 7 | 5 | 5 | 8 | 4 | 2 | |
| | | 2 | 3 | 4 | 1 | |
| 2 | 2 | 23 | | | | 3 |
| | | 16 | | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |

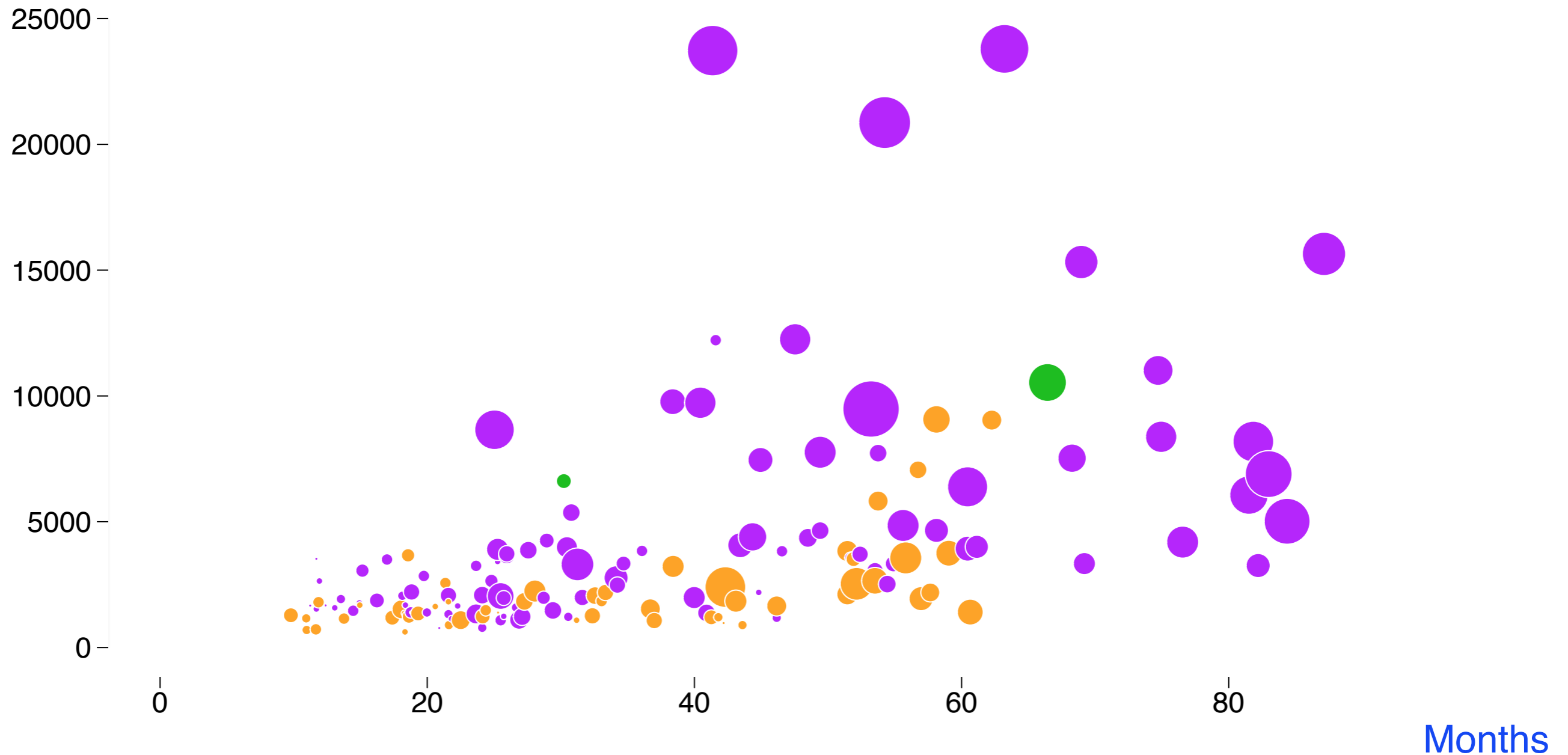
| S | S | M | T | W | T | F |
|--------|----|----|----|----|---|---|
| August | | | | | | |
| 28 | 29 | 30 | 31 | 12 | | 5 |
| 3 | 2 | 1 | 5 | | 4 | 1 |
| | | 1 | | | 1 | |
| | | | | | | |
| | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| S | S | M | T | W | T | F |
|-----------|----|----|----|----|----|----|
| September | | | | | | |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 |

