

http://www.flickr.com/photos/wallyg/156079118/



Article-Level Metrics

Martin Fenner

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/)

**Information overload is not
filter failure, it is a discovery
deficit.**

Cameron Neylon

<http://www.slideshare.net/>

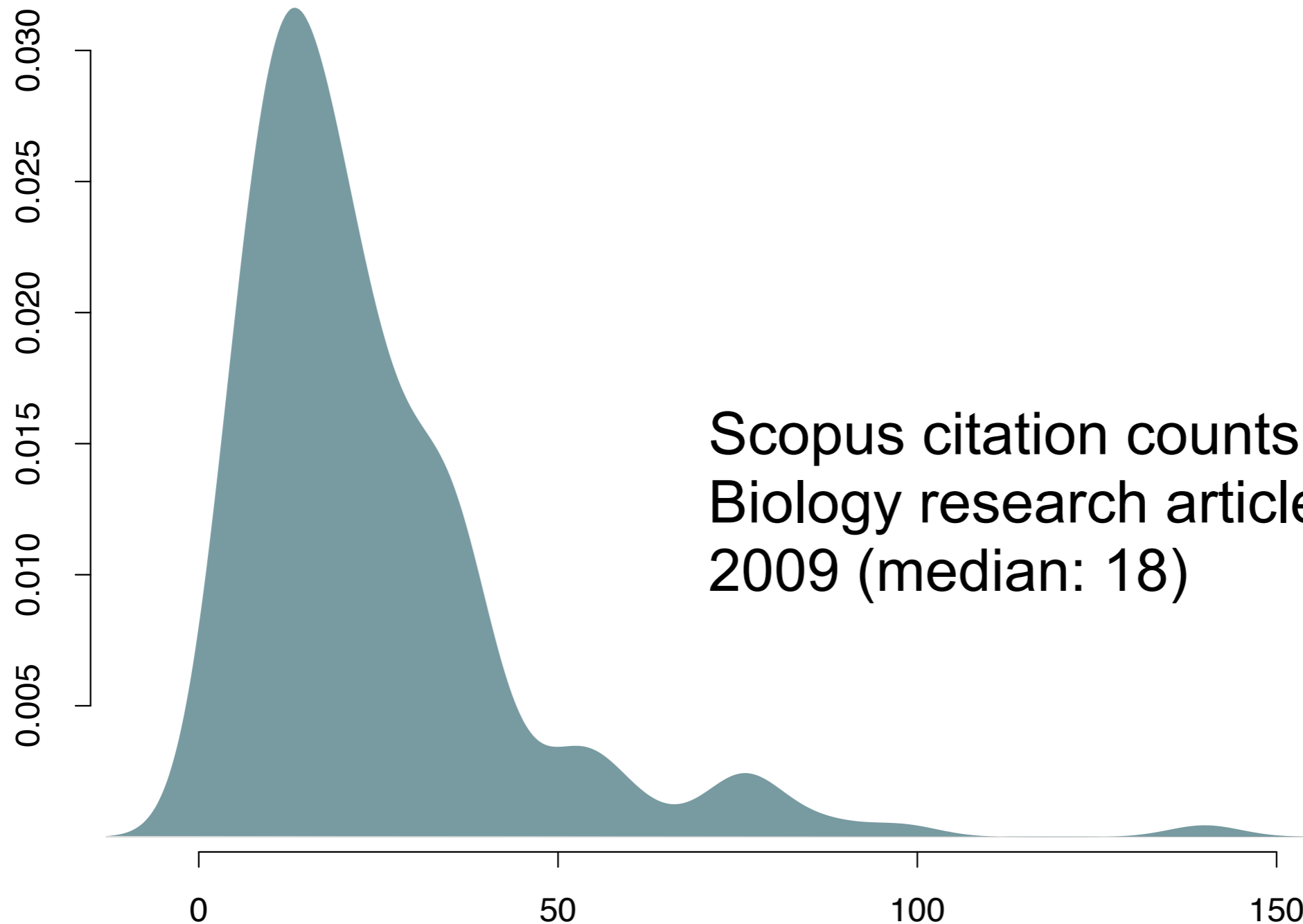
[CameronNeylon/its-not-filter-failure-its-a-
discovery-deficit](http://www.slideshare.net/CameronNeylon/its-not-filter-failure-its-a-discovery-deficit)

