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Big shoulders in scholarly communication: data archiving+altmetrics.

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**big shoulders in
scholarly communication:**

**data archiving +
altmetrics**

Heather Piwovar [@researchremix](#)

DataONE postdoc with NESCent and Dryad, at UBC



some photos NC, SA

HighWire 2012











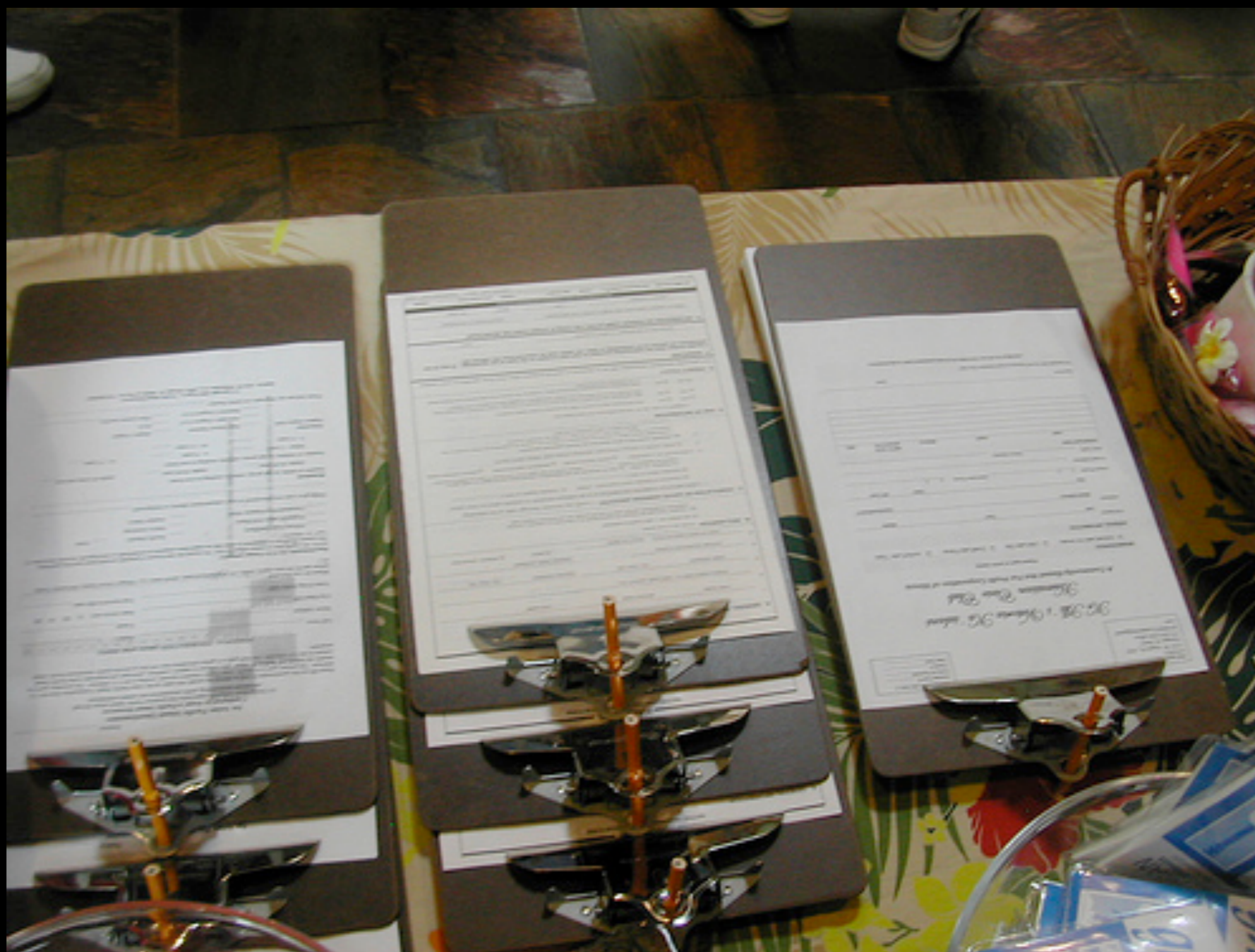








**in addition to a nice story,
we have evidence.**



Zimmerman, Tenopir, etc.

