Royal College of Surgeons in Ireland

Coláiste Ríoga na Máinleá in Éirinn

RCSI

Practical tips for open science, open access and open data

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RCSI 6th June 2019

HRB Health Research Board

HRB Centre for Primary Care Research

Queen's University Belfast

NUI Galway Ollscoil na Gaillimh

Trinity College Dublin

Outline

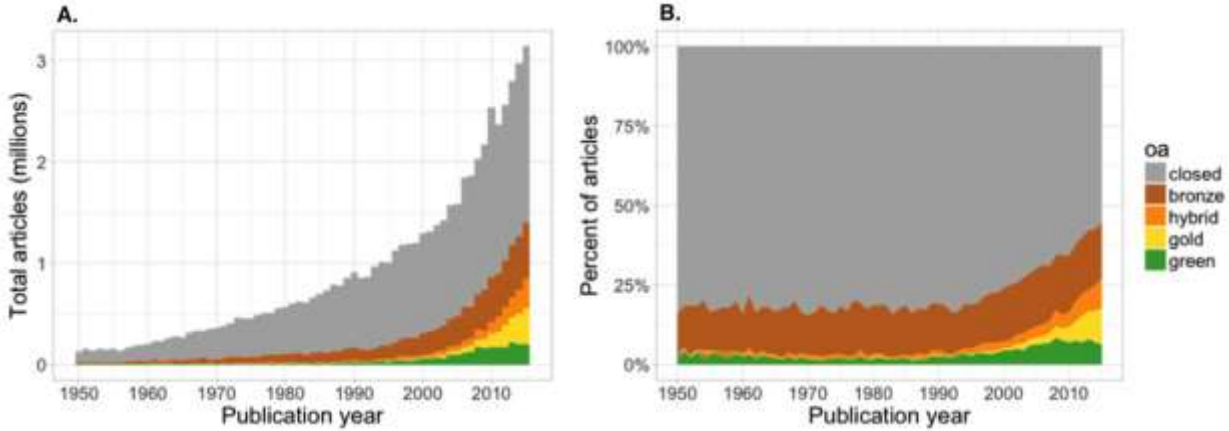
- What is open science
- Open access
  - Why?
  - How?
- Open data
  - Considerations

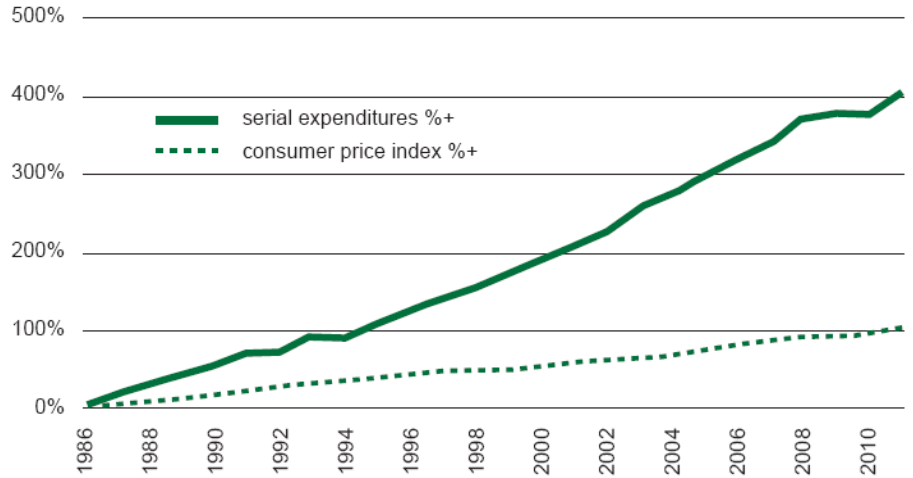
Acknowledgements

Dr Rachael Ainsworth
@rachaelevelyn

Challenges in research

- Access crisis
- Reproducibility crisis
- Serials crisis
- Evaluation crisis





What is open science?

Melanie Imming, & Jon Tennant. (2018, June 8). Sticker open science: just science done right. Zenodo. http://doi.org/10.5281/zenodo.128557

What is Open Science?

Open Science is the practice of science in such a way that others can collaborate and contribute, where research data, lab notes and other research processes are freely available, under terms that enable reuse, redistribution and reproduction of the research and its underlying data and methods.

[FOSTER, Open Science Definition: https://www.fosteropenscience.eu/foster-taxonomy/open-science-definition]

… but isn't this just science?