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

Probability

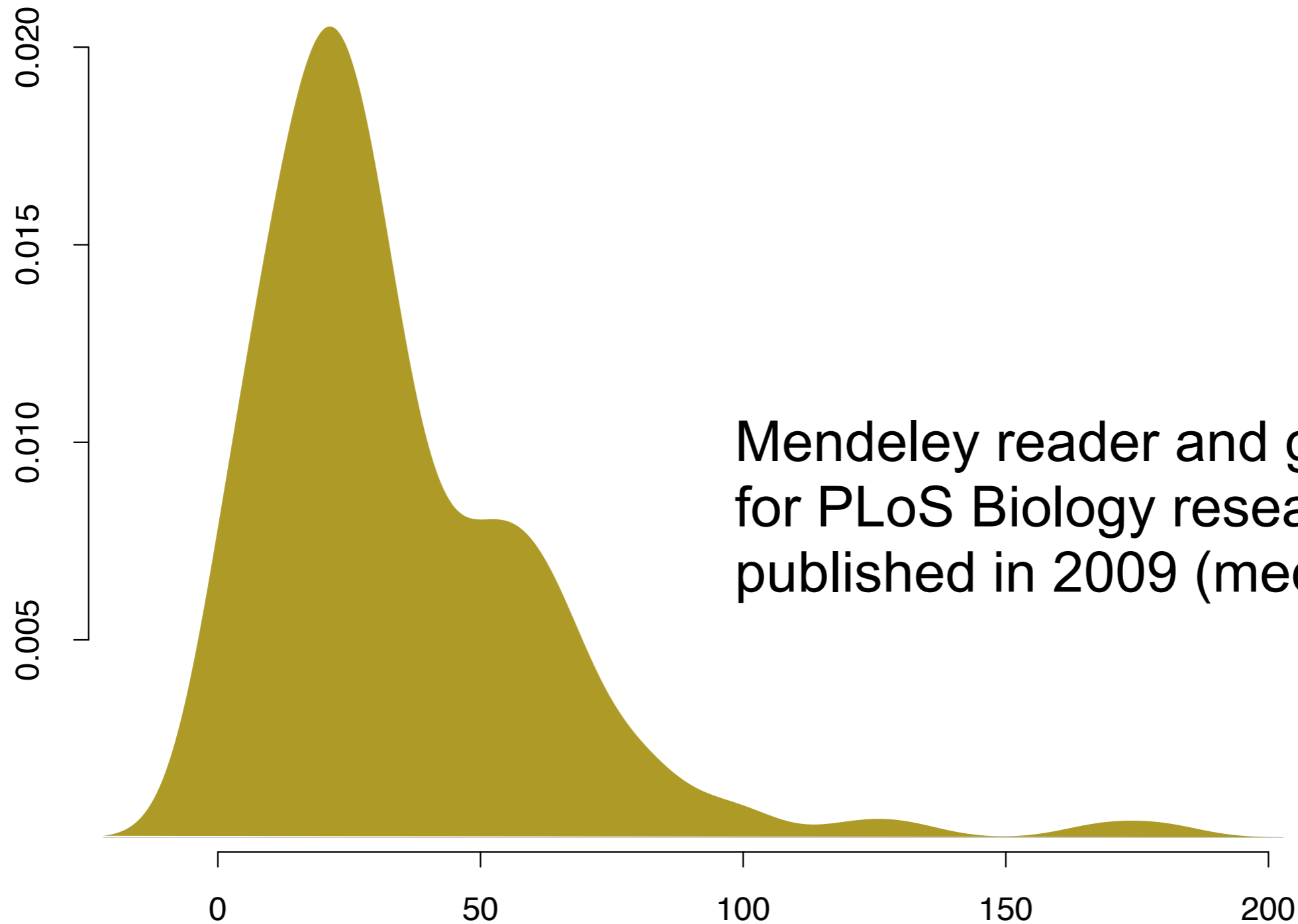


Source: PLoS, Scopus. Metrics were collected on July 13, 2012.

Citations

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

Social Web

Mendeley

CiteULike

Facebook

Twitter

Research Blogging

PLoS Comments

Ideal ALM sources should be ...

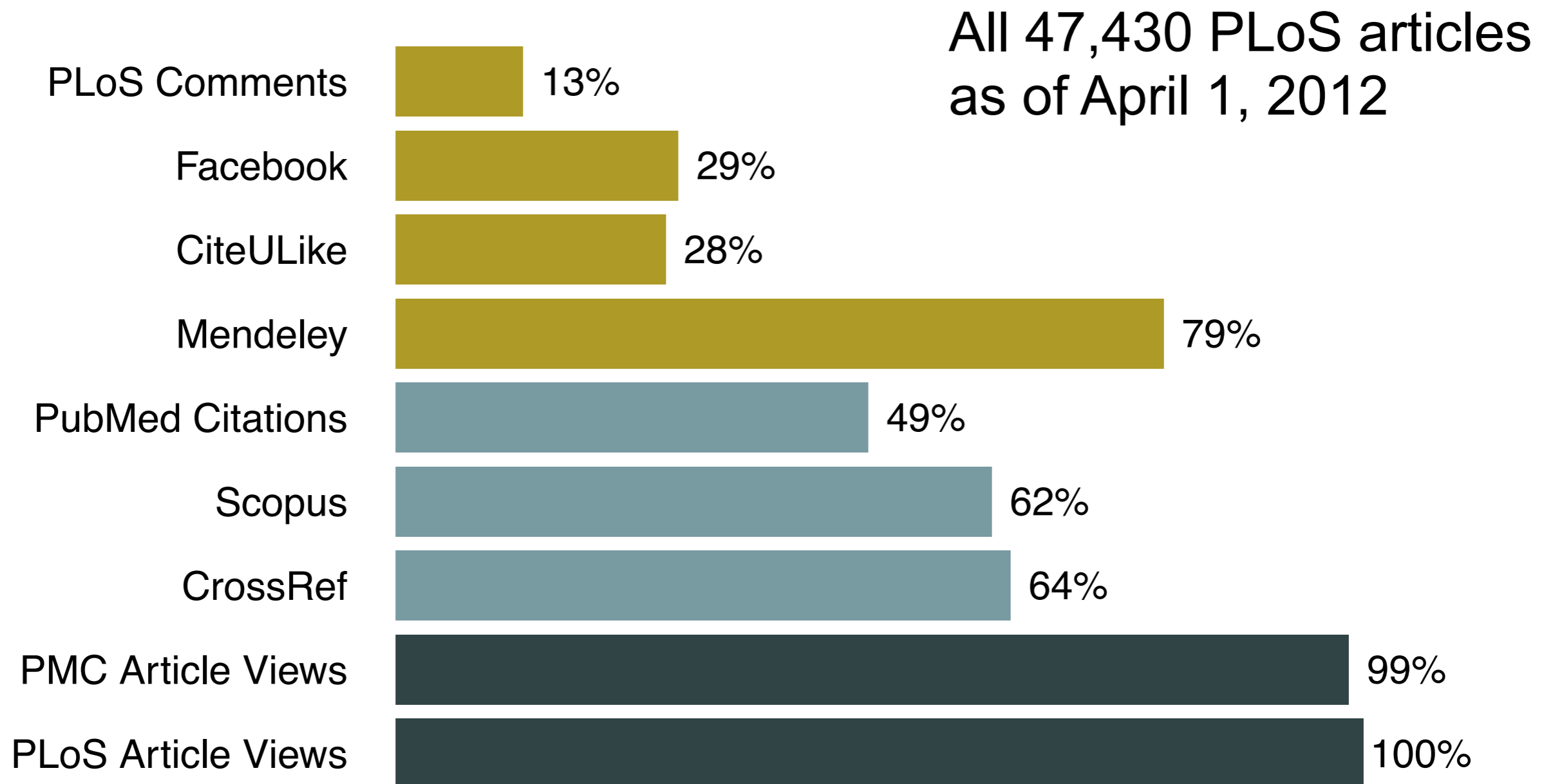
Relevant for the *process whereby scientific studies are absorbed into the body of knowledge*

Available in machine-readable form (API)

Covering a good proportion of articles

Immune to gaming

Proportion of articles covered by source



Most Article-Level Metrics are not controlled by the publisher of the paper.