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$$10 * 100 = 1000$$



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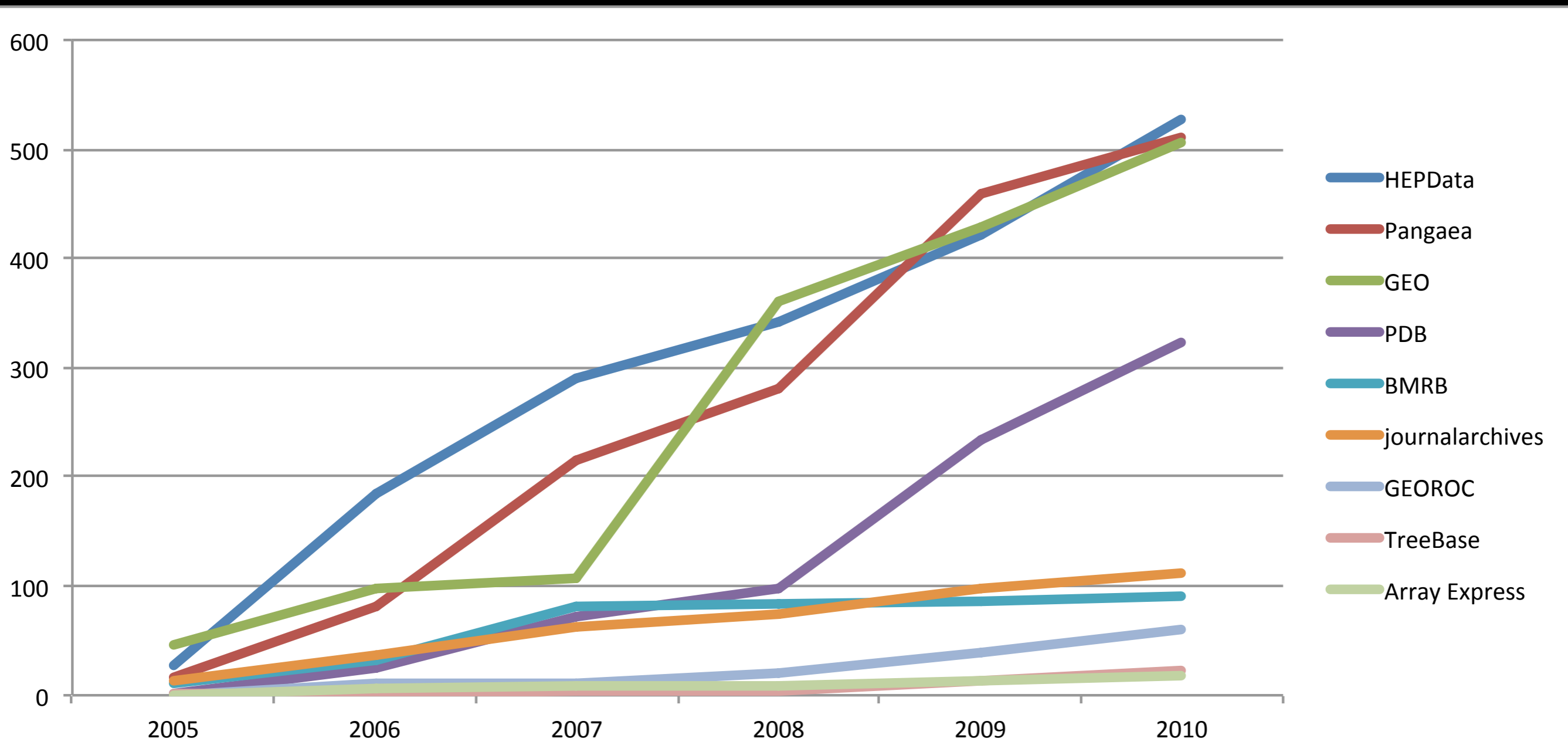
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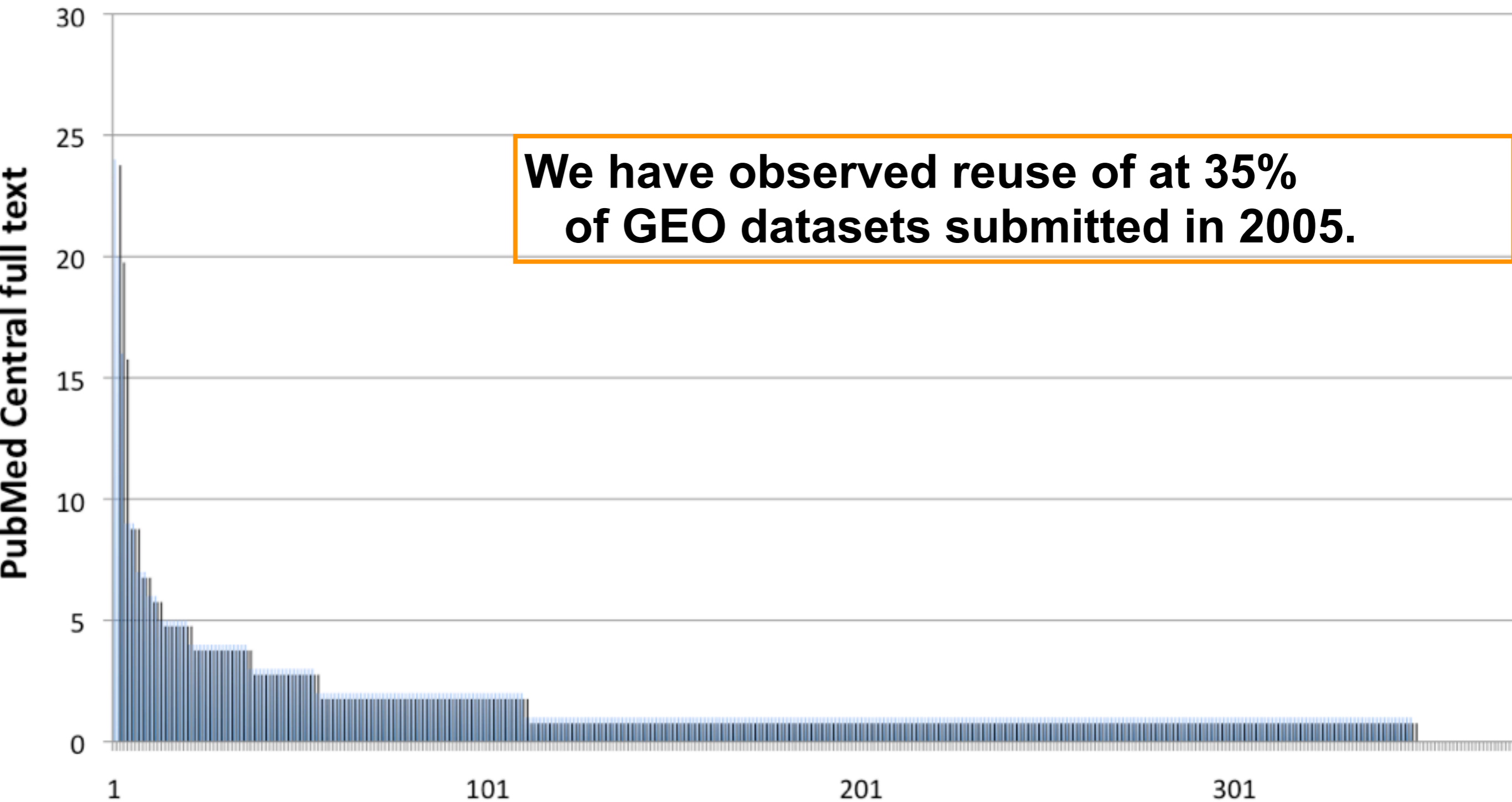
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Sobek, David (2005). Machiave.. Caprioli, Mary (2005). Primed .. Keller, Jonathan W. (2005). Le.. Greig, J. Michael and Paul F.. .. Emilie M. Hafner-Burton. Right.. David H. Bearce & Sawa Omori ... Navin Bapat .. Insurgency and t.. Lesley G. Terris & Zeev Maoz .. Lotta Harbom & Peter Wallenste.. Atsushi Tago. Determinants of .. Jaroslav Tir. Dividing Countri.. Hyung Min Kim & David L. Rouss.. Marie L. Besançon. Relative Re.. Henrik Urdal. People vs. Malth.. Quan Li & Ming Wen. The Immedi.. Karen Rasler & William R. Thom.. James Meernik. Justice and Pea.. Christina Schatzman. Politica.. Jacob Shamir & Khalil Shikaki .. Douglas M. Gibler, Toby J. Rid.. Ron P. Smith & Ali Tasiran. Th.. Erik Melander. Political Gend.. J. Joseph Hewitt. A Crisis-Den.. Charles R. Boehmer & David Sob.. Karl R. DeRouen Jr & Shaun Gol.. Vally Koubi. War and Economic .. Yehudith Auerbach & Yaeli Bloc.. Eric Neumayer. Inequality and .. link to google search results.. imported to Mendelej?.. 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Pangaea. <http://doi.pangaea.de/10.1594/PANGAEA.206394>.. <http://doi.pangaea.de/10.1594/PANGAEA.230042>.. <http://doi.pangaea.de/10.1594/PANGAEA.315658>.. <http://doi.pangaea.de/10.1594/PANGAEA.319950>.. <http://doi.pangaea.de/10.1594/PANGAEA.328911>.. <http://doi.pangaea.de/10.1594/PANGAEA.339110>.. <http://doi.pangaea.de/10.1594/PANGAEA.370797>.. <http://doi.pangaea.de/10.1594/PANGAEA.472208>.. <http://doi.pangaea.de/10.1594/PANGAEA.484677>.. <http://doi.pangaea.de/10.1594/PANGAEA.56129>.. <http://doi.pangaea.de/10.1594/PANGAEA.670929>.. <http://doi.pangaea.de/10.1594/PANGAEA.672035>.. <http://doi.pangaea.de/10.1594/PANGAEA.676688>.. <http://doi.pangaea.de/10.1594/PANGAEA.676892>.. <http://doi.pangaea.de/10.1594/PANGAEA.684703>.. <http://doi.pangaea.de/10.1594/PANGAEA.685594>.. <http://doi.pangaea.de/10.1594/PANGAEA.688263>.. <http://doi.pangaea.de/10.1594/PANGAEA.690658>.. <http://doi.pangaea.de/10.1594/PANGAEA.690848>.. <http://doi.pangaea.de/10.1594/PANGAEA.691304>.. <http://doi.pangaea.de/10.1594/PANGAEA.691478>.. <http://doi.pangaea.de/10.1594/PANGAEA.694086>.. <http://doi.pangaea.de/10.1594/PANGAEA.700959>.. <http://doi.pangaea.de/10.1594/PANGAEA.701279>.. <http://doi.pangaea.de/10.1594/PANGAEA.704257>.. <http://doi.pangaea.de/10.1594/PANGAEA.707898>.. <http://doi.pangaea.de/10.1594/PANGAEA.708249>.. <http://doi.pangaea.de/10.1594/PANGAEA.710774>.. <http://doi.pangaea.de/10.1594/PANGAEA.710788>.. <http://doi.pangaea.de/10.1594/PANGAEA.710795>.. <http://doi.pangaea.de/10.1594/PANGAEA.711337>.. <http://doi.pangaea.de/10.1594/PANGAEA.711520>.. <http://doi.pangaea.de/10.1594/PANGAEA.711534>.. <http://doi.pangaea.de/10.1594/PANGAEA.711655>.. <http://doi.pangaea.de/10.1594/PANGAEA.711656>.. <http://doi.pangaea.de/10.1594/PANGAEA.711985>.. <http://doi.pangaea.de/10.1594/PANGAEA.711998>.. <http://doi.pangaea.de/10.1594/PANGAEA.712921>.. <http://doi.pangaea.de/10.1594/PANGAEA.712938>.. <http://doi.pangaea.de/10.1594/PANGAEA.713701>.. <http://doi.pangaea.de/10.1594/PANGAEA.720961>.. <http://doi.pangaea.de/10.1594/PANGAEA.721804>.. <http://doi.pangaea.de/10.1594/PANGAEA.722600>.. <http://doi.pangaea.de/10.1594/PANGAEA.722622>.. <http://doi.pangaea.de/10.1594/PANGAEA.726861>.. <http://doi.pangaea.de/10.1594/PANGAEA.727523>.. <http://doi.pangaea.de/10.1594/PANGAEA.728138>.. <http://doi.pangaea.de/10.1594/PANGAEA.728219>.. <http://doi.pangaea.de/10.1594/PANGAEA.728220>.. <http://doi.pangaea.de/10.1594/PANGAEA.733691>.. <http://doi.pangaea.de/10.1594/PANGAEA.736818>.. <http://doi.pangaea.de/10.1594/PANGAEA.736977>.. <http://doi.pangaea.de/10.1594/PANGAEA.738239>.. <http://doi.pangaea.de/10.1594/PANGAEA.738240>.. <http://doi.pangaea.de/10.1594/PANGAEA.738241>.. <http://doi.pangaea.de/10.1594/PANGAEA.738242>.. <http://doi.pangaea.de/10.1594/PANGAEA.738246>.. <http://doi.pangaea.de/10.1594/PANGAEA.738255>.. <http://doi.pangaea.de/10.1594/PANGAEA.738263>.. <http://doi.pangaea.de/10.1594/PANGAEA.738265>.. <http://doi.pangaea.de/10.1594/PANGAEA.738279>.. <http://doi.pangaea.de/10.1594/PANGAEA.738282>.. <http://doi.pangaea.de/10.1594/PANGAEA.738377>.. <http://doi.pangaea.de/10.1594/PANGAEA.738441>.. <http://doi.pangaea.de/10.1594/PANGAEA.738561>.. <http://doi.pangaea.de/10.1594/PANGAEA.738562>..



