

Open Science in Practice

Dr. Peter Kraker
(Open Knowledge
Maps)

Medical University
of Innsbruck,
4 December 2017




OPEN
KNOWLEDGE MAPS



SCIENCE





 OPEN ACCESS

ESSAY

Why Most Published Research Findings Are False

John P. A. Ioannidis

Published: August 30, 2005 • <https://doi.org/10.1371/journal.pmed.0020124>

Article

Authors

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Abstract

Modeling the Framework
for False Positive
Findings

Bias

Abstract

Summary

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Related PLOS Articles

Modeling the Framework for False Positive Findings

Over half of psychology studies fail reproducibility test

Largest replication study to date casts doubt on many published positive results.

Monya Baker

27 August 2015

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Don't trust everything you read in the psychology literature. In fact, two thirds of it should probably be distrusted.

In the biggest project of its kind, Brian Nosek, a social psychologist and head of the Center for Open Science in Charlottesville, Virginia, and 200



Previous post

[Cool climate paper sinks journal editor](#)

Next post

[Illegal drug sales threaten vultures in India](#)

NEWS BLOG

Reliability of 'new drug target' claims called into question

[05 Sep 2011](#) | [14:59 GMT](#) | Posted by [Brian Owens](#) | Category: [Biology & Biotechnology](#)

Cross posted from [Nature Reviews Drug Discovery](#) on behalf of Asher Mullard.

Bayer halts nearly two-thirds of its target-validation projects because in-house experimental findings fail to match up with published literature claims, finds a first-of-a-kind analysis on data irreproducibility.

CURATED BY Roger Davis et al.

Reproducibility Project: Cancer Biology

Investigating reproducibility in preclinical cancer research.

COLLECTION Dec 10, 2014

The Reproducibility Project: Cancer Biology is an initiative to independently replicate selected results from a number of high-profile papers in the field of cancer biology. For each paper a Registered Report detailing the proposed experimental designs and protocols for the replications is peer reviewed and published prior to data collection; the results of these experiments are then published as a Replication Study. The project is a collaboration between the

[The Scientist](#) » [News & Opinion](#) » [Daily News](#)

Replication Complications

An initiative to replicate key findings in cancer biology yields a preliminary conclusion: it's difficult.

By Ruth Williams | January 18, 2017

Publication bias & lack of data sharing
~92% positive & ~70% failure
Fanelli (2010); Wicherts et al. (2006)

Publish experiment

Specify hypotheses

Lack of replication
1 in 1000 papers
Makel et al. (2012)

HARKing
~50-90% prevalence
John et al. (2012); Kerr (1998)

Interpret data

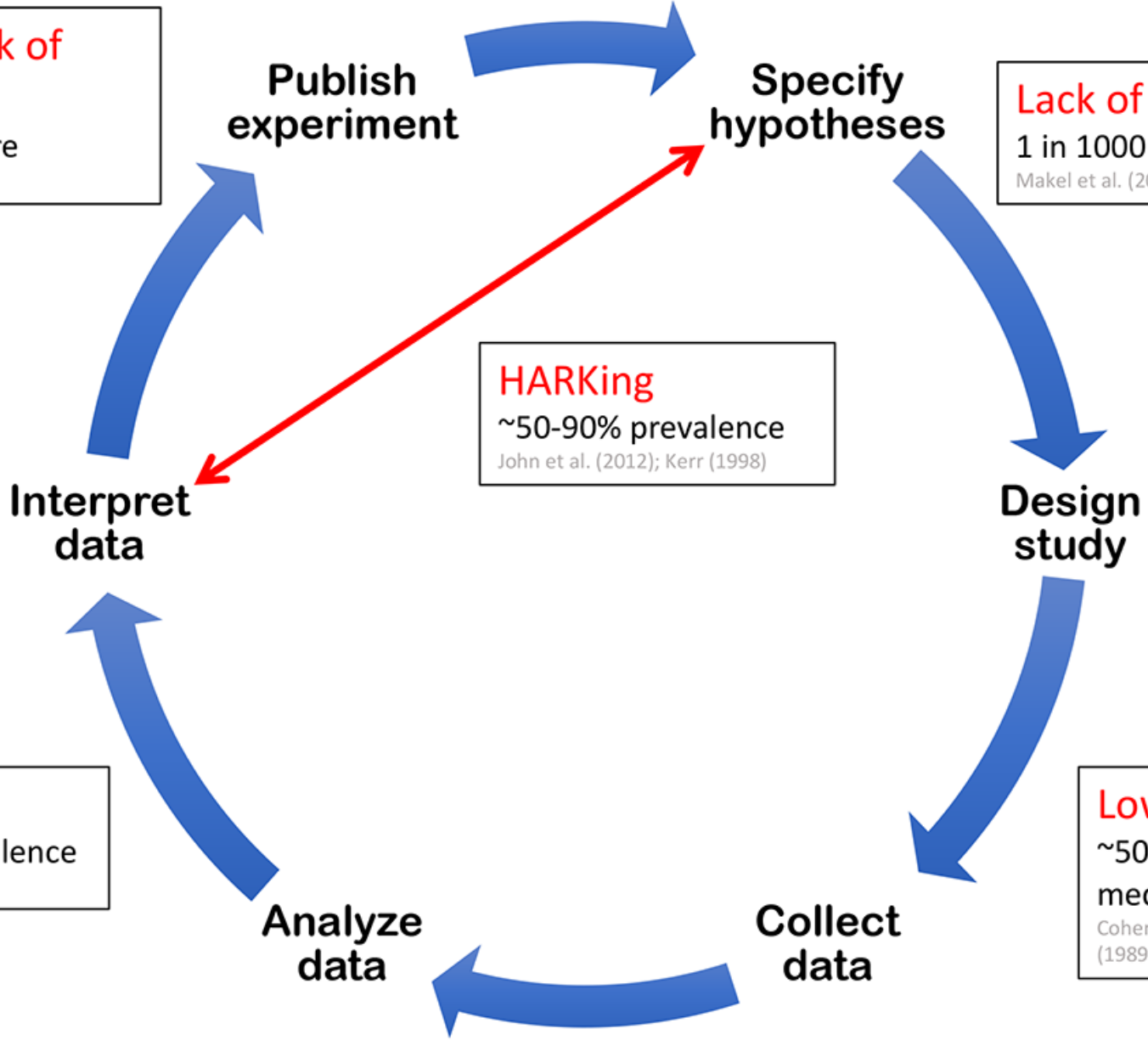
Design study

P-hacking
~50-100% prevalence
John et al. (2012)

Analyze data

Collect data

Low statistical power
~50% chance to detect medium effects
Cohen (1962); Sedlmeier & Gigerenzer (1989); Bezeau & Graves (2001)





open science

Open Science: Definition

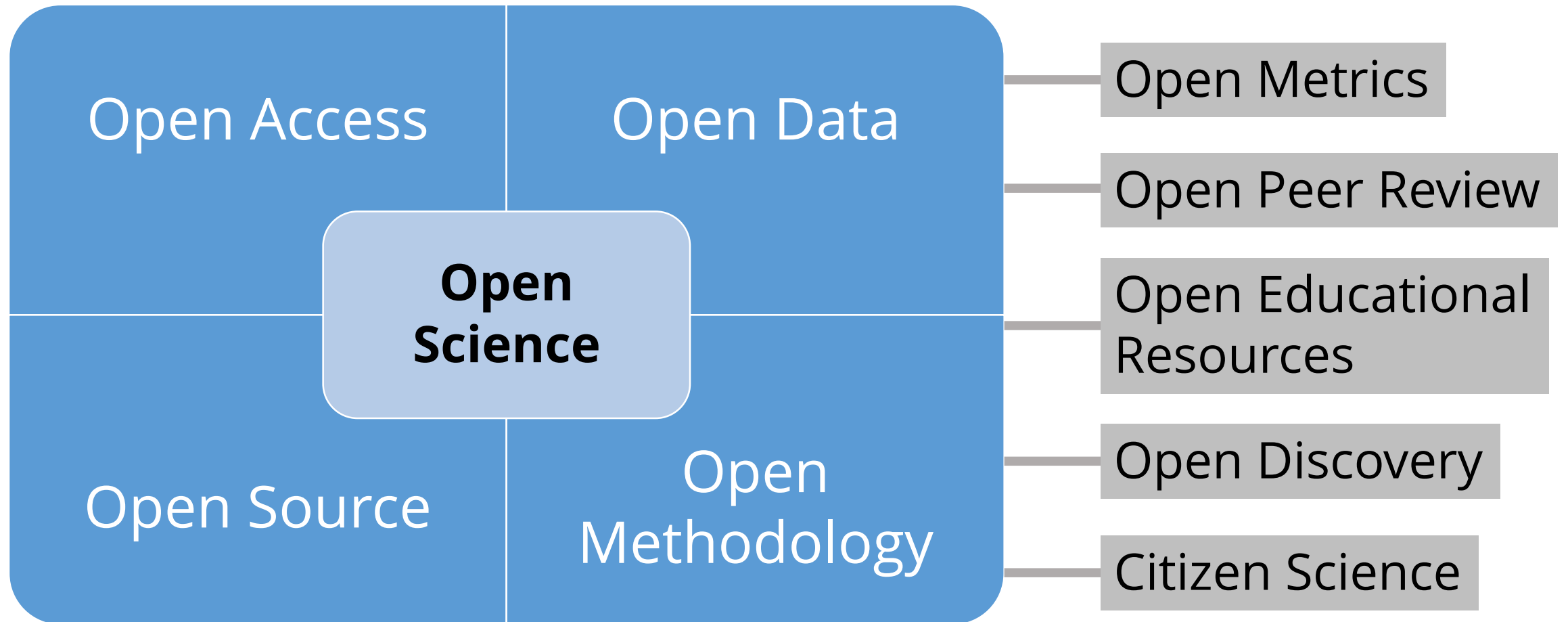
Open Science means **opening up the research process**

by **making all of its outcomes**, and the way in which these outcomes were achieved,

publicly available on the World Wide Web

(Kraker et al. 2011)