Usage

PLoS Journal Site
(HTML, PDF, XML)

PubMed Central
(abstract, fulltext,
PDF, figures)

Citations

CrossRef

Scopus

Web of Science

PubMed Central

Social Web

Mendeley

CiteULike

Facebook

Twitter

Research Blogging

PLoS Comments

**Several organizations are
already collecting your metrics**



PLoS collects all ALM in-house

Open Data

PLoS ALM API

<http://api.plos.org/>

PLoS ALM Data dump

<http://www.plosone.org/static/usageData.action>

Open Source

PLoS ALM Application

<https://github.com/articlemetrics/alm>

Data analysis and visualization

<https://github.com/articlemetrics/plosOpenR>

ALM are for authors




Display all ALM for their PLoS papers



PLoS papers by Michael Eisen

ALM are for authors

Display ALM on their academic homepage

- [DNA barcoding the native flowering plants and conifers of wales.](#)
 1. de Vere N, Rich TC, Ford CR, Trinder SA, Long C, Moore CW, Satterthwaite D, Davies H, Allainguillaume J, Ronca S, Tatarinova T, Garbett H, Walker K, Wilkinson MJ. PLoS One. 2012;7(6):e37945. Epub 2012 Jun 6. PMID: 22701588 [PubMed - in process] **Free PMC Article**
[Related citations](#)  **Tweet** {27}  **Like** {274}  {7,577}
- [Systematic and evolutionary insights derived from mtDNA COI barcode diversity in the Decapoda \(Crustacea: Malacostraca\).](#)
 2. Matzen da Silva J, Creer S, dos Santos A, Costa AC, Cunha MR, Costa FO, Carvalho GR. PLoS One. 2011 May 12;6(5):e19449. PMID: 21589909 [PubMed - indexed for MEDLINE] **Free PMC Article**
[Related citations](#)
- [Validation of the barcoding gene COI for use in forensic genetic species identification.](#)
 3. Dawnay N, Ogden R, McEwing R, Carvalho GR, Thorpe RS. Forensic Sci Int. 2007 Nov 15;173(1):1-6. Epub 2007 Feb 14. PMID: 17300895 [PubMed - indexed for MEDLINE]
[Related citations](#)
- [Phylogenetic diversity \(PD\) and biodiversity conservation: some bioinformatics challenges.](#)
 4. Faith DP, Baker AM. Evol Bioinform Online. 2007 Feb 17;2:121-8. PMID: 19455206 [PubMed] **Free PMC Article**
[Related citations](#)
- [Mitochondrial DNA sequences from dried snake venom: a DNA barcoding approach to the identification of venom samples.](#)
 5. Pook CE, McEwing R. Toxicon. 2005 Dec 1;46(7):711-5. Epub 2005 Sep 12. PMID: 16157361 [PubMed - indexed for MEDLINE]
[Related citations](#)

ALM are for funders

Report the impact of their funding

2009

Malnutrition and Mortality Patterns among Internally Displaced and Non-Displaced Population Living in a Camp, a Village or a Town in Eastern Chad
Ranking Malaria Risk Factors to Guide Malaria Control Efforts in African Highlands
Outcomes after Chemotherapy with WHO Category II Regimen in a Population with High Prevalence of Drug Resistant Tuberculosis
Field Evaluation of Two Rapid Diagnostic Tests for *Neisseria meningitidis* Serogroup A during the 2006 Outbreak in Niger
Safety and Efficacy of Dihydroartemisinin-Piperaquine in Falciparum Malaria: A Prospective Multi-Centre Individual Patient Data Analysis
Research Ethics Review in Humanitarian Contexts: The Experience of the Independent Ethics Review Board of Médecins Sans Frontières
Prevalence Study of Yaws in the Democratic Republic of Congo Using the Lot Quality Assurance Sampling Method
Focusing on Quality Patient Care in the New Global Subsidy for Malaria Medicines
Feasibility, Drug Safety, and Effectiveness of Etiological Treatment Programs for Chagas Disease in Honduras, Guatemala, and Bolivia: 10-Year Experience
Prevalence of Buruli Ulcer in Akonolinga Health District, Cameroon: Results of a Cross Sectional Survey
Mortality of Patients Lost to Follow-Up in Antiretroviral Treatment Programmes in Resource-Limited Settings: Systematic Review and Meta-Analysis
Surgical Task Shifting in Sub-Saharan Africa
A Large-Scale Distribution of Milk-Based Fortified Spreads: Evidence for a New Approach in Regions with High Burden of Acute Malnutrition
Influence of Rapid Malaria Diagnostic Tests on Treatment and Health Outcome in Fever Patients, Zanzibar: A Crossover Validation Study
Multiple Origins and Regional Dispersal of Resistant dhps in African *Plasmodium falciparum* Malaria
Prognostic Accuracy of WHO Growth Standards to Predict Mortality in a Large-Scale Nutritional Program in Niger
The Evaluation of a Rapid In Situ HIV Confirmation Test in a Programme with a High Failure Rate of the WHO HIV Two-Test Diagnostic Algorithm