PLOS Papers funded by Wellcome Trust MOPs

Total views are combined HTML views and PDF downloads from the PLOS website. Bubble size correlates with CrossRef citations, and bubble color with the PLOS journal. Data collected September 3, 2012.

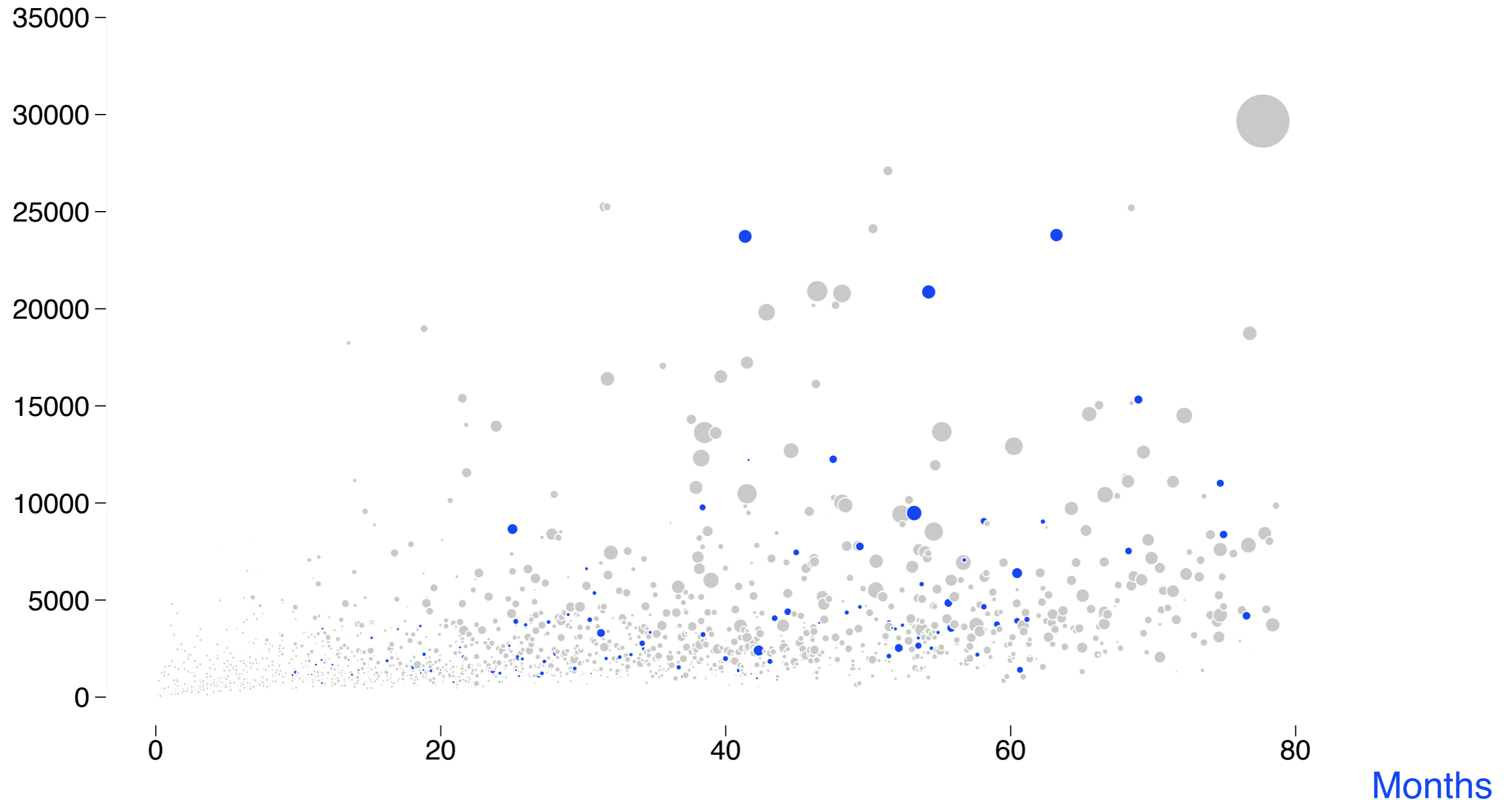
Total Views



PLoS Papers funded by Wellcome Trust MOPs

Total views are combined HTML views and PDF downloads from the PLOS website for 1970 papers. Bubble size correlates with CrossRef citations. Blue dots are papers funded by MOPs. Data collected September 3, 2012.