cumulative use of 100 datasets, by repo



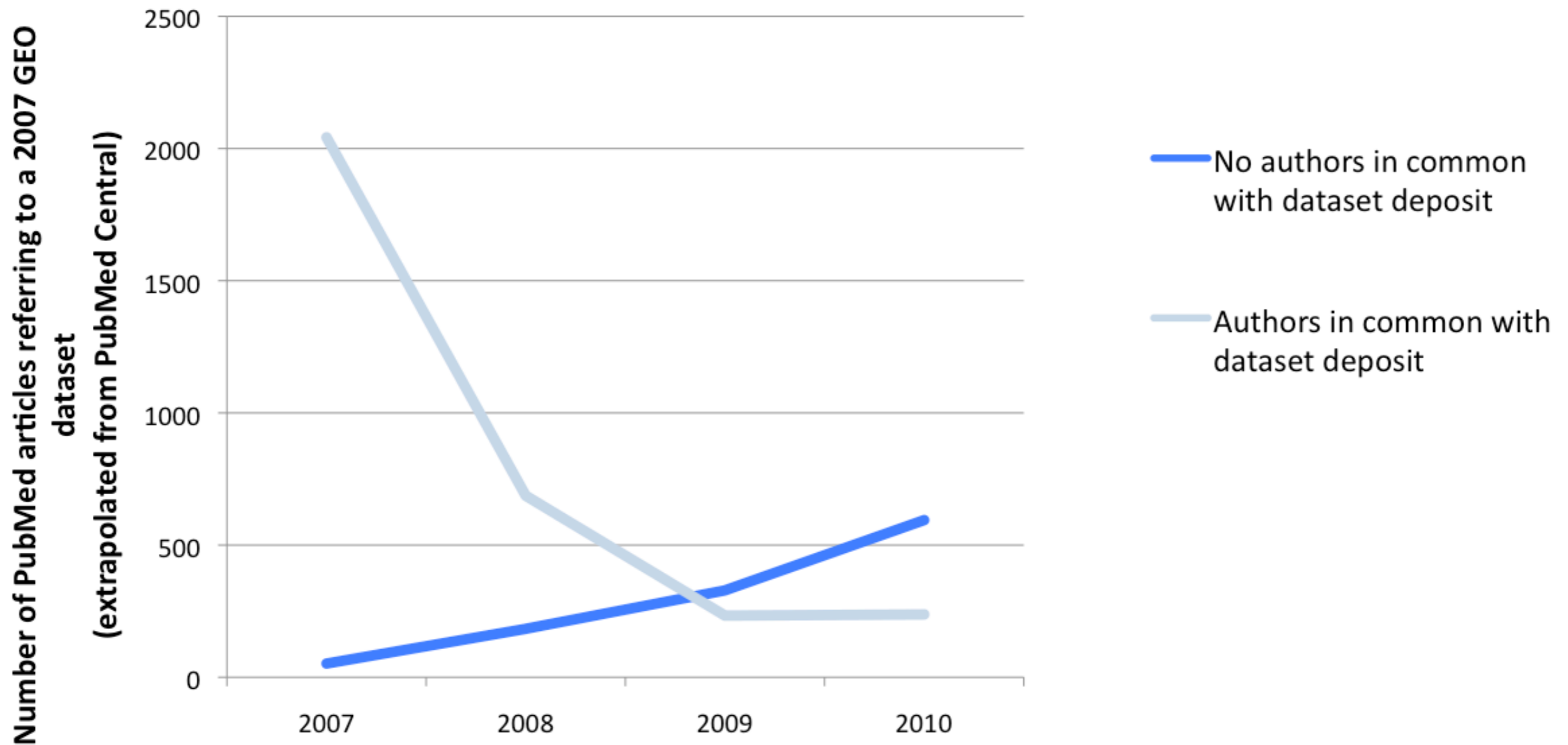
Number of times a 2007 GEO accession was mentioned in PMC, 2007-2010, excluding mentions by original authors



One bar per 2007 GEO dataset
(349 of 2711 GEO datasets had at least one mention in PMC)

1) a new lease on life

Use and reuse of 2007 GEO data attributed by accession reference, extrapolated to all of PubMed



2) more impact per funding dollar

Traditional research funding:

\$400k = 16 papers

At Dryad cost levels,
at similar levels of reuse to GEO,
\$400k would facilitate 1000 reuse papers

A stellar Scientific ROI is in easy reach.

Piwowar, Vision, Whitlock (2011)
Data archiving is a good investment.
Nature 473, 285

Research Remix

May 19, 2011

[Full Text And Details For Nature Letter "Data Archiving Is A Good Investment"](#)

Filed under: Uncategorized — Heather Piwowar @ 12:24 pm

I'm happy to say that we've just had a Letter to the Editor published in *Nature*:



Piwowar, HA, Vision, TJ, & Whitlock, MC (2011). Data archiving is a good investment *Nature*, 473 (7347), 285-285 DOI: [10.1038/473285a](https://doi.org/10.1038/473285a)