2010

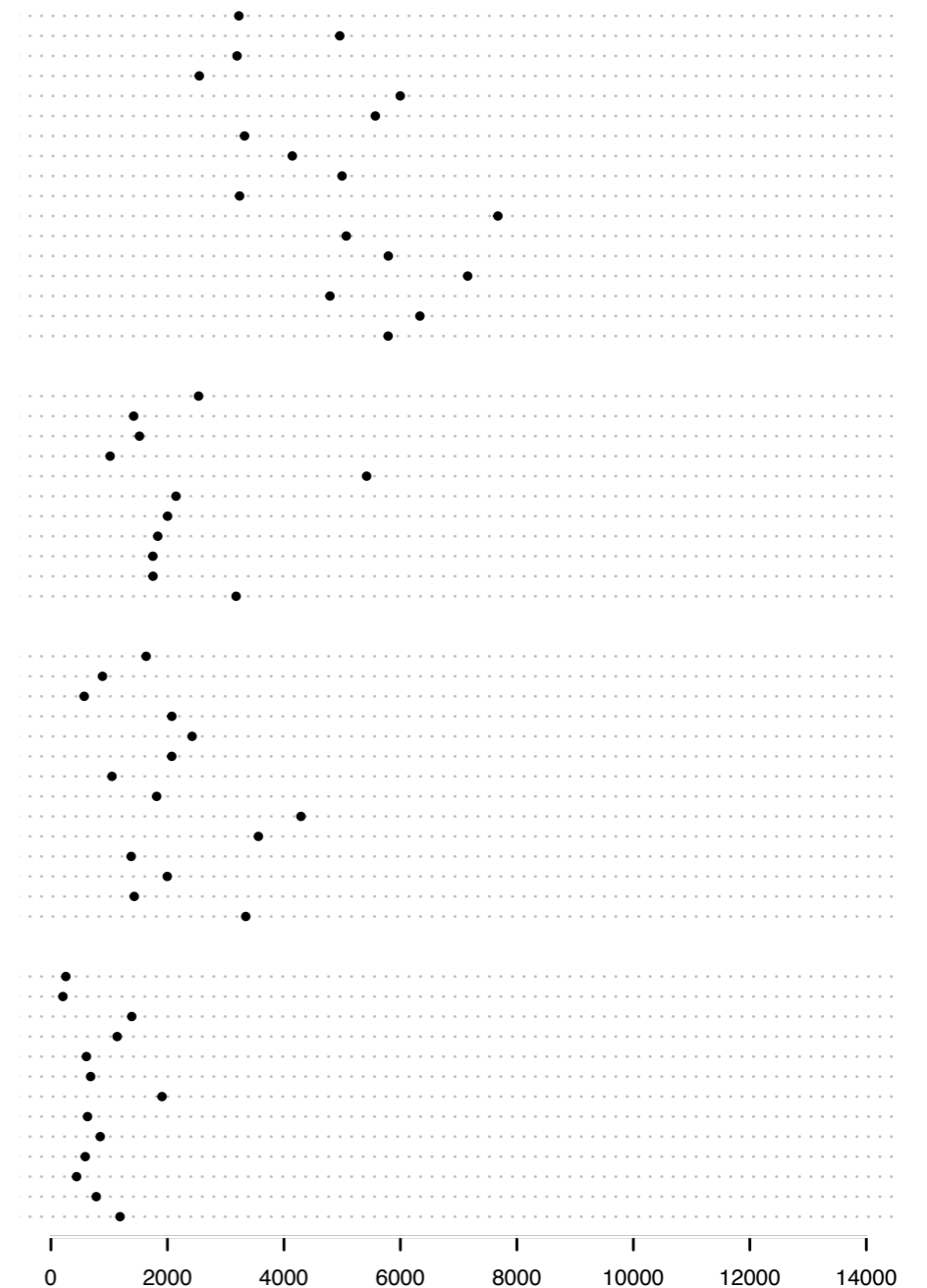
Epidemic Levels of Drug Resistant Tuberculosis (MDR and XDR-TB) in a High HIV Prevalence Setting in Khayelitsha, South Africa
Cost-Effectiveness of Primary Prophylaxis of AIDS Associated Cryptococcosis in Cambodia
Geographical Variation in the Response of Visceral Leishmaniasis to Paromomycin in East Africa: A Multicentre, Open-Label, Randomized Trial
Trends in Loss to Follow-Up among Migrant Workers on Antiretroviral Therapy in a Community Cohort in Lesotho
Using Touchscreen Electronic Medical Record Systems to Support and Monitor National Scale-Up of Antiretroviral Therapy in Malawi
Visceral Leishmaniasis Relapse in Southern Sudan (1999-2007): A Retrospective Study of Risk Factors and Trends
NECT Is Next: Implementing the New Drug Combination Therapy for *Trypanosoma brucei gambiense* Sleeping Sickness
Early Adherence to Antiretroviral Medication as a Predictor of Long-Term HIV Virological Suppression: Five-Year Follow Up of an Observational Cohort
Mortality Reduction Associated with HIV/AIDS Care and Antiretroviral Treatment in Rural Malawi: Evidence from Registers, Coffin Sales and Funerals
Nevirapine-Associated Early Hepatotoxicity: Incidence, Risk Factors, and Associated Mortality in a Primary Care ART Programme in South Africa
Microscopy Quality Control in Médecins Sans Frontières Programs in Resource-Limited Settings

2011

Ambulatory Multi-Drug Resistant Tuberculosis Treatment Outcomes in a Cohort of HIV-Infected Patients in a Slum Setting in Mumbai, India
How Do Patients Who Fail First-Line TB Treatment but Who Are Not Placed on an MDR-TB Regimen Fare in South India?
Economic Feasibility of a New Method to Estimate Mortality in Crisis-Affected and Resource-Poor Settings
Treatment of Tuberculosis in a Region with High Drug Resistance: Outcomes, Drug Resistance Amplification and Re-Infection
Simplified ART Delivery Models Are Needed for the Next Phase of Scale Up
Accuracy of Five Algorithms to Diagnose Gambiense Human African Trypanosomiasis
Evaluation of Combined LED-Fluorescence Microscopy and Bleach Sedimentation for Diagnosis of Tuberculosis at Peripheral Health Service Level
The Use of a Mobile Laboratory Unit in Support of Patient Management and Epidemiological Surveillance during the 2005 Marburg Outbreak in Angola
If You Could Only Choose Five Psychotropic Medicines: Updating the Interagency Emergency Health Kit
Improving Effective Surgical Delivery in Humanitarian Disasters: Lessons from Haiti
Renal Safety of a Tenofovir-Containing First Line Regimen: Experience from an Antiretroviral Cohort in Rural Lesotho
Performance of LED-Based Fluorescence Microscopy to Diagnose Tuberculosis in a Peripheral Health Centre in Nairobi
Correcting for Mortality Among Patients Lost to Follow Up on Antiretroviral Therapy in South Africa: A Cohort Analysis
Correcting Mortality for Loss to Follow-Up: A Nomogram Applied to Antiretroviral Treatment Programmes in Sub-Saharan Africa

2012

Adverse Events among HIV/MDR-TB Co-Infected Patients Receiving Antiretroviral and Second Line Anti-TB Treatment in Mumbai, India
High Prevalence of Tuberculosis and Serious Bloodstream Infections in Ambulatory Individuals Presenting for Antiretroviral Therapy in Malawi
Sodium Stibogluconate (SSG) & Paromomycin Combination Compared to SSG for Visceral Leishmaniasis in East Africa: A Randomised Controlled Trial
Early Prediction of Treatment Efficacy in Second-Stage Gambiense Human African Trypanosomiasis
Ready-to-Use Therapeutic Food for Catch-Up Growth in Children after an Episode of *Plasmodium falciparum* Malaria: An Open Randomised Controlled Trial
Association of BMI Category Change with TB Treatment Mortality in HIV-Positive Smear-Negative and Extrapulmonary TB Patients in Myanmar and Zimbabwe
Prevalence, Features and Risk Factors for Malaria Co-Infections amongst Visceral Leishmaniasis Patients from Amudat Hospital, Uganda
TSH-CHECK-1 Test: Diagnostic Accuracy and Potential Application to Initiating Treatment for Hypothyroidism in Patients on Anti-Tuberculosis Drugs
Adherence to Self-Administered Tuberculosis Treatment in a High HIV-Prevalence Setting: A Cross-Sectional Survey in Homa Bay, Kenya
Comparison of Methods to Correct Survival Estimates and Survival Regression Analysis on a Large HIV African Cohort
Gender Differences in Immune Reconstitution: A Multicentric Cohort Analysis in Sub-Saharan Africa
Are Tuberculosis Patients in a Tertiary Care Hospital in Hyderabad, India Being Managed According to National Guidelines?
Wind-Driven Roof Turbines: A Novel Way to Improve Ventilation for TB Infection Control in Health Facilities



HTML views and PDF downloads for
Médecins sans Frontières authored PLoS papers.