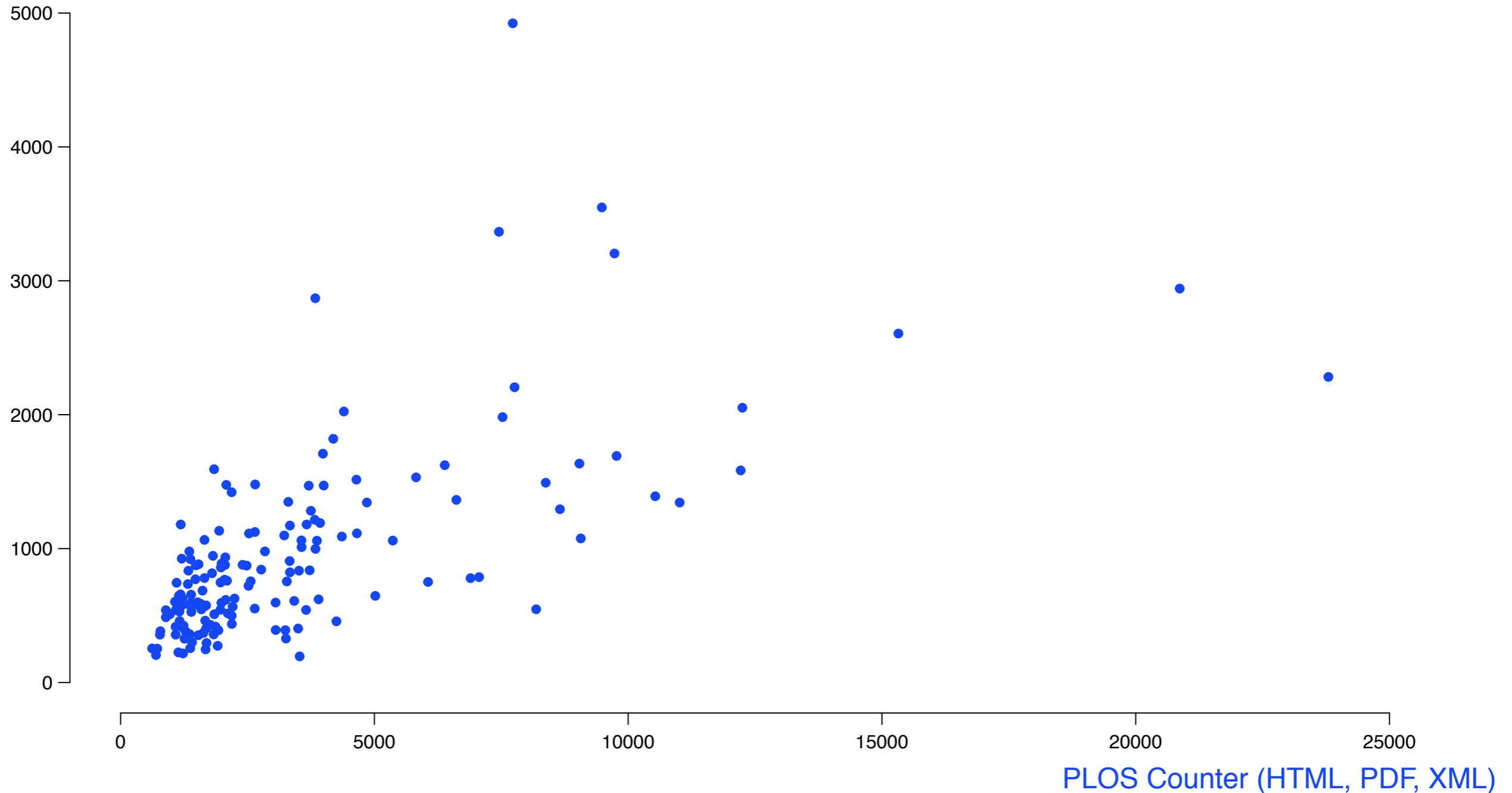
Total Views



Usage Stats PLOS Website vs. PubMed Central

Combined usage stats from the PLOS website vs. combined usage stats from