Open Science: Instruments



Vienna PRINCIPLES

a vision for scholarly communication

- | | | |
|-------------------|---------------------|-----------------------|
| 1 Accessibility | 5 Transparency | 9 Evaluation |
| 2 Discoverability | 6 Understandability | 10 Validated Progress |
| 3 Reusability | 7 Collaboration | 11 Innovation |
| 4 Reproducibility | 8 Quality Assurance | 12 Public Good |

Preregistration

Science
Head quarters

Psychology's 'registration revolution'

Moves to uphold transparency are not only making psychology more scientific – they are harnessing our knowledge of the mind to strengthen science

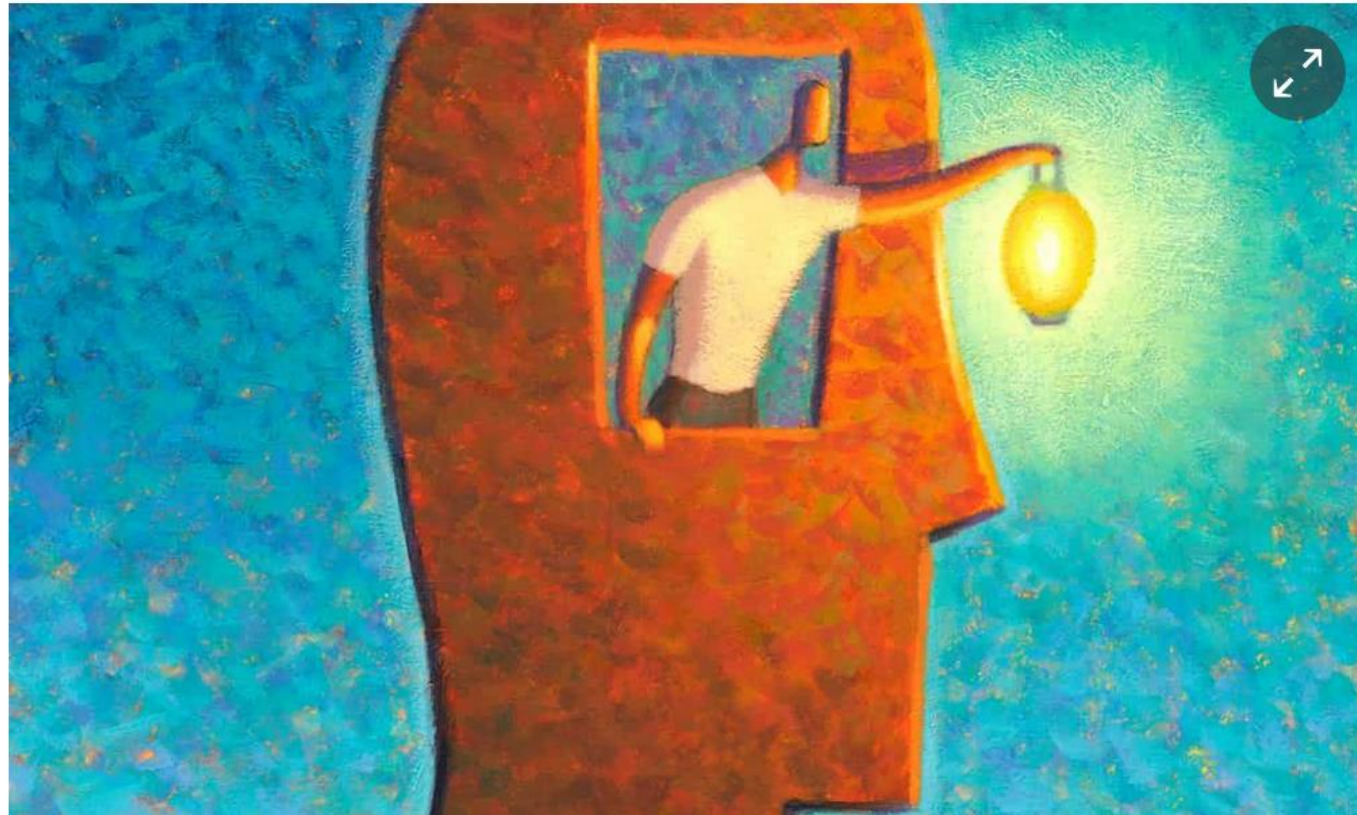


527 9

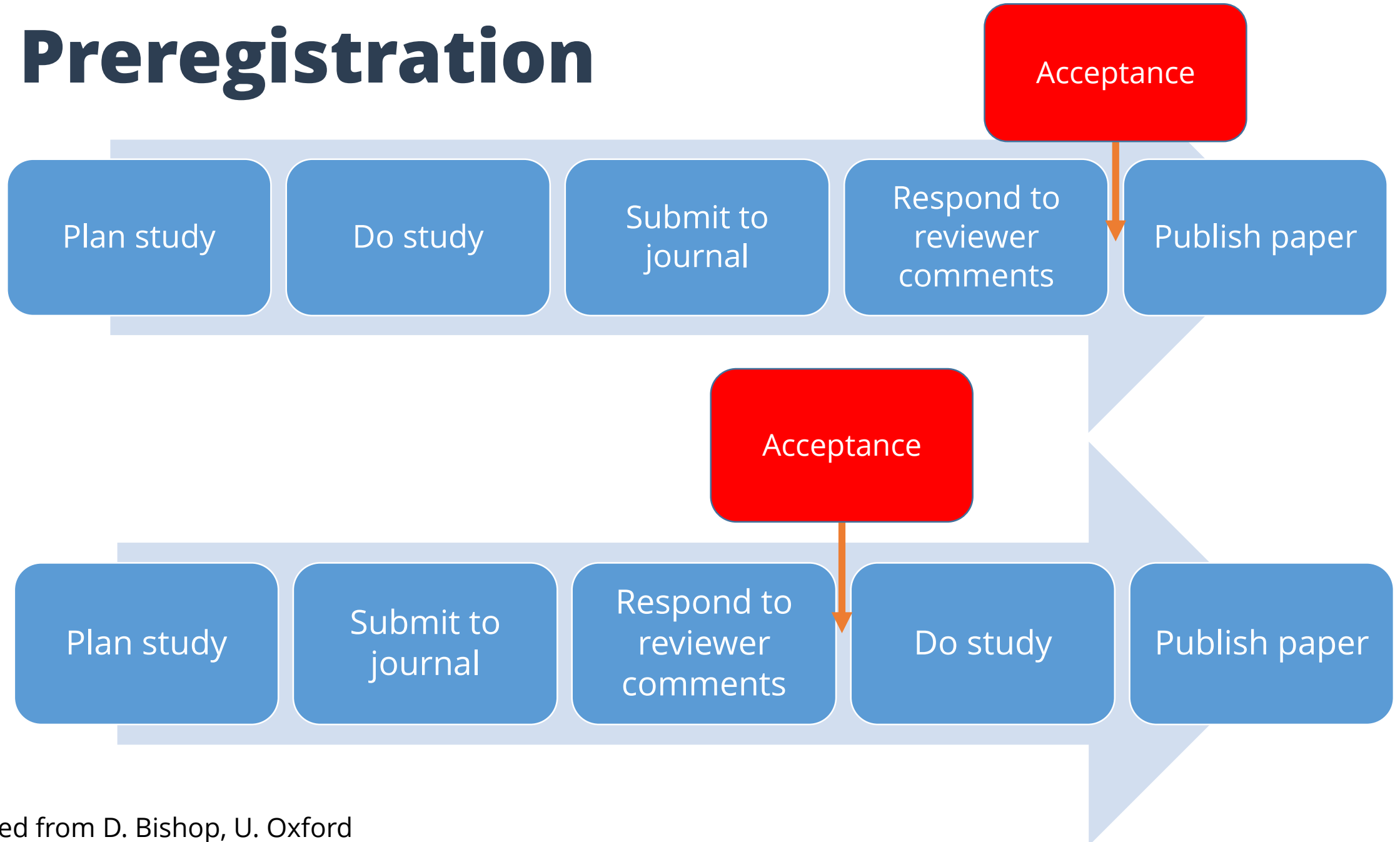
Chris Chambers

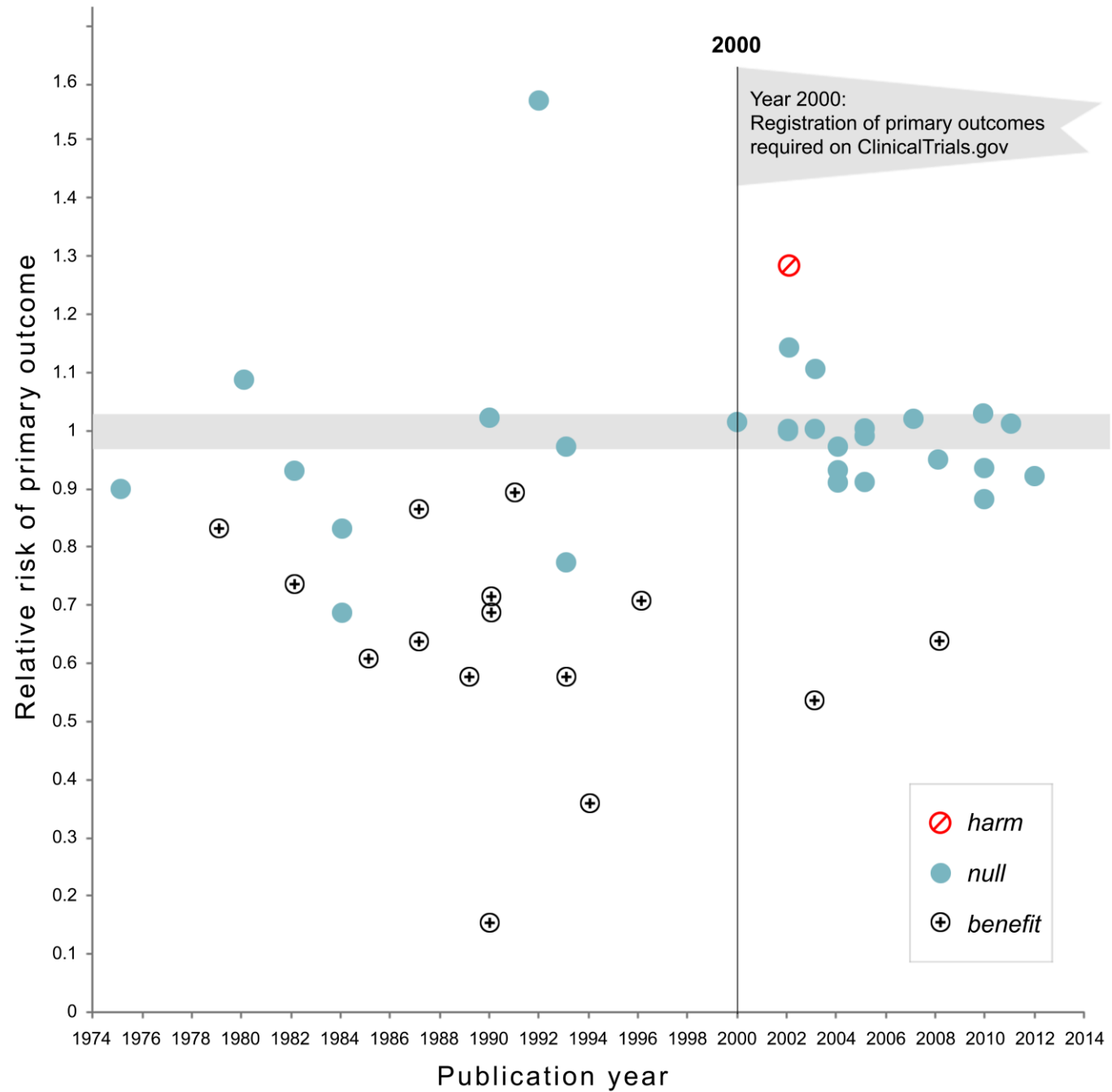
 @chrisdc77

Tuesday 20 May 2014
07.15 BST



Preregistration





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Preregistration makes your science better.

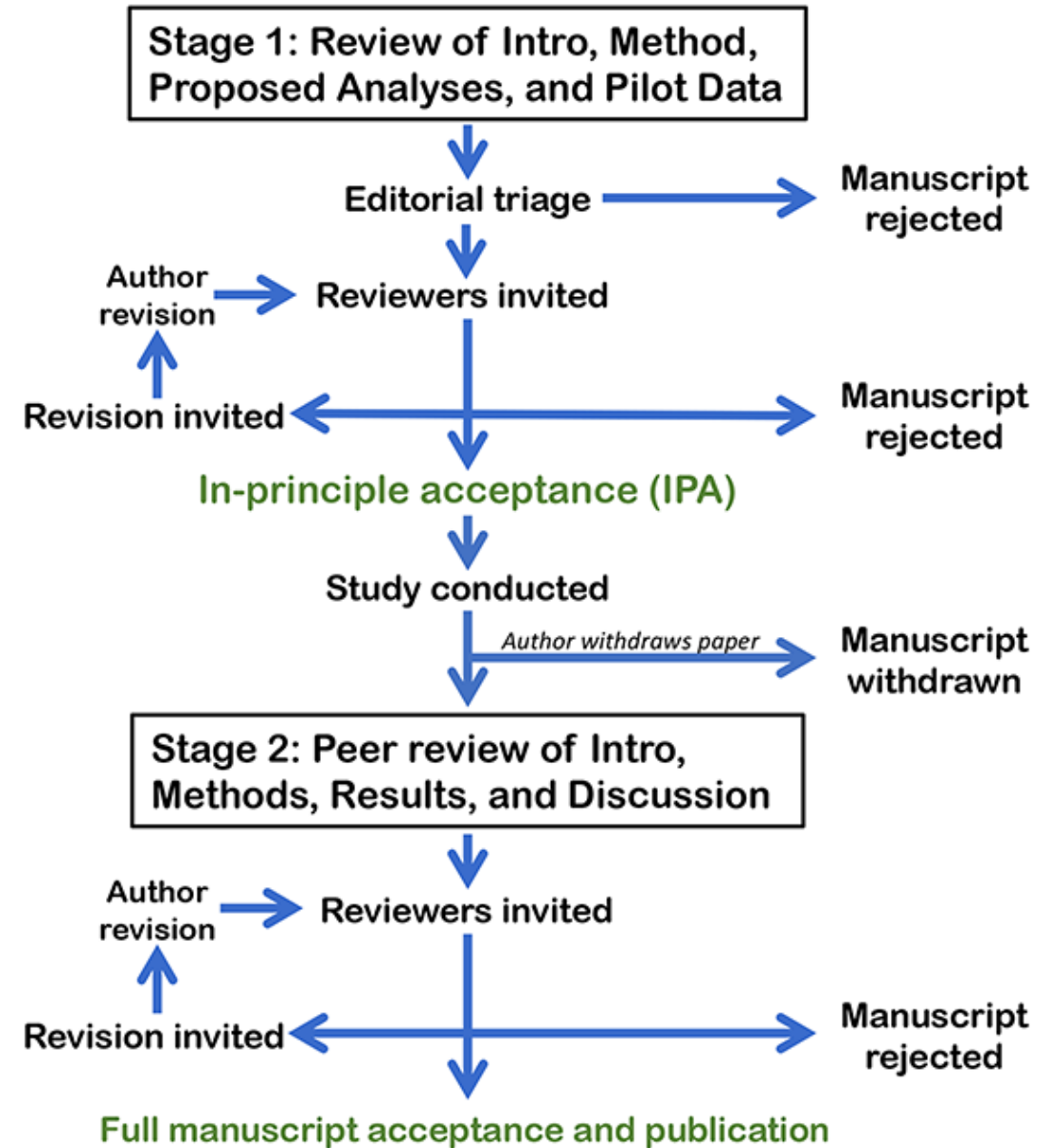