Total Article Views

ALM are for funders

Connect grants to papers to metrics

PLoS papers funded by the EU 7th Framework Programme. A collaboration with OpenAIRE.

Cumulative Views

● The Network of Global Corporate Control
10.1371/journal.pone.0025995
FP7 grant 255987

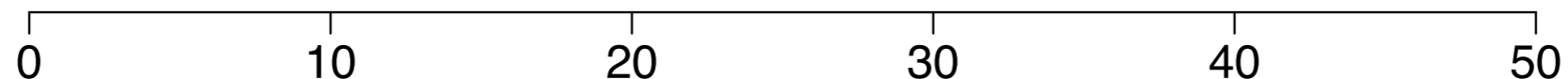
○
100 Citations

● Management Effectiveness of the World's Marine Fisheries
10.1371/journal.pbio.1000131
FP7 grant 219265

A Large Fraction of Extragenic RNA Pol II Transcription Sites Overlap Enhancers
10.1371/journal.pbio.1000384
FP7 grant 222008

● Genetic Structure of Europeans: A View from the North East
10.1371/journal.pone.0005472
FP7 grants 201413, 205419

● Meta-Analysis of 28,141 Individuals Identifies Common Variants within Five New Loci That Influence Uric Acid Concentrations
10.1371/journal.pgen.1000504
FP7 grant 201413



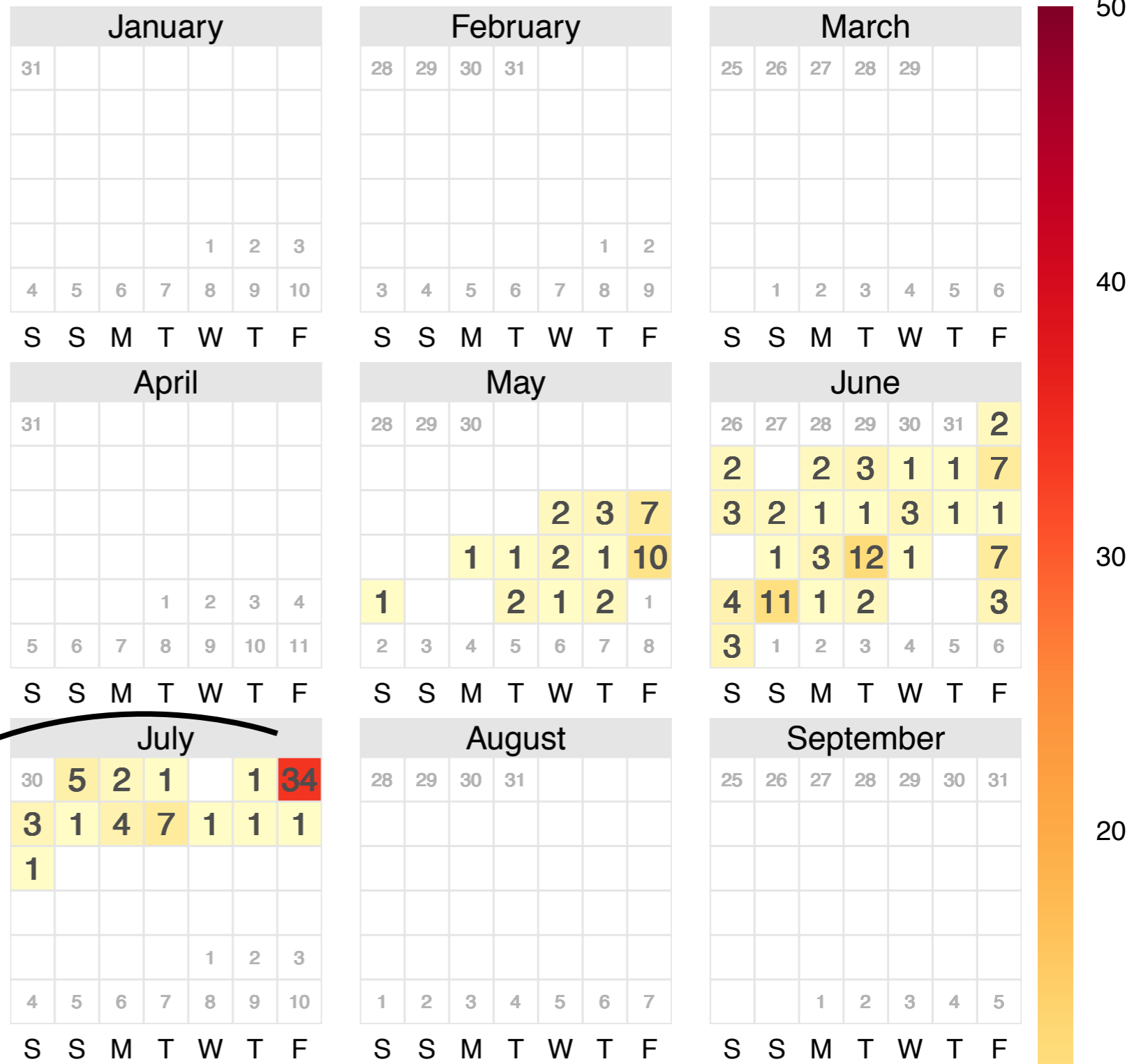
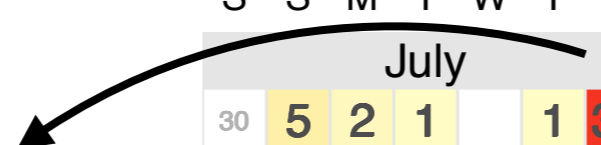
Months

ALM are for institutions

Track social web activity of their research

Tweets mentioning one of 122 PLoS papers published in 2012 by Stanford University staff (PLoS started tracking Twitter in May)

Barsh GS, Copenhaver GP, Gibson G, Williams SM (2012) Guidelines for Genome-Wide Association Studies. PLoS Genet 10.1371/journal.pgen.1002812