PubMed Central for 162 PLOS papers funded by the Wellcome Trust MOPs. Data collected September 3, 2012.

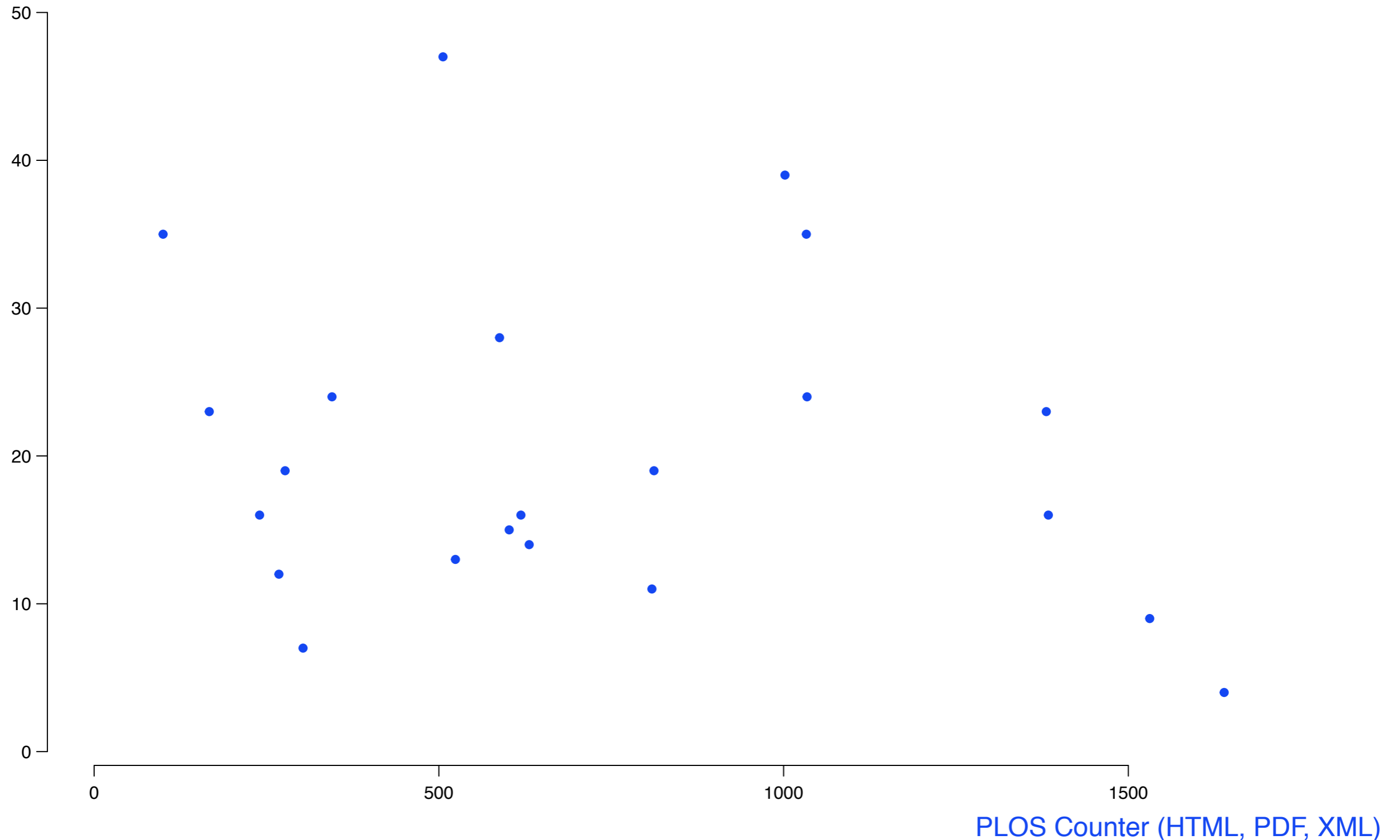
[PMC \(HTML, PDF\)](#)