If you have a project that is entering the planning or data collection phase, we'd like you to try out a preregistration. Through our **\$1 Million Preregistration Challenge**, we're giving away \$1,000 to 1,000 researchers who preregister their projects before they publish them. It's straightforward to complete and will really enhance your research output.

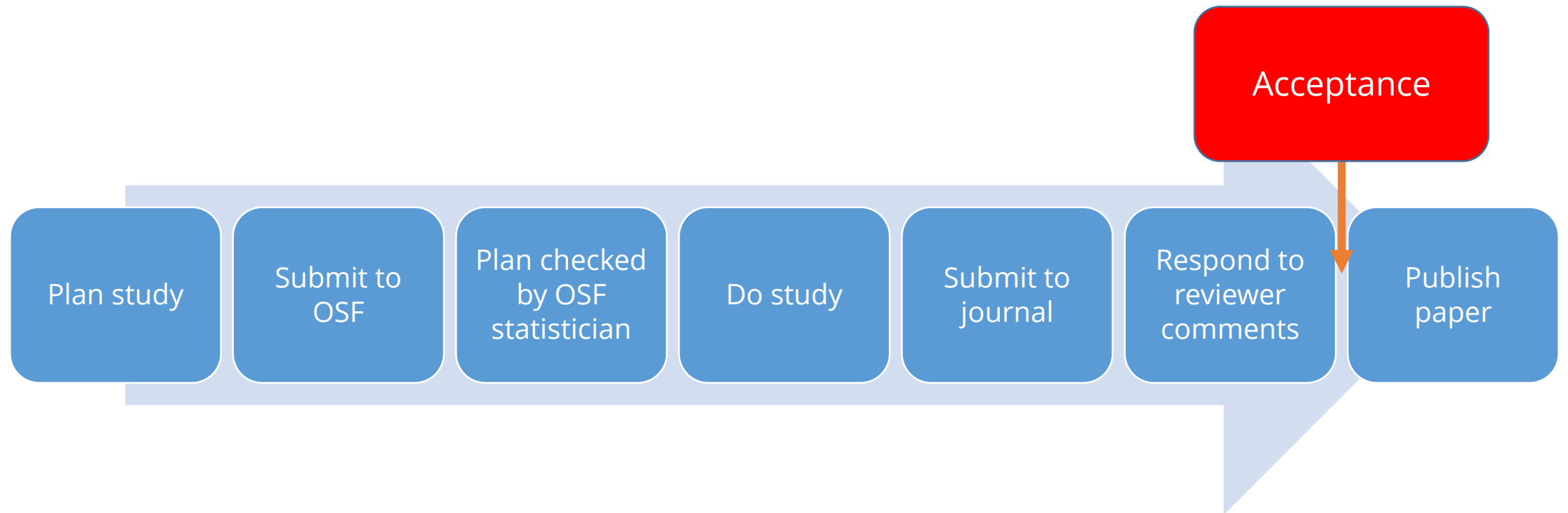
Registered Reports



<https://cos.io/rr/>



Preregistration “light”



<https://cos.io/prereg/>



Edit draft registration

Study Information

Sampling Plan

Variables

Design Plan

Analysis Plan

Scripts

Other

In this section we'll ask you to describe how you plan to collect samples, as well as the number of samples you plan to collect and your rationale for this decision. Please keep in mind that the data described in this section should be the actual data used for analysis, so if you are using a subset of a larger dataset, please describe the subset that will actually be used in your study.