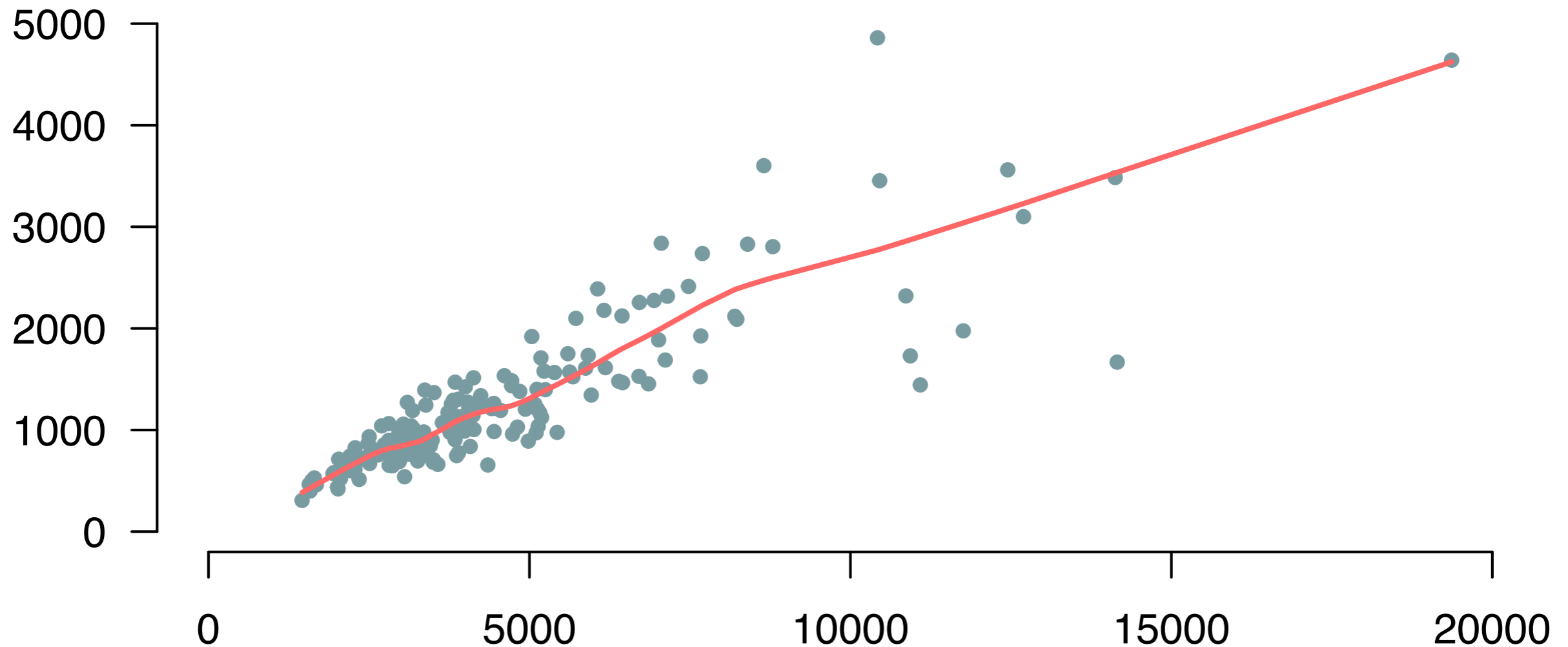


ALM for publishers

HTML views correlate with PDF downloads

PLoS Biology research articles published in 2009. Usage stats from PLoS website. One outlier was excluded.

PDF Downloads



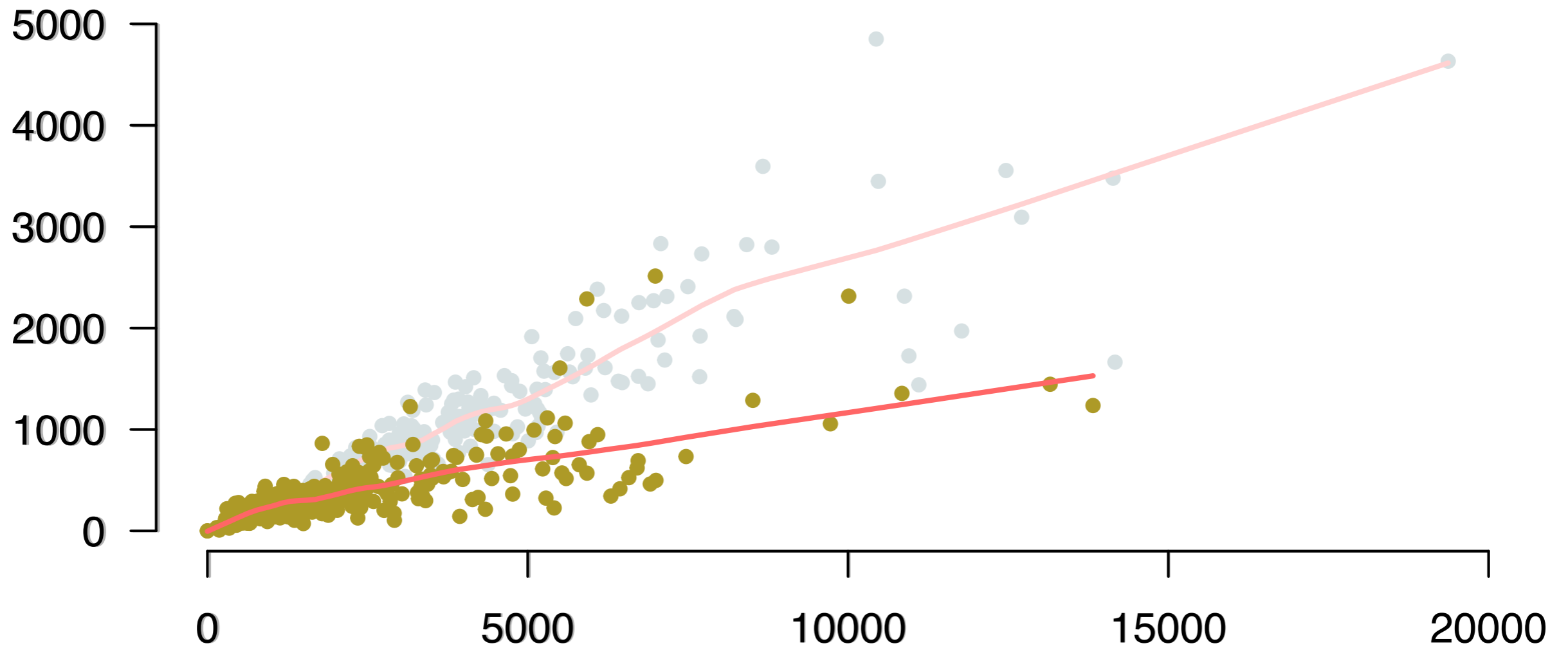
HTML Views

ALM for publishers

Higher HTML/PDF ratio for clinical trials

PLoS articles reporting clinical trial results. Usage stats from PLoS website. Two outliers were excluded.