<http://researchremix.wordpress.com/2011/05/19/nature-letter/>



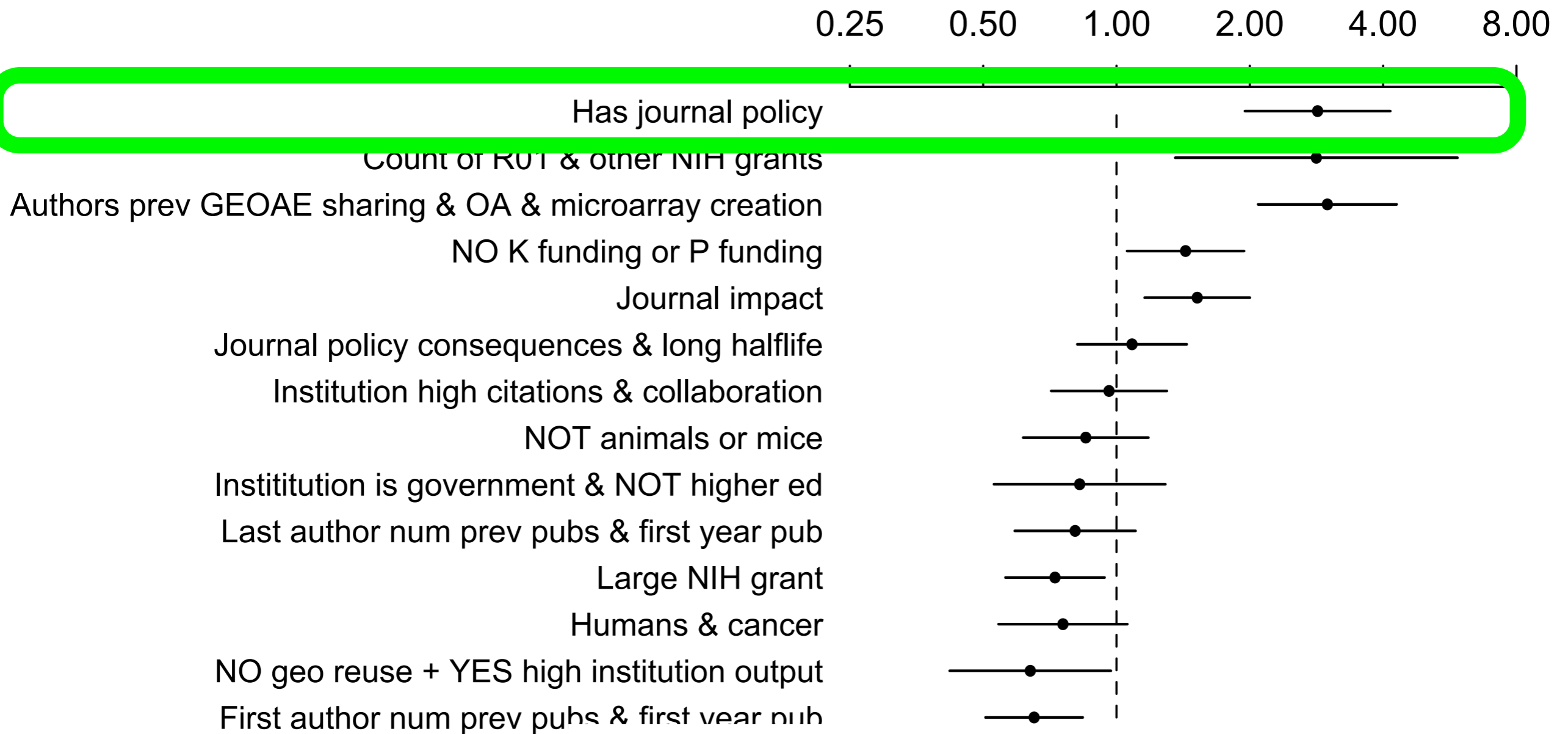
<http://www.flickr.com/photos/davemurr/4592014327/>



<http://www.flickr.com/photos/wwarby/5109443065/>

Multivariate nonlinear regressions with interactions

Odds Ratio



OPEN ACCESS Freely available online

PLoS one

Who Shares? Who Doesn't? Factors Associated with Openly Archiving Raw Research Data

Heather A. Piwowar^{*†}

why should journals care?

drive views and visibility
might boost your citations!

OPEN  ACCESS Freely available online

 PLoS one

Sharing Detailed Research Data Is Associated with Increased Citation Rate

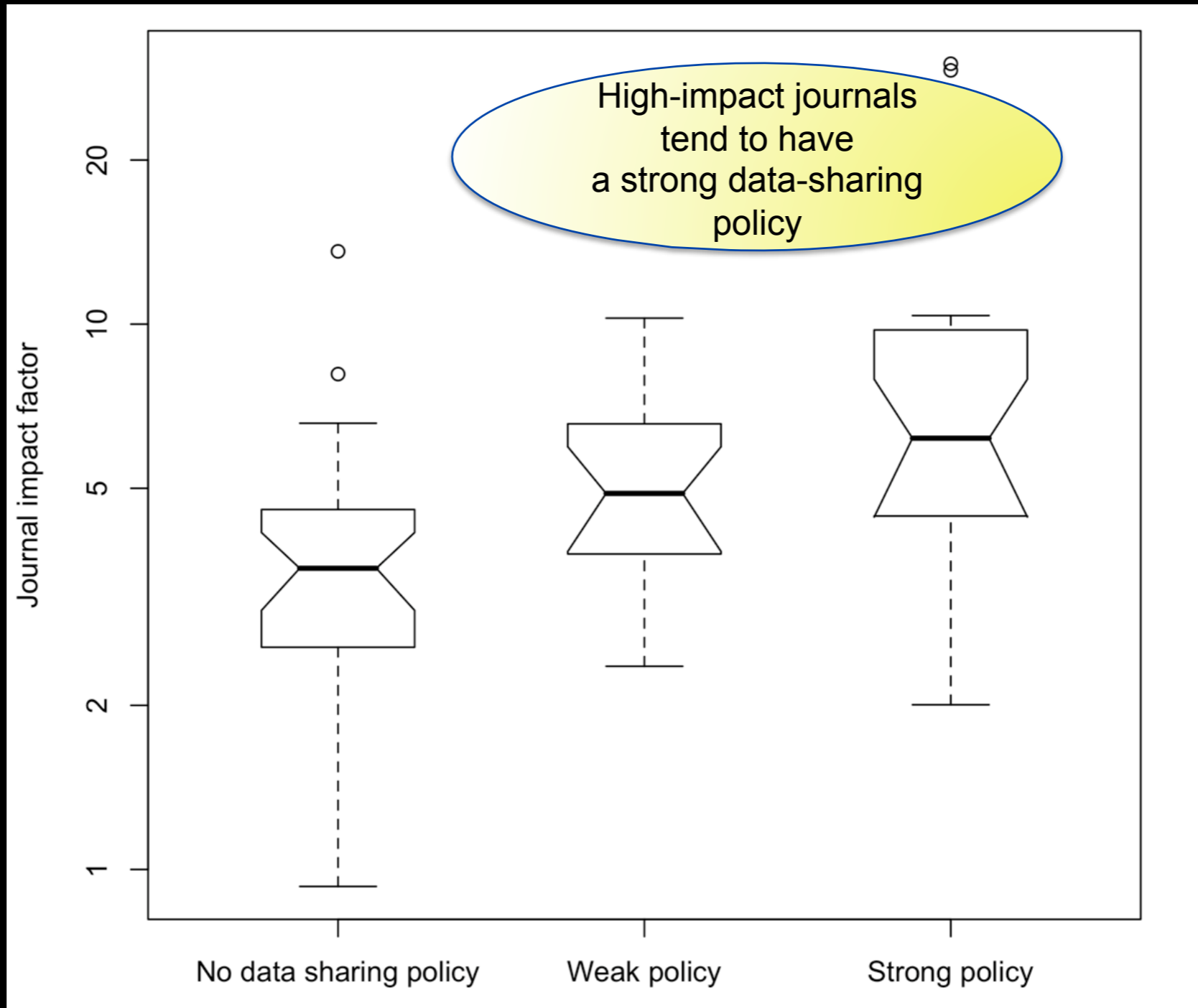
Heather A. Piwowar*, Roger S. Day, Douglas B. Fridsma

Department of Biomedical Informatics, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania, United States of America

puts you in good company



“An inherent principle of publication is that others should be able to replicate and build upon the authors' published claims. Therefore, **a condition of publication in a Nature journal** is that authors are required to make materials, data and associated protocols available in a publicly accessible database ...”



signals that you are serious about quality of research

clarify peer review

standardize costs for supplementary information
while embracing best practices

- preservation
- citation
- discovery
- ...



right now: leading edge

later: lagging edge

not sure? try it.

how can journals start?