Existing Data (required)

Preregistration is designed to make clear the distinction between confirmatory tests, specified prior to seeing the data, and exploratory analyses conducted after observing the data. Therefore, creating a research plan in which existing data will be used presents unique challenges. Please select the description that best describes your situation. Please do not hesitate to contact us if you have questions about how to answer this question (prereg@cos.io).

 Registration prior to creation of data ⓘ

Advantages of preregistration

No guarantee of publication - but reviewers generally positive about preregistered papers

Free methodological/statistical consulting:
http://cos.io/stats_consulting

Benefits of having well-worked out plan – less stress when it comes to making sense of data

Errors get detected early in the process

And...

PREREGISTER



PREREGISTRATION CHALLENGE

Open access

Online research outputs that are **free of all restrictions on access** (e.g. access tolls) and **free of many restrictions on use** (e.g. certain copyright and license restrictions) [Wikipedia]

Open Definition

“Open means anyone can freely access, use, modify, and share for any purpose (subject, at most, to requirements that preserve provenance and openness).”

Roads to open access

Gold Road: open access at the publisher



Choose the right journal for your research



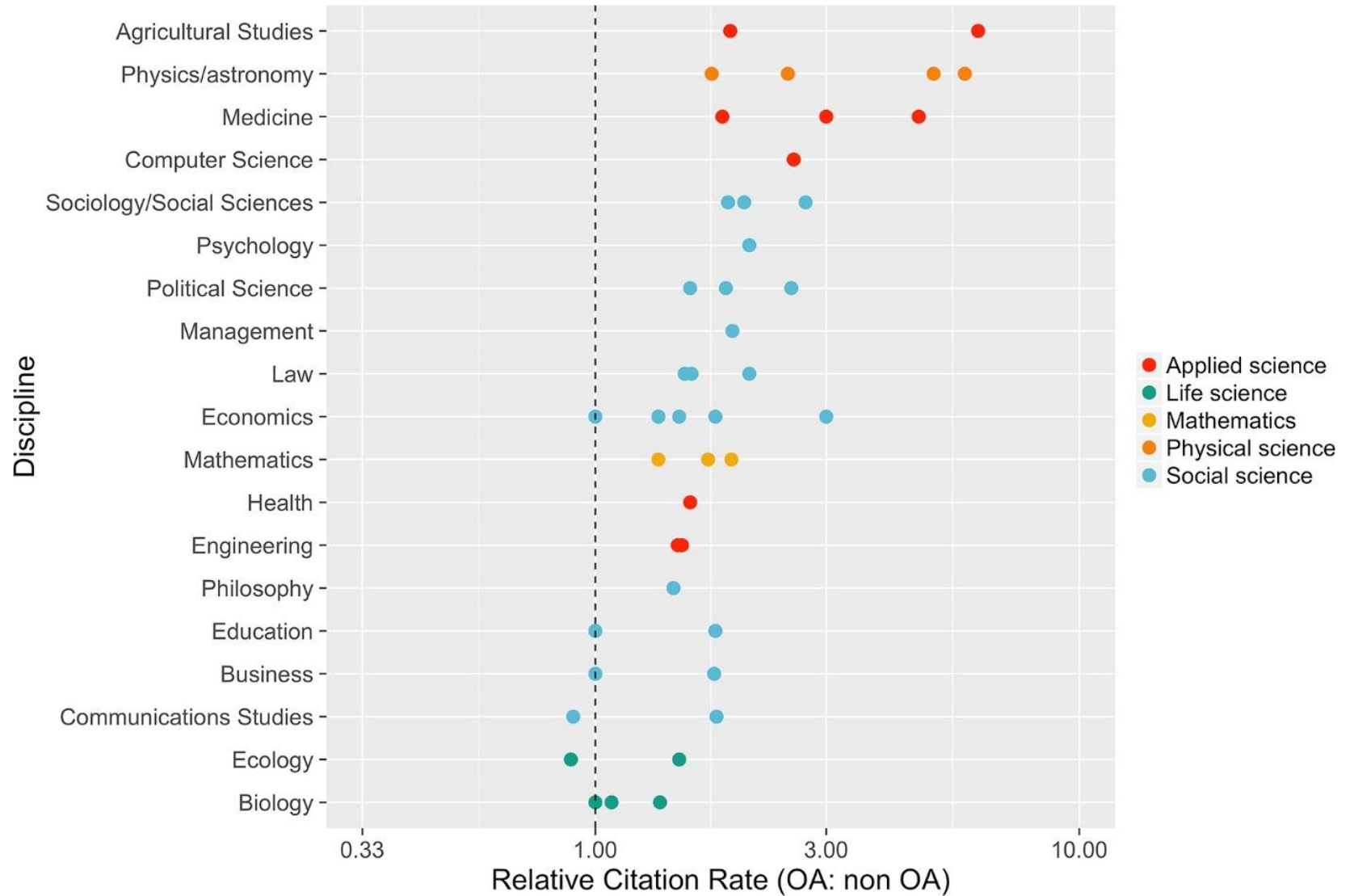
Green Road: self-archiving in repositories



Publisher copyright policies & self-archiving

ROME colour	Archiving policy
green	can archive pre-print <i>and</i> post-print or publisher's version/PDF
blue	can archive post-print (ie final draft post-refereeing) or publisher's
yellow	can archive pre-print (ie pre-refereeing)
white	archiving not formally supported

Open access articles get more citations



McKiernan et al. (2016)

Open Access Advanced: Preprints

Depositing your work in a repository prior to submitting it to a conference or journal

AgriXiv

arXiv.org

bioRxiv



preprints



Adapted from B. Kramer & J. Bosman (U. Utrecht)

Advantages of preprints



CC-BY knitgirl

open access
success stories

<http://www.oastories.org/>



JOHN JAY RESEARCH **John Jay Research** @JohnJ... 1d
#altmetrics & traditional citations not found to be correlated (by Peters et al, 2007? will verify) @megwacha @robincamille @PlumAnalytics
Details

JOHN JAY RESEARCH **John Jay Research** @JohnJ... 1d
@megwacha @robincamille @PlumAnalytics Peters et al 2014. Will provide cite as soon as able.
View



Megan Wacha
@megwacha

@JohnJayResearch @robincamille @PlumAnalytics I think this is it arxiv.org/abs/1501.03342 & we can read it because it's available #openaccess!

8:20pm · 4 May 2015 · Twitter for iPhone

1 FAVORITE



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Viewpoint

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November 30, 2017

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Medical Preprints—A Debate Worth Having

David M. Maslove, MD, MS^{1,2}

» Author Affiliations | Article Information

JAMA. Published online November 30, 2017. doi:10.1001/jama.2017.17566

Following a similar movement in other academic fields, most notably the physical sciences and computing, biomedical researchers are increasingly exploring the use of preprint servers to rapidly disseminate their scholarly output.¹⁻³ Preprint servers consist of online repositories that make scientific manuscripts available to view and cite, without prior external peer review. The largest and most popular site for preprints, arXiv.org, began accepting papers in 1991, and now contains more than 1.3 million articles from the physical sciences, with nearly 1 billion downloads as of August 2017.⁴ More recently, bioRxiv.org has begun to offer preprint services for



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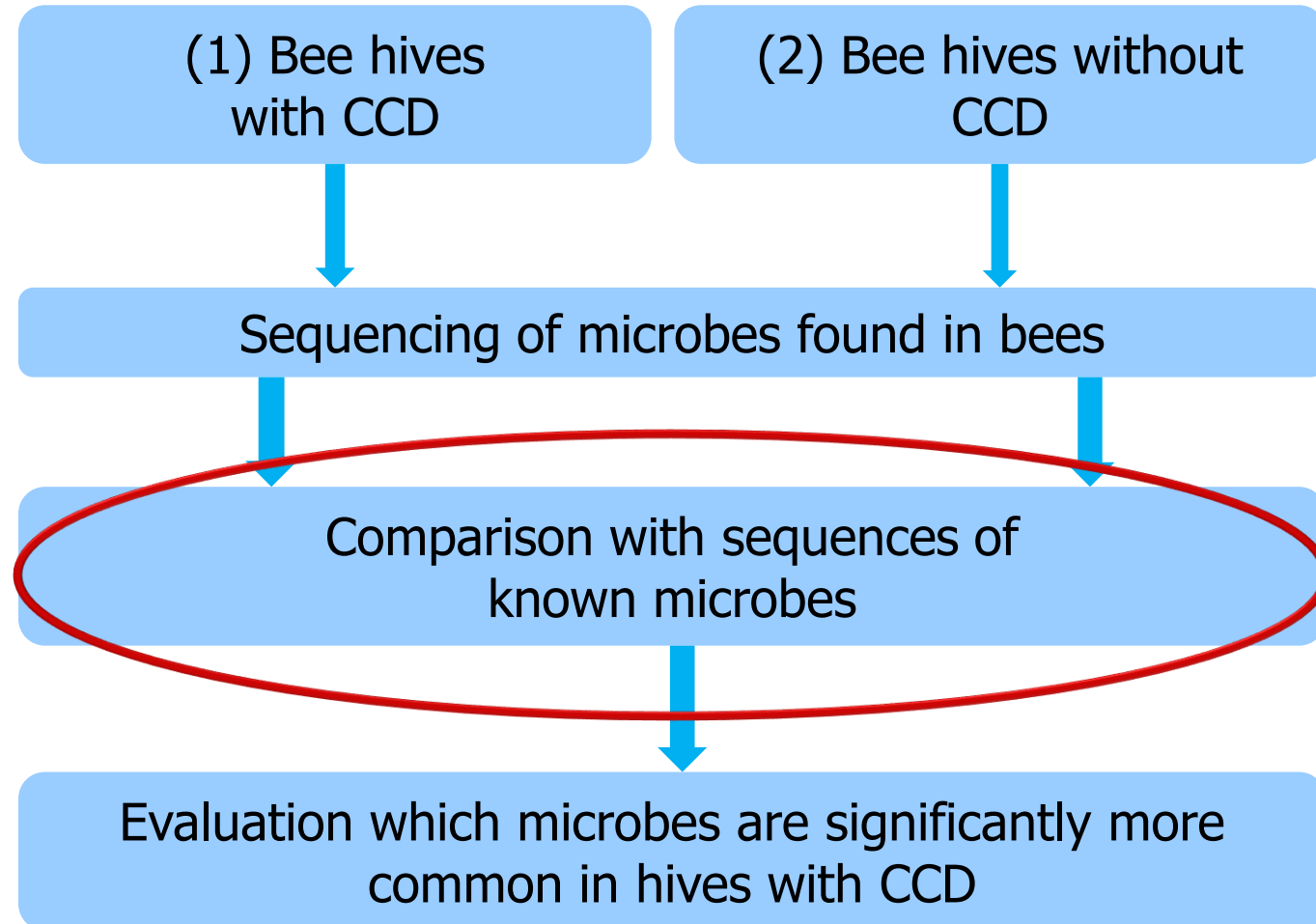
Ex-FDA Chief Robert Califf, MD, Heads to Silicon Valley