PDF Downloads



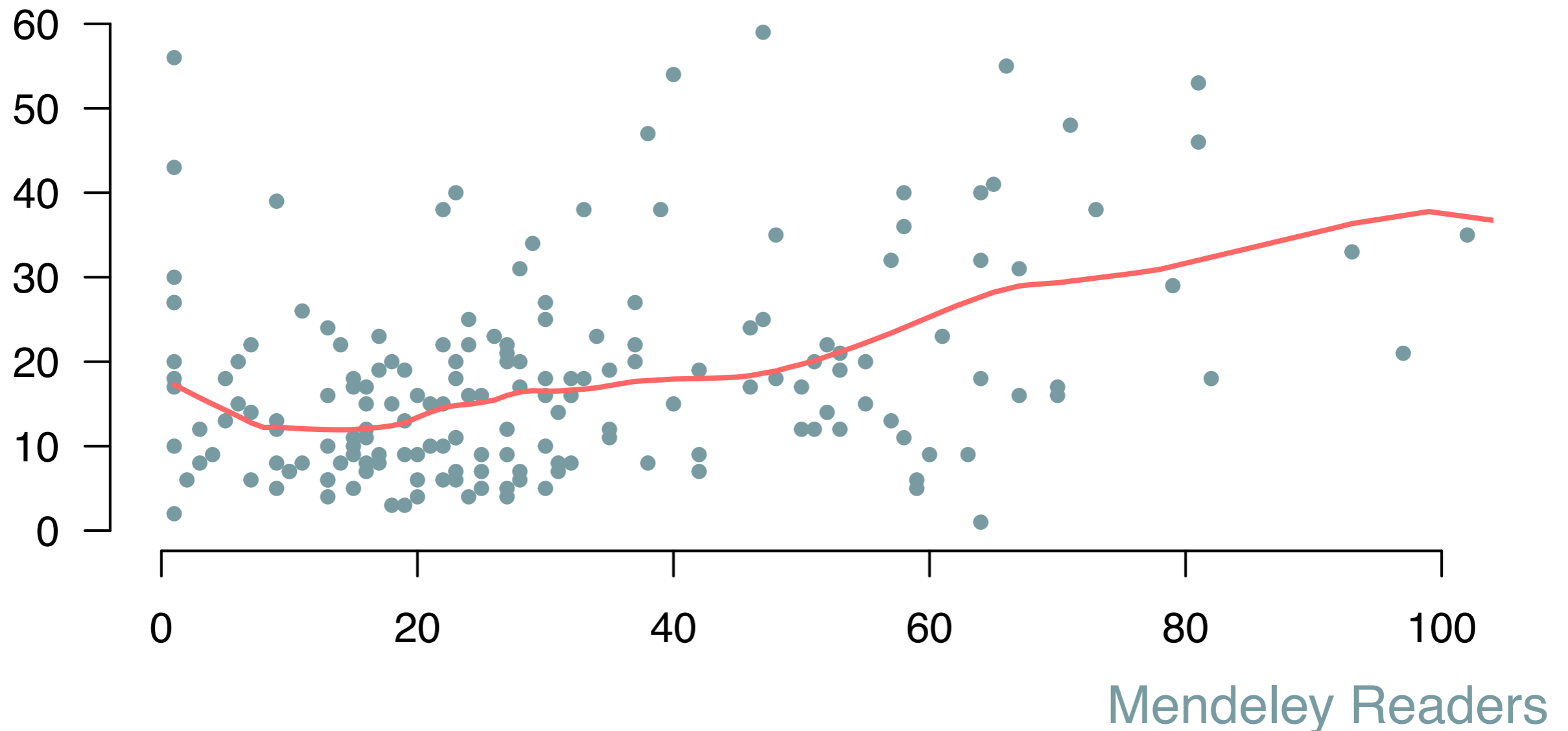
HTML Views

ALM for publishers

Mendeley readers poorly predict citations

PLoS Biology research
articles published in 2009.
Five outliers were excluded.