Education

Part of the social contract of publication

Data linked to the publication

Upon request doesn't work

Journals are probably not the host for data

Written policies

for authors

for reviews

for copyeditors

for data archiving AND data citation.

Strong Written policies

Joint Data Archiving Policy = JDAP

This Journal requires, as a **condition for publication**, that **data supporting the results** in the paper should be archived in an **appropriate public archive**, such as << list of recommended archives here >>.

Data are important products of the scientific enterprise, and they should be preserved and usable for decades in the future. Authors may elect to have the data publicly available at time of publication, or, if the technology of the archive allows, **may opt to embargo** access to the data for a period up to a year after publication. **Exceptions** may be granted at the discretion of the editor, especially for sensitive information such as human subject data or the location of endangered species.

Make it fun

an award?

an editorial?

an issue on replication?

“Data as topic”

more info?

- Joint Data Archiving Policy (JDAP)
- Dryad Digital Repository (Biology+Medicine)
- Nature's Instr. to Authors on data availability
- ICPSR's "Guide to Social Science Data Preparation and Archiving"
- UK AHRC - Arts & Humanities Research Council requirement for deposit of datasets
- Data repositories: <http://datacite.org/repolist>



Data highlights an issue that is true
for all research dissemination.

Many uses aren't reflected in citations.

A network of ideas: bibliometrics.

In 1961, Garfield creates the Science Citation Index.

- replaces expert judges with crowdsourced judgements
- based on existing patterns of use: **mining, not asking.**
- And that's awesome!

But only part of the picture

1. Only one type of **person**: academics.
2. Only one kind of **resource**: scholarly articles.
3. Only one kind of **use**: using to support a scholarly article.

Web promises new tools for conversation.

reference managers



blogs



social bookmarking



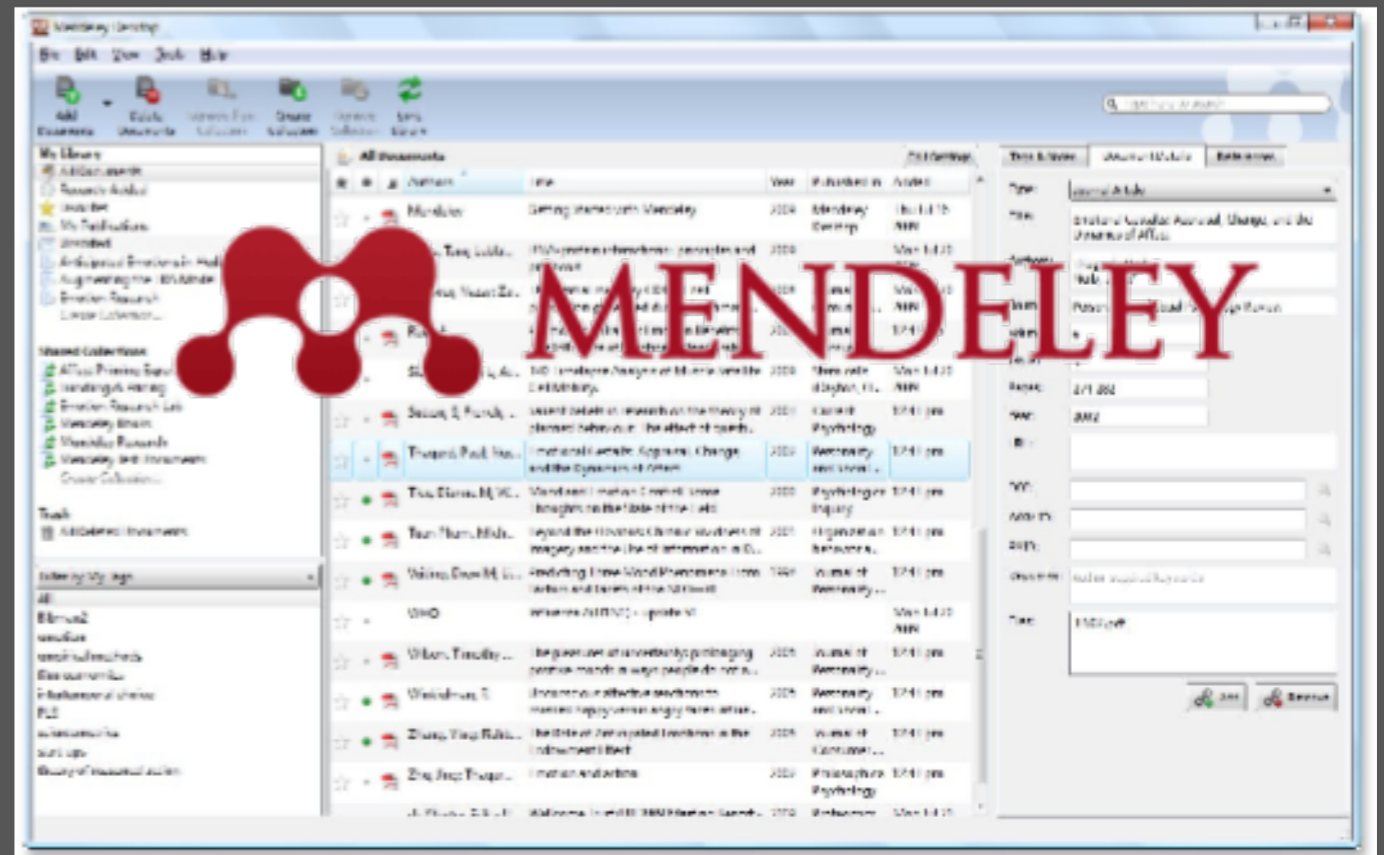
social networks



Examples: Mendeley

1.6 million user libraries

160 million papers
(MEDLINE has 18 million...)