July 11, 2017

Opinion



Researching the Reason for the Colony Collapse Disorder (CCD)



Genomic Sequencing Data

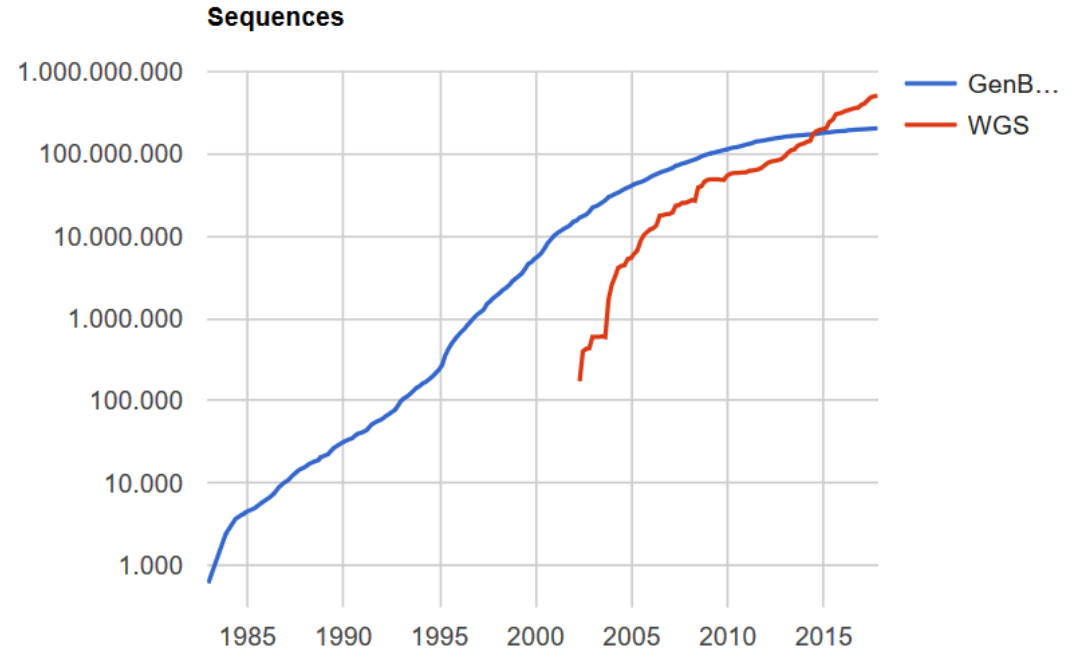
Bermuda Rules

“Primary Genomic Sequence Should be **in the Public Domain**”

“Primary Genomic Sequence Should be **Rapidly Released**”

International collaboration

- EMBL-Bank (Europe)
- GenBank (USA)
- DNA Data Bank of Japan



Disclaimer: This is an early beta prototype. If you find any error, with data or functionality, please let us know via this page.

[Explore](#)[Contribute Data](#)[About](#)[Data](#)[Statistics](#)[Login](#)

All the data, on all the trials

OpenTrials is a linked database for all the available information, on every trial ever conducted. It is built and updated with your help.

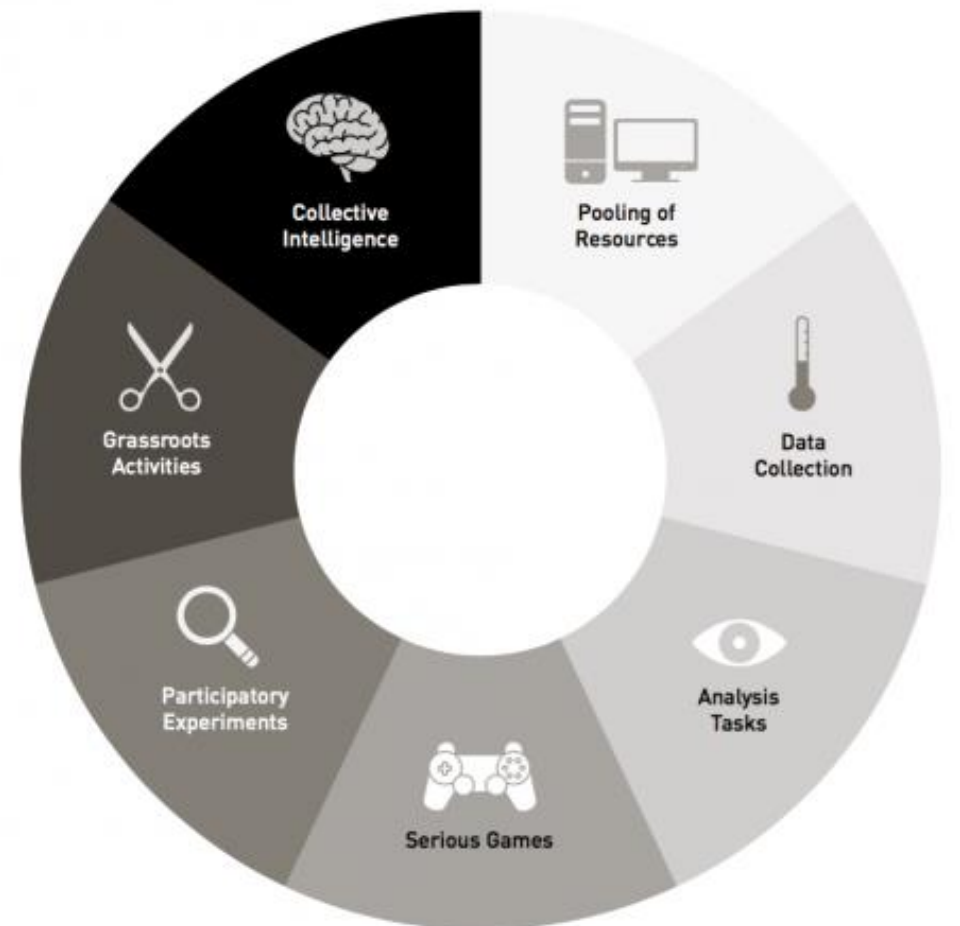


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Citizen science

Scientific research conducted, in whole or in part, by amateur (or nonprofessional) scientists [Wikipedia]



TELL US!

WHAT QUESTIONS ABOUT MENTAL HEALTH DOES RESEARCH
NEED TO ANSWER?

[▶ SEE PROCESS DOCUMENTATION](#)





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Cure in Mind. Cure in Sight.

Citizen Science

Citizen Science wird weltweit unterschiedlich definiert. Einen Überblick der Konzepte und Ideen finden Sie unter "Was ist Citizen Science?"



NEU: VARROAWARNDIENST AUF "ÖSTERREICH FORSCHT"

NEU: Varroawarndienst auf "Österreich forscht" Bienen sind Insekten, mit denen uns schon lange eine intensive Beziehung verbindet. Sie bestäuben nicht nur (gemeinsam mit vielen anderen Insekten) unsere Nutz- und Zierpflanzen, sondern liefern uns auch köstlichen Honig. Doch in den letzten Jahren...

[weiterlesen..](#)

Anzahl: 53

Projekte

Teilnahme:

- Teilnahme offen
- Teilnahme geschlossen

Thema:





educational technology



Scholar

About 2,450,000 results (0.05 sec)

Articles

Legal documents

Any time

Since 2012

Since 2011

Since 2008

Custom range...