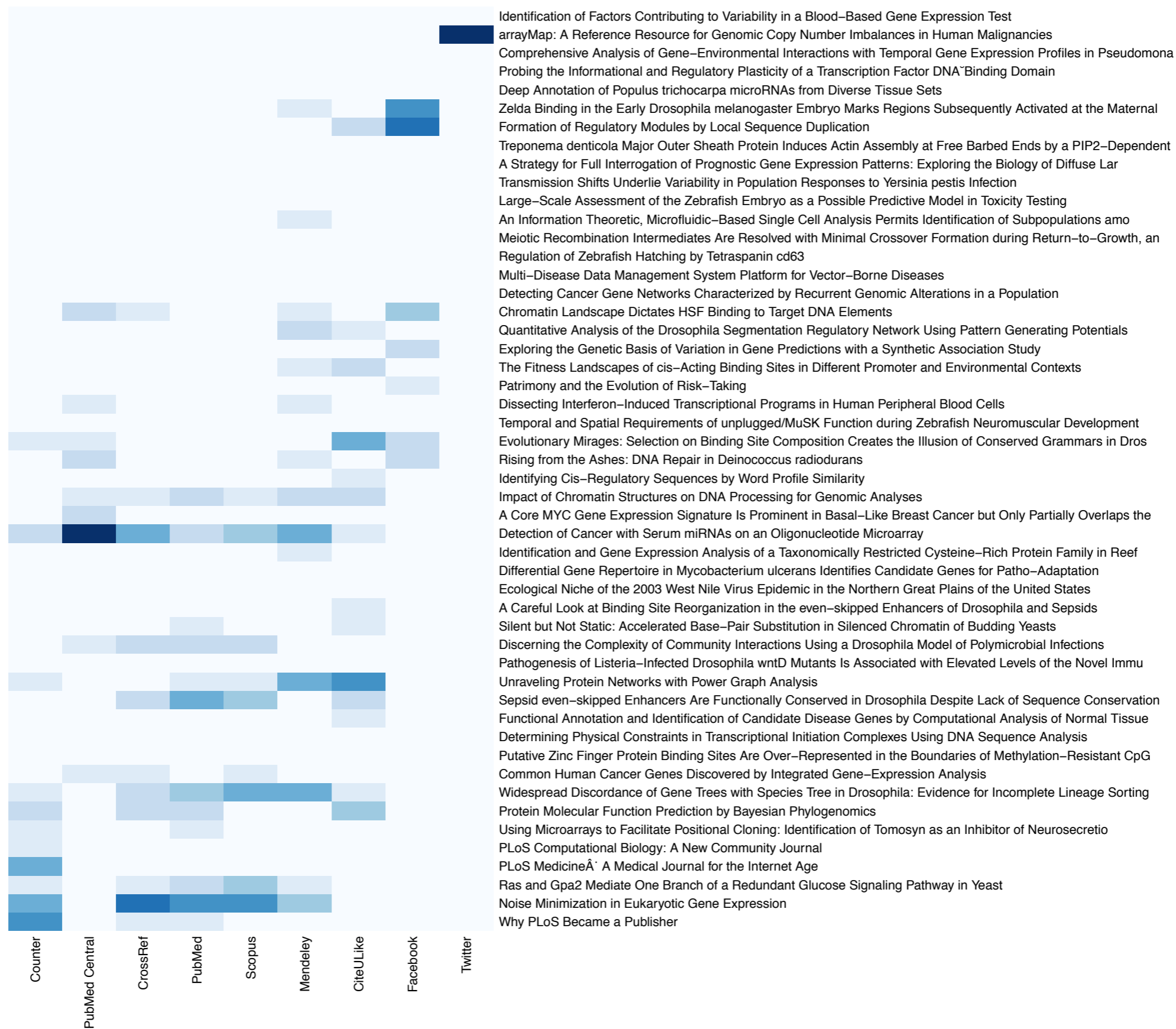
Usage stats from Bielefeld University PLOS ONE Papers