Examples: Twitter

In one month, over 58k citations from Twitter to scholarly articles (citwaitions?)

It is like having a jury preselect what will probably interest you.... Occasionally there will be something that people will link to, and it will change what I think, or what I'm doing, or what I'm interested in.

-study participant

slide by Jason Priem: <http://bit.ly/x2aSI9>



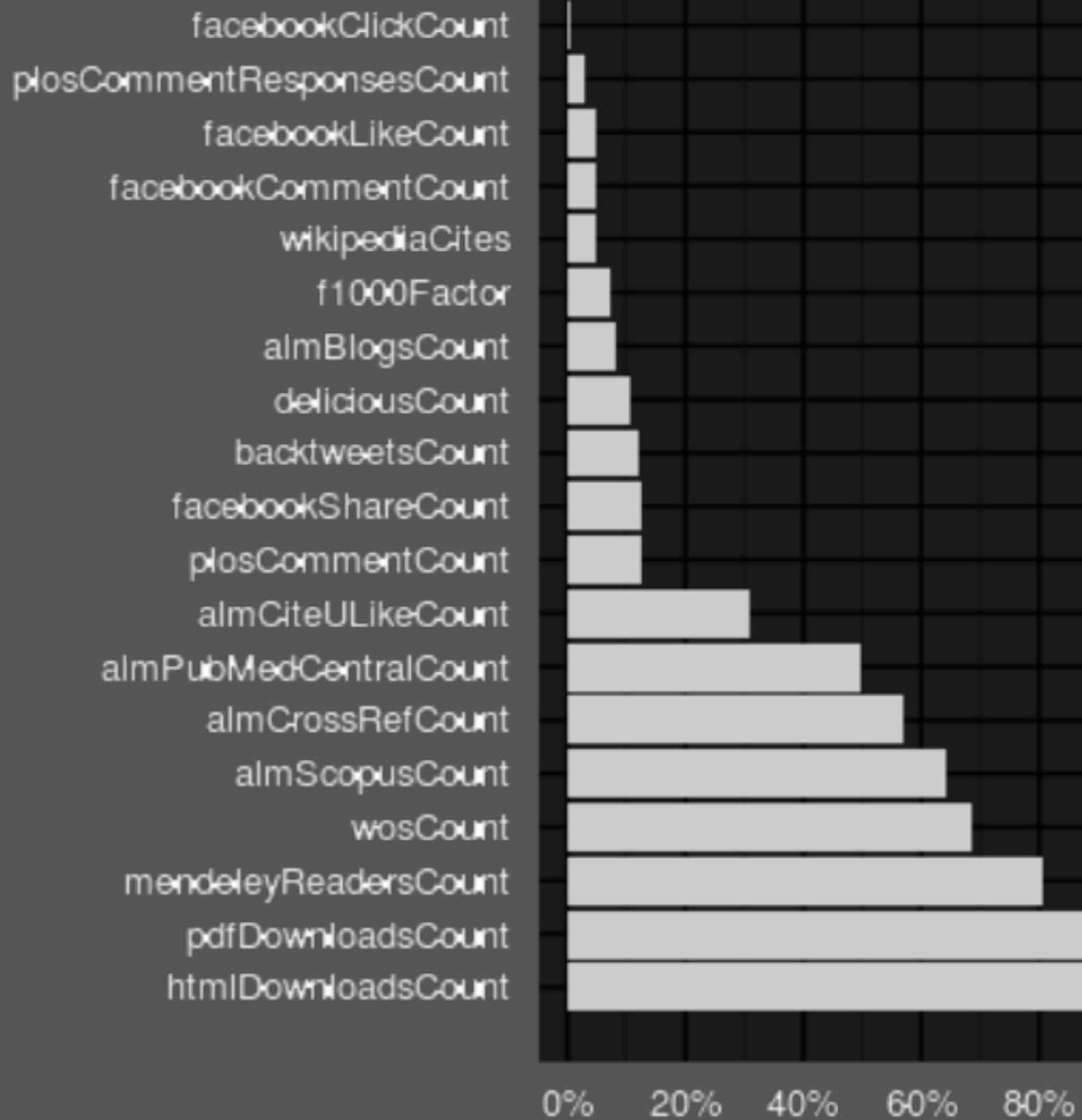
<http://www.flickr.com/photos/pixscapes/4331070047>

Bibliometrics mined impact on
the first scholarly Web.

altmetrics mines
impact on the next
one.

There's lots of altmetrics data out there already.

% articles with nonzero counts, by metric type



altmetrics.org/tools

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citedIn

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Science Card

Uncover the invisible impact of research.

Create a collection of research objects you want to track. We'll provide you a report of the total impact of this collection. You can peruse [a sample report](#) or check out the most [recently shared reports](#).