Sort by relevance

Sort by date

include patents

include citations

Create alert

[CITATION] Time for Results: Task Force on Leadership and Management
, Task Force on **Educational Technology**... - 1986 - National Governors' Association ...
Cited by 385 Related articles Cite

[Thinking **Technology**: Toward a Constructivist Design Model.](#)

DH Jonassen - **Educational technology**, 1994 - ERIC

Abstract: Discussion of constructivism and instructional design focuses on the development of a design model for constructivist environments that supports the construction of knowledge, a meaningful context for learning, and collaboration among learners and with ...
Cited by 918 Related articles BL Direct Cite More ▾

[Conditions That Facilitate the Implementation of **Educational Technology** Innovations.](#)

DP Ely - **Educational Technology**, 1999 - ERIC

Abstract: Describes eight conditions that facilitate implementation of the **technology**-based change process: dissatisfaction with the status quo, existence of knowledge and skills, availability of resources, availability of time, existence of rewards or incentives, ...
Cited by 211 Related articles BL Direct Cite More ▾

[BOOK] [Integrating **educational technology** into teaching](#)

MD Roblyer, J Edwards, MA Havriluk - 2006 - lavoisier.fr

... Imprimer la notice. Integrating **educational technology** into teaching (4th ed). Auteur : ROBLYER Margaret. Prix indicatif 89,72 €. Disponible chez l'éditeur (délai d'approvisionnement : 10 jours). ...
Paperback. Sommaire d'Integrating **educational technology** into teaching (4th ed) : ...
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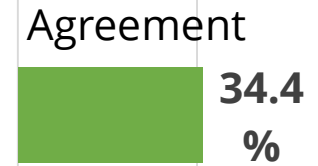
1 2 3 4 5 6 7 8 9 10

[Weiter](#)

Academic literature search tools (ALST) only serve a third or less

n=107

I find it easy to identify relevant publications using ALST



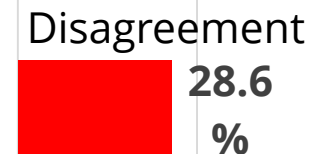
I find it easy to formulate a query when searching in an unknown research topic/field

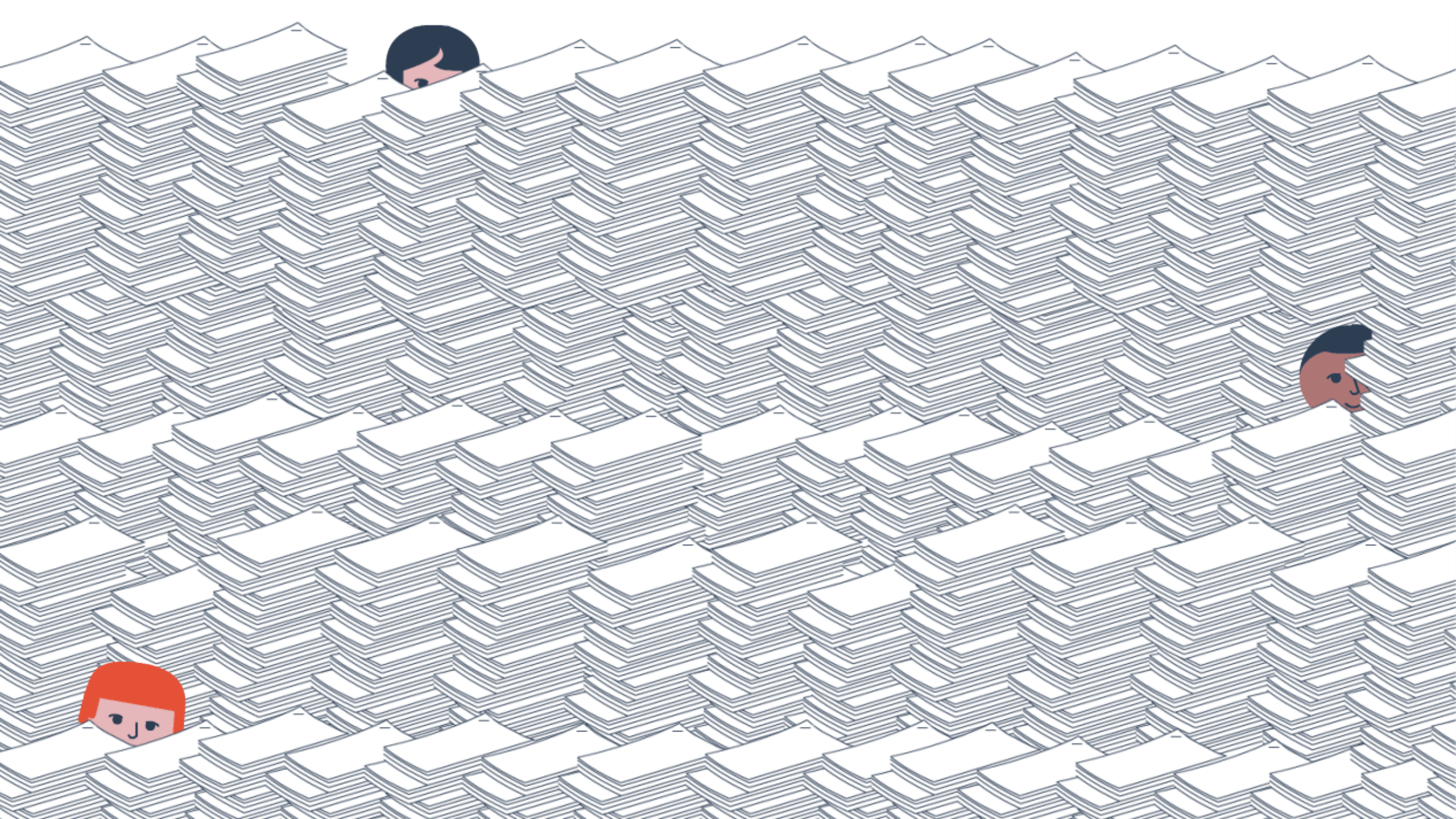


I find it hard to get an overview of academic literature on a research topic using ALST



Academic literature search takes too much time





Dark Knowledge

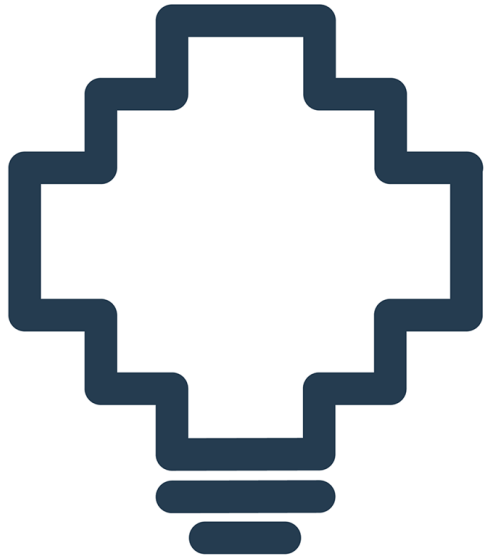
(Jonathan Jeschke)



**It's time to change
the way we discover
research**

Identify relevant concepts

irrelevant



OPEN KNOWLEDGE MAPS

LWL, KNN, K-nearest neighbour

Document Term Matrix, Support Vector Machine, Feature Extraction

Text Mining, Classification, Social Networking Sites

Text Documents, Text Mining, Affinity Propagation

CSI, Distributed data mining, Privacy preserving data mining

Frequent patterns, Meta data conceptual mining

K-means, J48, Hotspot

Cooperation, Figure, Networks

Web Structural Mining (WSM), Data mining, Hyperlink

Loan Default, Time series, Tax administration

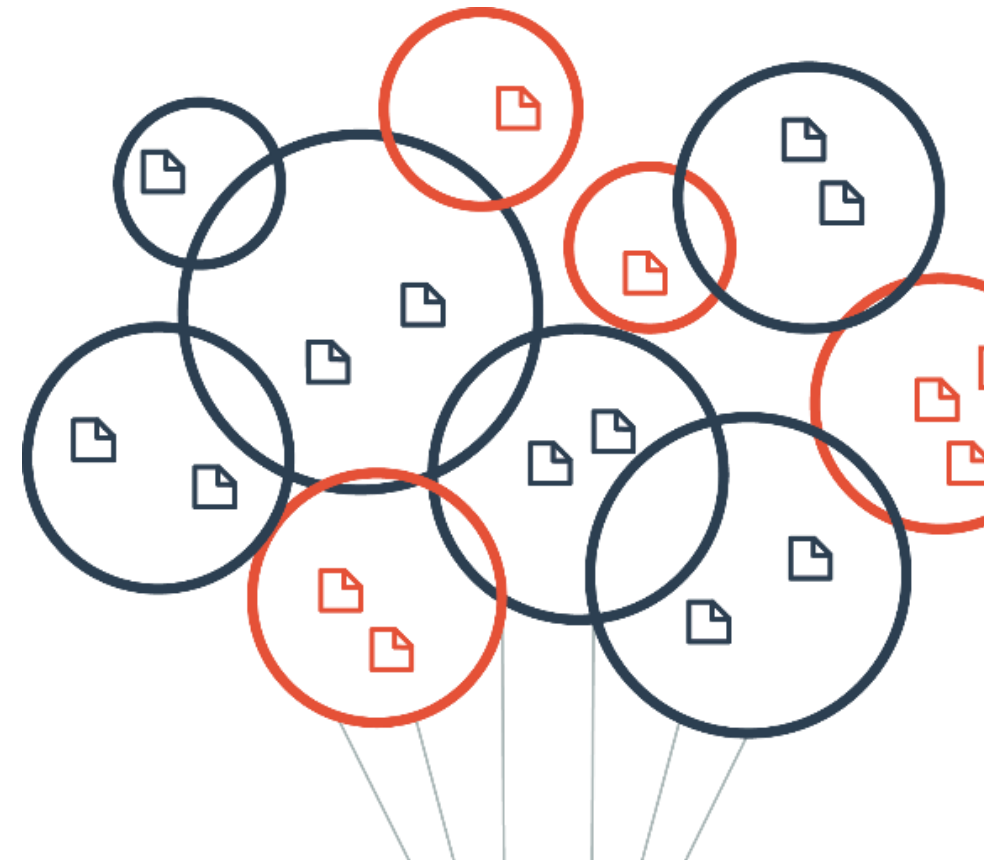


Open Knowledge Maps

A non-profit organization

dedicated to **dramatically improving the visibility of scientific knowledge**

for **science and society alike**



Overview of heart diseases





beta

Map a research topic

Get an overview - Find papers - Identify relevant concepts

- PubMed** (biomedical research)
- BASE** (all disciplines)