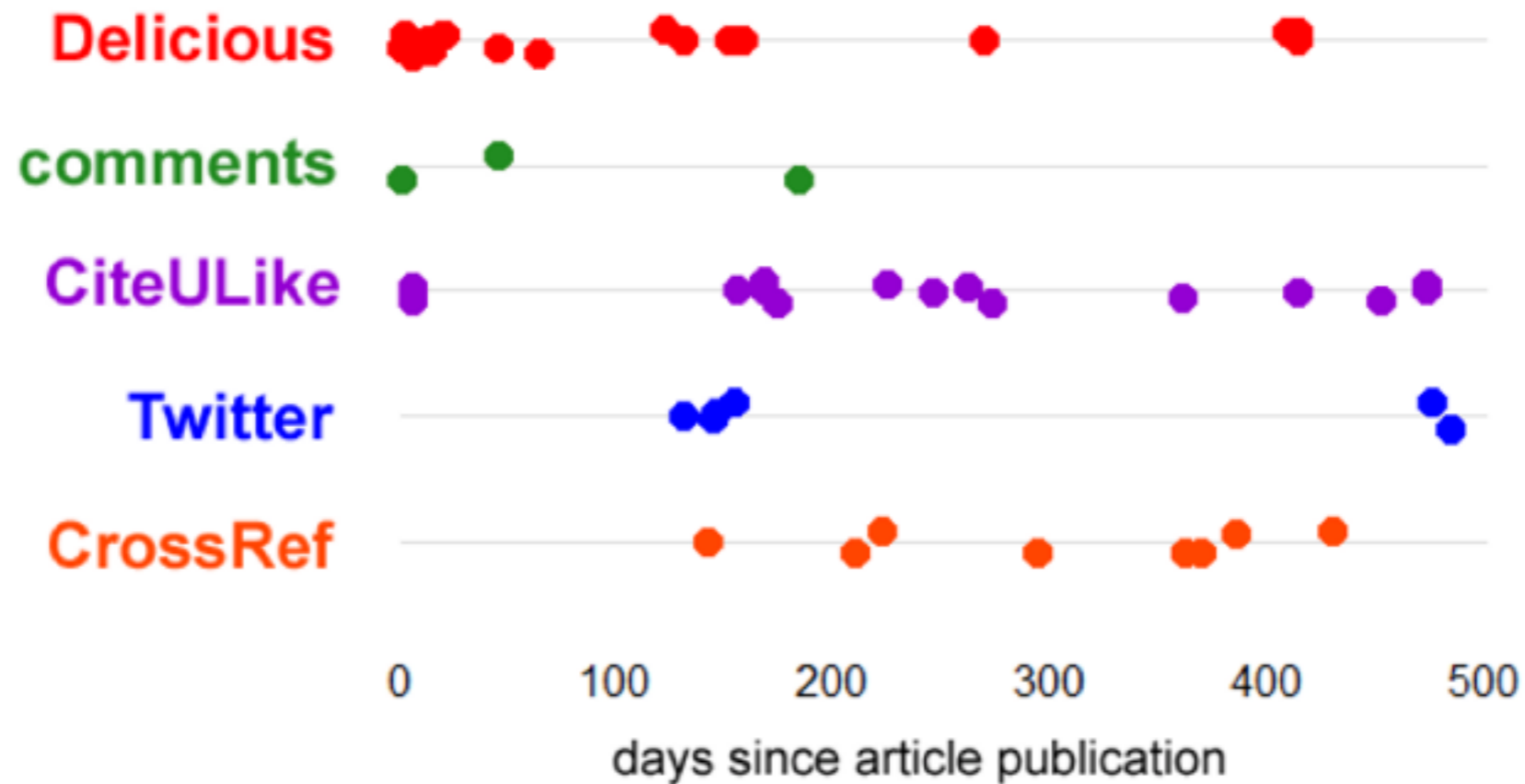
CrossRef Citations



Article-Level Metrics go beyond numbers

| | |
|-----------------|--|
| Time | Published 18 April 2011 |
| Location | Unilever Research and Development Vlaardingen, the Netherlands |
| People | RK Harika, MC Cosgrove, SJM Osendarp, P Verhoef and PL Zock |
| Links | doi: 10.1017/S0007114511001528 |
| Content | Abstract: Fatty acid composition of the diet may influence cardiovascular risk from ... |

Temporal relationship of events



Activity timelines for the article doi:10.1371/journal.pone.0006002. Each point represents a single event.

From: Priem J, Piwowar H, Hemminger, BM. Altmetrics in the wild: Using social media to explore scholarly impact. arXiv:1203.4745

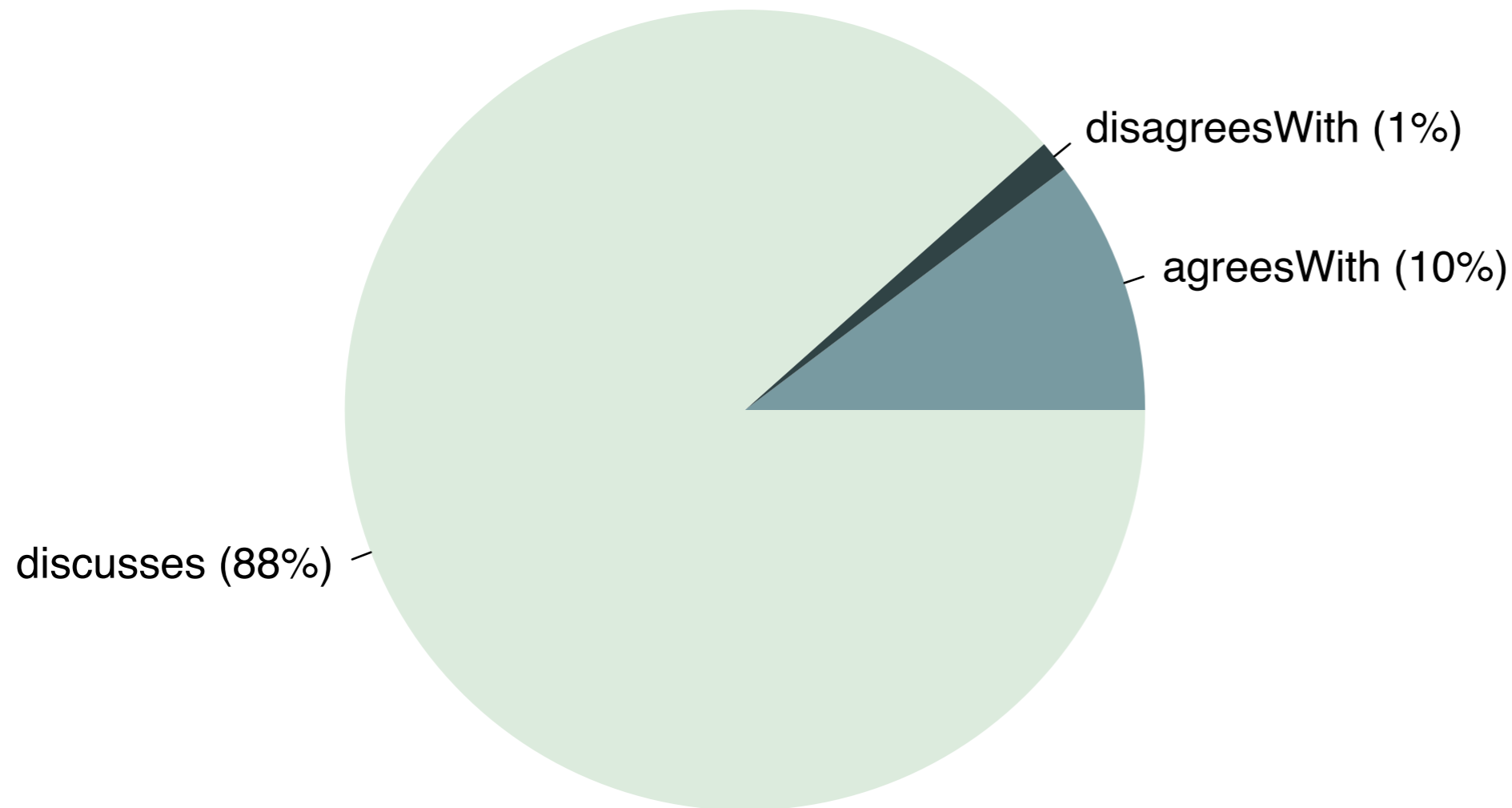


**UNHCR Operational Guidance
on the Use of Special Nutritional Products
to Reduce Micronutrient Deficiencies
and Malnutrition in Refugee Populations**



Defourny I, Minetti A, Harczi G, Doyon S, Sheperd S, Tectonidis M, Bradol JH, Golden M. A large-scale distribution of milk-based fortified spreads: evidence for a new approach in regions with high burden of acute malnutrition. PLoS ONE 10.1371/journal.pone.0005455.

Sentiment analysis of tweets linking to papers



467 tweets from October 2011 linking to scholarly papers, collected by altmetric.com. Citation Typing Ontology (CiTO) classification of tweets crowdsourced at crowdometer.org.