Collect research objects

Create report

Paste object IDs,

Add one DOI, PubMed ID, URL, or other **supported identifier** per line:

```
10.1371/journal.pcbi.1000361
20334632
2BAK
GSE2109
10.5061/dryad.1295
http://www.carlboettiger.info/research/
ab-notebook
http://www.slideshare.net/phylogenomic
s/eisenall-hands
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Add to collection

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- ▶ GitHub users
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Heather Piwowar

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download data

54 artifacts; updated 5 Dec, 2011

article

Permalink: <http://total-impact.org/collection/sURpEg> copy

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05f22f70-6d0b-11df-afb8-0026b95d30b2

Piwowar, Day, Fridsma (2007) **Sharing Detailed Research Data Is Associated with Increased Citation Rate** *PLoS ONE*.

Piwowar HA, Day RS, Fridsma DB **Data from: Sharing detailed research data is associated with increased citation rate.** *Dryad Data Repository*.



10.1038/npre.2008.1701.1

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Piwowar HA, Chapman WW **Data from: Public sharing of research datasets: a pilot study of associations.** *Dryad Data Repository*.



10.1525/bio.2011.61.8.8

McDade, Maddison, Guralnick, Piwowar, Jameson, Helgen, Herendeen, Hill, Vis (2011) **Biology Needs a Modern Assessment System for Professional Productivity** *BioScience*.



dataset

10.5061/dryad.j1fd7

Piwowar, Vision, Whitlock (0) **Data from: Data archiving is a good use of research funds .**

Piwowar HA, Vision TJ, Whitlock MC **Data from: Data archiving is a good investment.** *Dryad Data Repository.*



10.5061/dryad.j2c4g

Piwowar HA, Day RS, Fridsma DB **Data from: Sharing detailed research data is associated with increased citation rate.** *Dryad Data Repository.*



10.5061/dryad.mf1sd

Piwowar HA **Data from: Who shares? Who doesn't? Factors associated with openly archiving raw research data.** *Dryad Data Repository.*



10.5061/dryad.3td2f

Piwowar HA, Chapman WW **Data from: Public sharing of research datasets: a pilot study of associations.** *Dryad Data Repository.*



why should journals care?

> competitive advantage for authors

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RESEARCH ARTICLE OPEN ACCESS

Sharing Detailed Research Data Is Associated with Increased Citation Rate

Article Metrics Related Content Comments: 5

Article Usage

Total Article Views
21,671
Mar 21, 2007 (publication date)
through Mar 12, 2012*

	HTML Page Views	PDF Downloads	XML Downloads	Totals
PLoS	19,353	1,327	696	21,376
PMC	230	65	n.a.	295
Totals	19,583	1,392	696	21,671

Cumulative Views

*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

SCOPUS	45
CrossRef	35
PMC	14
ISI Web of Science	39
Google Scholar	Search

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Metrics

Total Article Views: **21,671**

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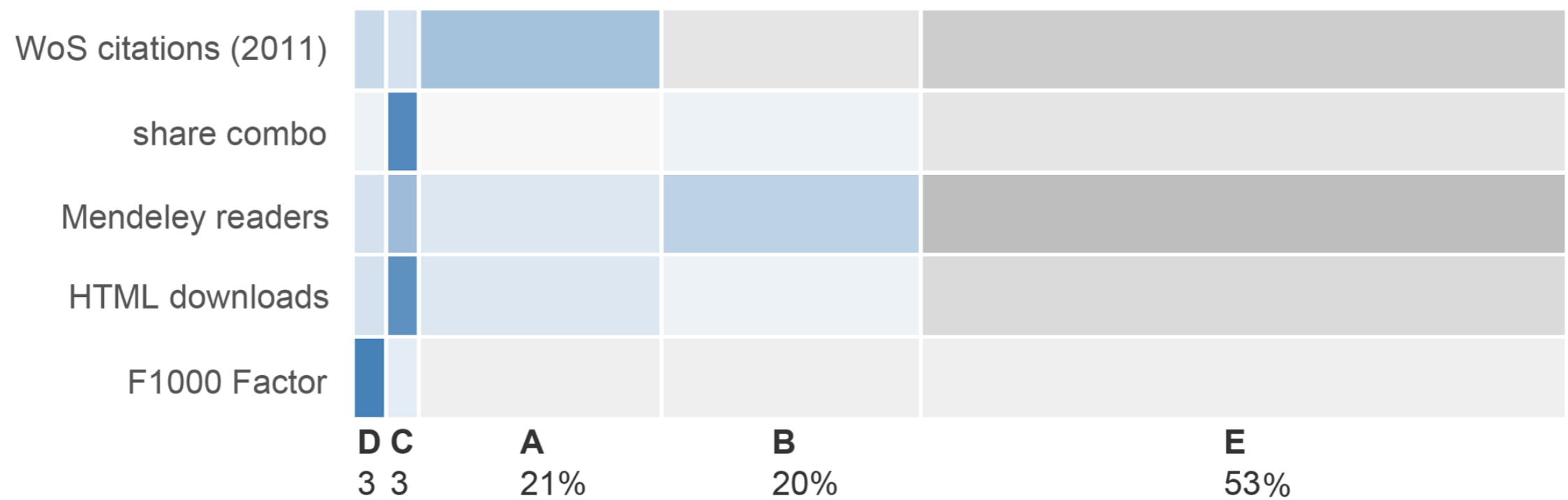
> not just winners and losers

journal impact factor:



altmetrics? ice cream flavors!





> aligns incentives.

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Sharing Detailed Research Data Is Associated with Increased Citation Rate

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Description

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Title : Sharing Detailed Research Data Is Associated with Increased Citation Rate
Author(s) : Heather A. Piowar*, Roger S. Day, Douglas B. Fridsma
Abstract : Sharing research data provides benefit to the general scientific community, but the benefit is less obvious for the investigator who makes his or her data available. We examined the citation history of 85 cancer microarray clinical trial publications with respect to the availability of their data. The 48% of trials with publicly available microarray data received 85% of the aggregate citations. Publicly available data was significantly ($p = 0.006$) associated with a 69% increase in citations, independently of journal impact factor, date of publication, author country of origin using linear regression. This correlation between publicly available data and increased literature impact may further motivate investigators to share their detailed research data.
Keywords : data sharing; open science

Subject : unspecified
Area : Other
Language : English
Year : 2007

Affiliations : DataONE at NESCent
Journal : PLoS ONE
Url : <http://www.plosone.org/article/info:doi/10.1371/journal.pone.0000308>
Doi : 10.1371/journal.pone.0000308

Total Impact ? alpha
19337 html views
1327 pdf views
696 xml views
235 unique ip views
230 html views
65 pdf views
45 citations
35 citations
37 bookmarks
37 bookmarks
16 readers
14 citations
11 abstract views
10 figure views
17 supp data views
6 cited by
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2 groups
2 Facebook

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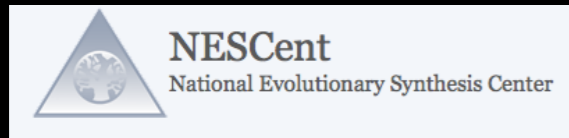
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thank you

Todd Vision: PI of Dryad

Jason Priem: co-PI of total-impact

Also: Mike Whitlock, Jonathan Carlson, Estephanie Sta Maria
The open science online community and those who release
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