[Refine your search](#) ▾

Enter your search term

GO

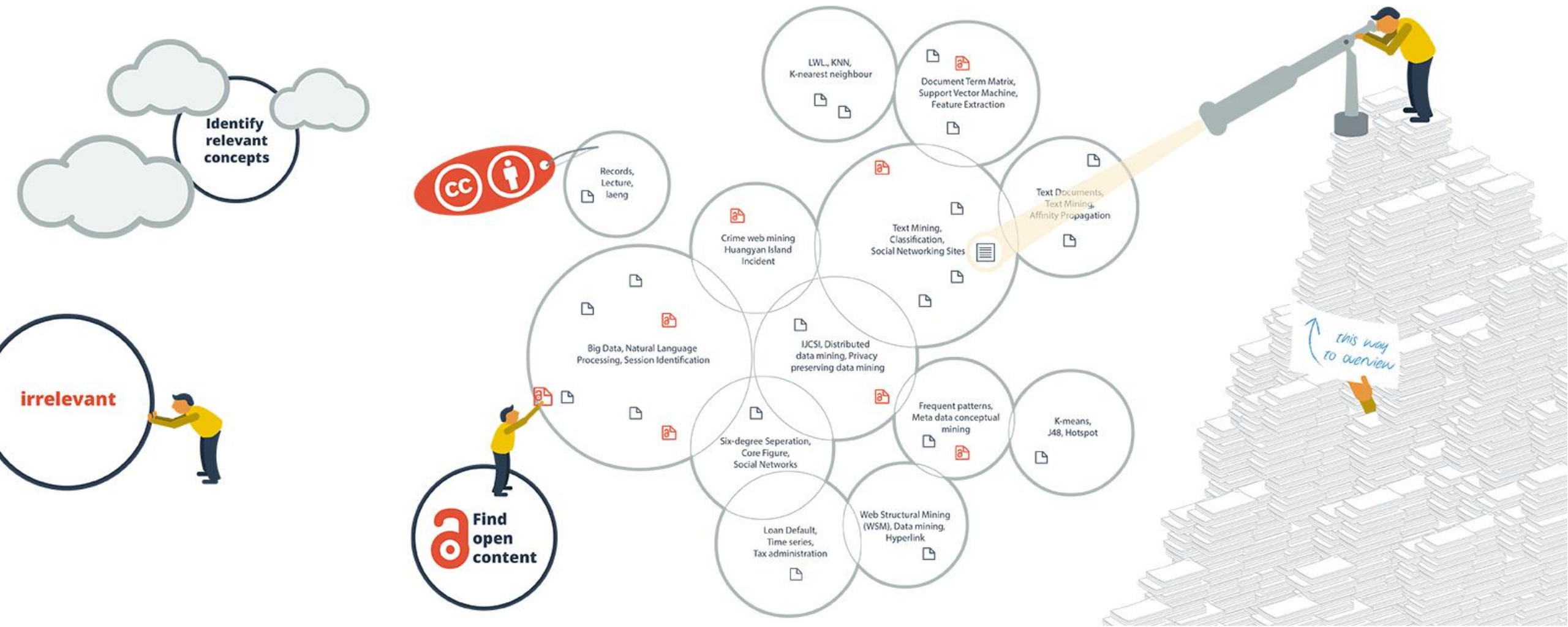
Try out: [sugar](#) [digital education](#)

[What is Open Knowledge Maps?](#)



<https://openknowledgemaps.org>

Advantages



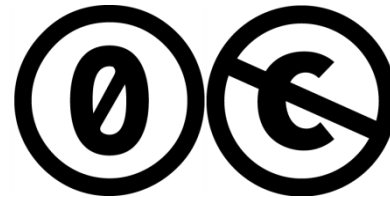
Open science, all the way

Open Source <https://github.com/OpenKnowledgeMaps>

Open Content



Open Data (planned)



Working in the open

Open roadmap

Open proposals

Participatory development

The first 18 months

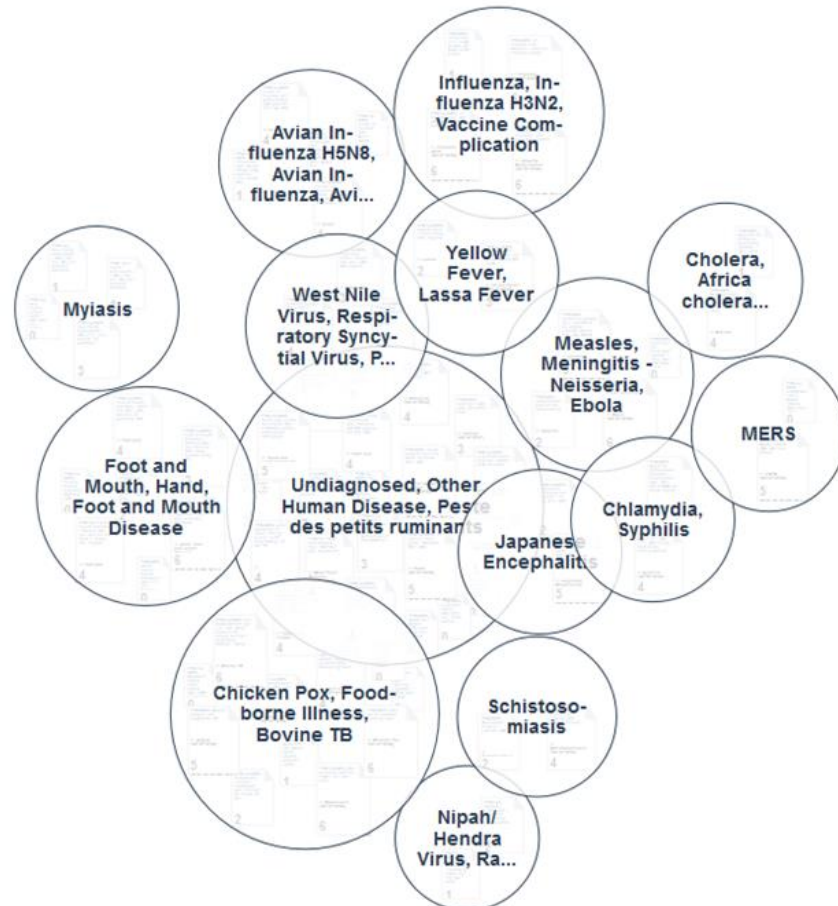
200,000+ visits on the site, 43,000+ maps created, 400+ participants in workshops



Project ProMED Mapper



Overview of the 100 most recent ProMED-mail reports



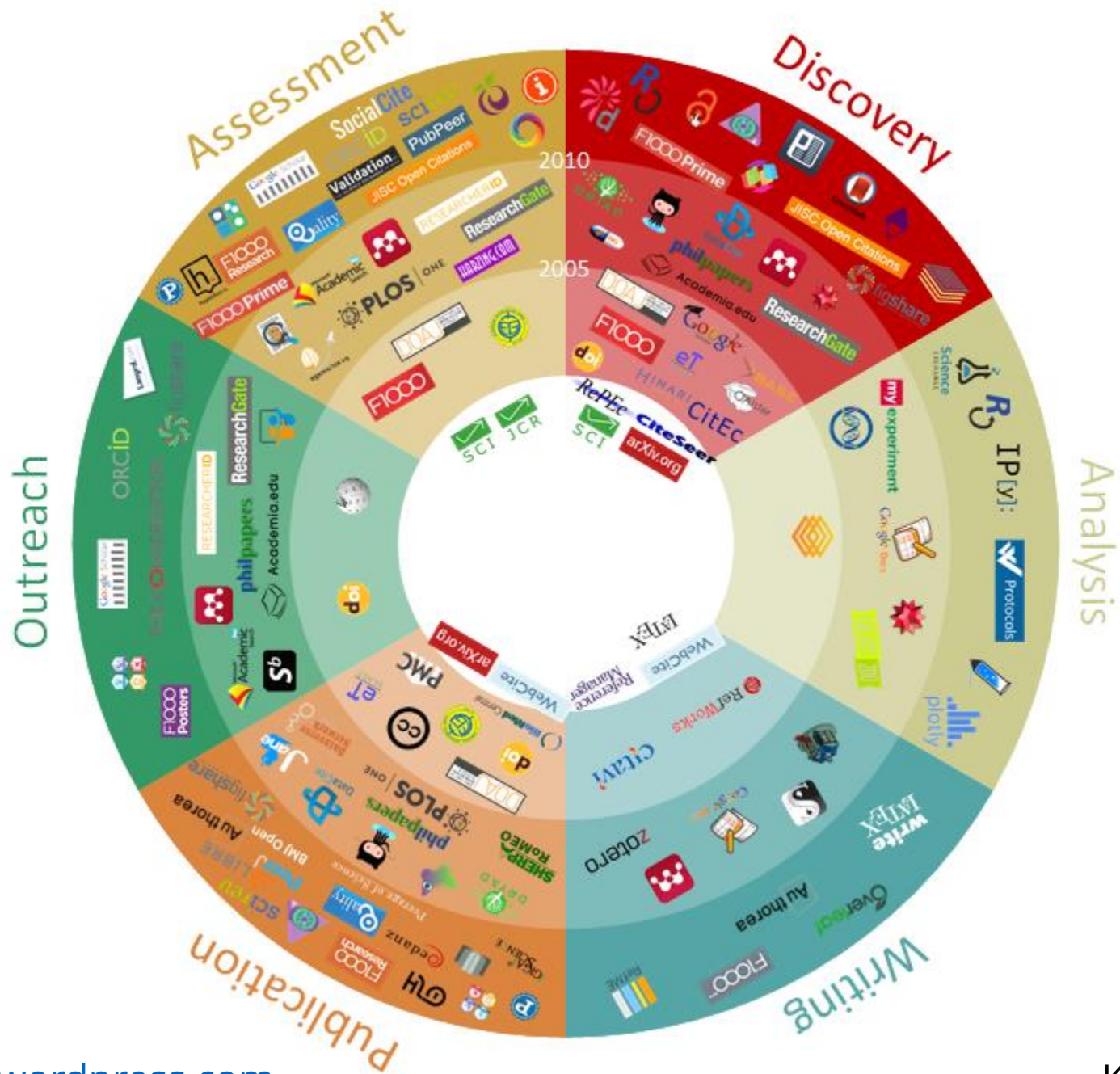
Hide list	
Search...	citations title authors year
PRO/EDR> Influenza (42): Sweden, vaccine efficacy study in <i>Influenza (2016-10-30)</i>	HTML ↗
INFLUENZA (42): SWEDEN, VACCINE EFFICACY STUDY ***** A ProMED-mail post ProMED-mail is a program of the International Society for Infectious Diseases Date: Mon 12 Sep 2016 [published] Source: Eurosurveillance ...	
Area: Influenza, Influenza H3N2, Vaccine Complication	6 recency
PRO/AH/EDR> Influenza (43): USA (OH) H3N2 variant outbreak in <i>Influenza H3N2 (2016-10-30)</i>	HTML ↗
INFLUENZA (43): USA (OHIO) H3N2 VARIANT OUTBREAK ***** A ProMED-mail post ProMED-mail is a program of the International Society for Infectious Diseases Date: 28 Oct 2016 Source: MMWR [edited] On 3 Aug 2016, ...	
Area: Influenza, Influenza H3N2, Vaccine Complication	6 recency
PRO/EDR> Hand, foot & mouth disease (02): USA (Northern Mariana Islands), Grenada in <i>Hand, Foot and Mouth Disease (2016-10-30)</i>	HTML ↗
HAND, FOOT AND MOUTH DISEASE (02): USA (NORTHERN MARIANA ISLANDS), GRENADA ***** A ProMED-mail post ProMED-mail is a program of the International Society for Infectious Diseases in ...	
Area: Foot and Mouth, Hand, Foot and Mouth Disease	6 recency
PRO/EDR> Influenza (44): narcolepsy, vaccine associated in <i>Vaccine Complication (2016-10-30)</i>	HTML ↗
INFLUENZA (44): NARCOLEPSY, VACCINE ASSOCIATED ***** A ProMED-mail post ProMED-mail is a program of the International Society for Infectious Diseases Date: 28 Oct 2016 Source: MPR [edited] A multinational retr...	
Area: Influenza, Influenza H3N2, Vaccine Complication	6 recency
PRO/AH/EDR> Mycobacterium bovis - UK: (England) ex S. Africa, animal-to-person transm., 2013 in <i>Bovine TB (2016-10-30)</i>	HTML ↗
MYCOBACTERIUM BOVIS - UK: (ENGLAND) ex SOUTH AFRICA, AIRBORNE ANIMAL-TO-HUMAN TRANSMISSION, 2013	