Combined Usage Stats from the PLOS website vs. fulltext downloads from the Bielefeld repository for 22 PLOS ONE papers published in 2011. Data collected by Najko Jahn.

[Bielefeld Fulltext PDF](#)



PLoS Papers authored by Michael B. Eisen



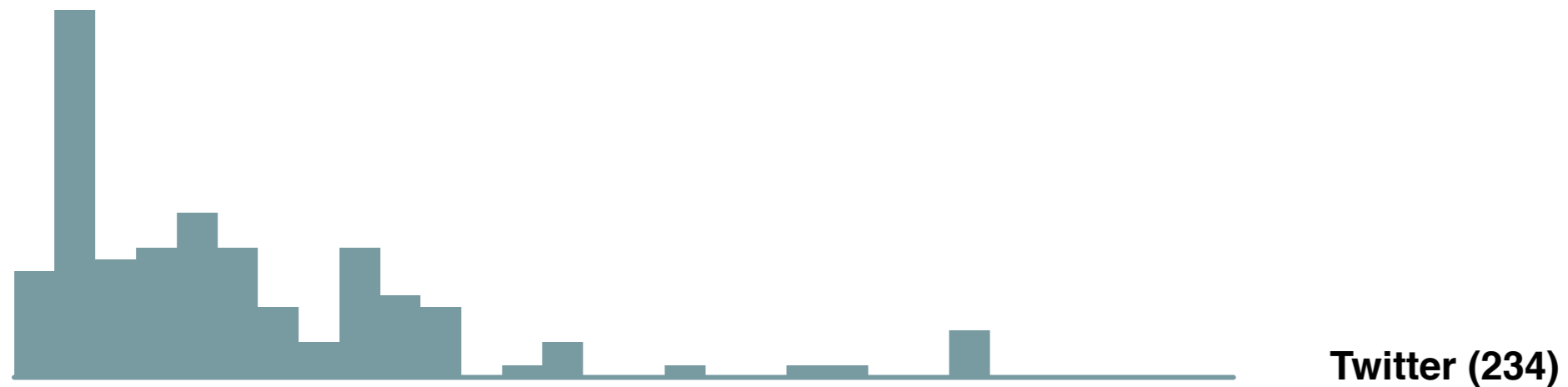
Popularity of the Ten Simple Rules Collection

PDF downloads (open circles), HTML pageviews (closed circles), and Mendeley readers (numbers on the right) for 23 editorials in PLoS Computational Biology. Articles are sorted by descending age.



Total Article Views

Why do We Have to Learn This Stuff - A New Genetics for 21st Century Students



Social Media Activity in first 30 days after Publication