<http://openknowledgemaps.org/imed2016>

Collaborative discovery

The image shows a screenshot of a collaborative workspace interface. At the top, there is a header bar with a search icon on the left and a user profile icon on the right. Below the header, there are two buttons labeled '+ area' and '+ resource'. In the center, a cluster of light blue circular icons represents various documents and resources. One icon in the center is highlighted in red and labeled 'new'. To the right of the cluster is a red-bordered button labeled 'Publish'. A dark blue chat bubble in the bottom right corner contains the text: 'Lauren: Check out zika presentation I added to our Zotero group'. At the bottom of the interface, there is a video player control bar with a play button, a progress bar, and a timestamp of 00:40.

<https://vimeo.com/188647919>





400+ Tools and innovations in scholarly communication

web based tools a researcher can use

authors Bianca Kramer & Jeroen Bosman (and you?)

contact @MsPhelps & @JeroenBosman, both at Utrecht University Library

url: https://docs.google.com/spreadsheets/d/1KUMSeq_Pzp4KveZ7pb5rddcssk1XBTLHniD0d3nDqo

friendly url: <http://bit.ly/innoscholcommHist>

related to poster: <http://dx.doi.org/10.6084/m9.figshare.1286826>

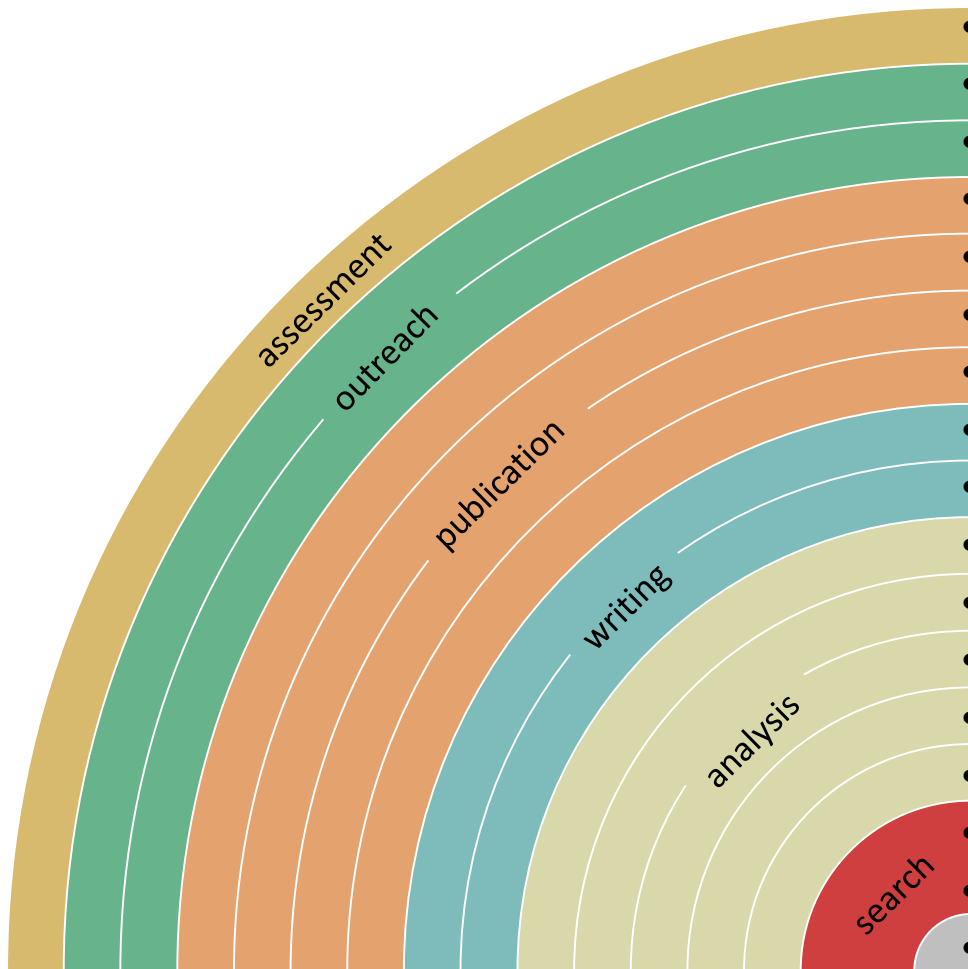
related to website: <https://innoscholcomm.silk.co/>

accompanying survey: <https://101innovations.wordpress.com/>

background: This is a shared database that grew out of the "101 innovations in scholarly communication" project. When we published the 101 list of selected innovations our database already contained some 200 innovations/tools. The 101 selection was strictly on innovativeness and thus did not contain recent tools if they were not innovative compared to older ones with the same functionality, even if the more recent ones were more popular or well-known. The database shared here has dropped that strict innovativeness criterion and thus contains multiple tools offering basically the same functionality. The masterfile that this database is derived from is still being worked on. Additional fields may become available here in a later stage.

<http://bit.ly/innoscholcomm-list>

You can make your workflow more open by...



- adding alternative evaluation, e.g. with altmetrics
- communicating through social media, e.g. Twitter
- sharing posters & presentations, e.g. at FigShare
- using open licenses, e.g. CC0 or CC-BY
- publishing open access, 'green' or 'gold'
- using open peer review e.g. at Peerage of Science
- sharing preprints, e.g. at arXiv, bioRxiv or OSF
- using actionable formats, e.g. with Jupyter
- open XML-drafting e.g. at Overleaf or Authorea
- sharing protocols & workfl. e.g. at MyExperiment
- sharing notebooks e.g. at OpenNotebookScience
- sharing code e.g. at GitHub with GNU license
- sharing data, e.g. at Zenodo, Dryad, Dataverse
- pre-registering, e.g. at OSF or AsPredicted
- commenting openly, e.g. with Hypothes.is
- using shared reference libraries, e.g. with Zotero
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OPEN SCIENCE WORKSHOP: WHAT'S IN IT FOR ME? POSTMORTEM REPORT

Authorea preprint 10/19/2017 DOI: [10.22541/au.150841698.80990617](https://doi.org/10.22541/au.150841698.80990617)

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-  **Peter Kraker** (Open Knowledge Maps)
-  **Bianca Kramer** (Utrecht University)
-  **Patrick Lehner** (Open Innovation in Science Center, Ludwig Boltzmann Gesellschaft)
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-  **Manon Oschounig** (Open Innovation in Science Center, Ludwig Boltzmann Gesellschaft)

Abstract

This postmortem report will provide all readers with important information about the Open Science workshop which took place in Vienna, Austria on the 20th of September 2017. The workshop was organised by the [Open Innovation in Science Research and Competence Center](#), [Open Access Austria](#), [Austrian Transition to Open Access](#) and [Open Knowledge Austria](#). All authors of this document participated at this Open Science workshop and contributed to the report in a collaborative writing effort. In this report, readers will find an overview about the Open Science Workshop structure, presented content of the workshop, all slides pictures, social media interactions and everything we have learned from organising this highly important workshop on Open Science.

<https://is.gd/osworkshop17>

Getting involved



<http://oana.at>



<http://okfn.at/open-science>

Thank you for your attention!

Dr. Peter Kraker
(Open Knowledge
Maps)

Medical University
of Innsbruck,
4 December 2017



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