https://zenodo.org/record/1464853

Barriers to Open Science

https://doi.org/10.6084/m9.figshare.5558653

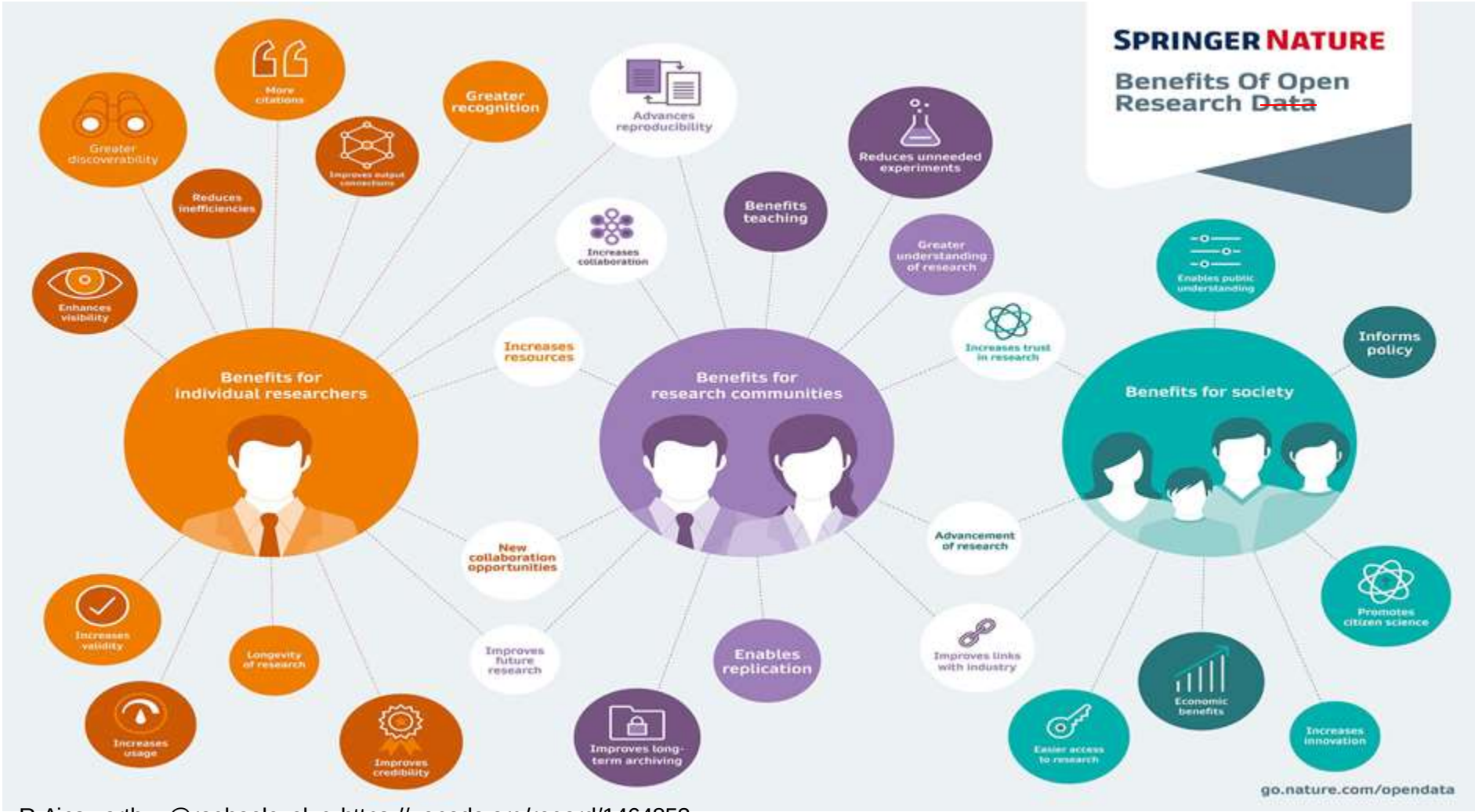
Fear of

- Scooping or ideas being stolen
- Not being credited for ideas
- Errors and public humiliation
- Risk to reputation
- Reduced scientific quality
- Information overload

Barriers to Open Science

John R. McKiernan http://whyopenresearch.org

- Lack of awareness and training
- Cultural inertia and misinformation
- Challenging the establishment
- Follow the status quo to succeed
- Perceived lack of reward
- Not considered for promotion
- Requires additional skills
- Takes time
- Publication bias towards novel findings



R Ainsworth – @rachaelevelyn https://zenodo.org/record/1464853

Declaration On Research Assessment

Improving how research is assessed

sfdora.org

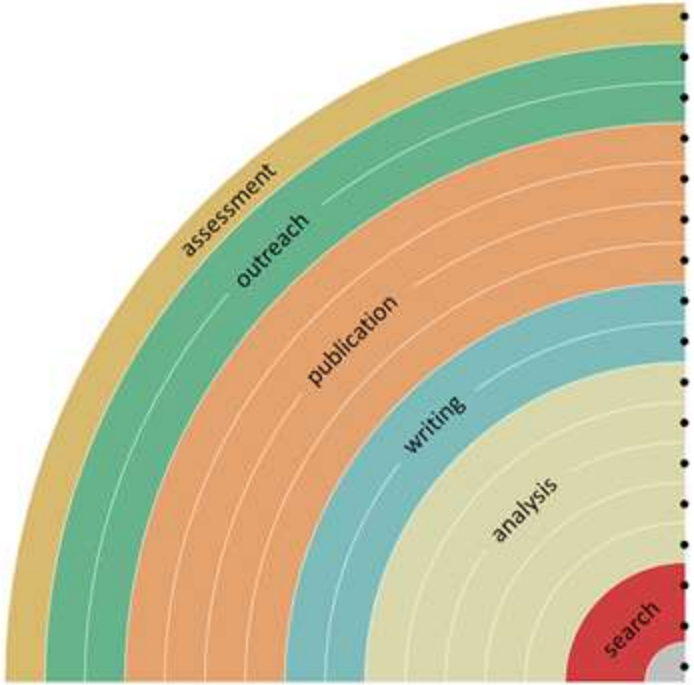
@DORAssessment

Signed by >500 organizations and >12,500 individuals

Supporting organizations

ascb · CANCER RESEARCH UK · eLIFE · EMBO excellence in life sciences · FIOCCOResearch Open for Science · Hindawi · PLOS · The Company of Biologists · wellcome

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 journals or PubPeer
- sharing preprints, e.g. at OSF, arXiv or bioRxiv
- using actionable formats, e.g. with Jupyter or CoCalc
- open XML-drafting, e.g. at Overleaf or Authorea
- sharing protocols & workfl., e.g. at Protocols.io
- sharing notebooks, e.g. at OpenNotebookScience
- sharing code, e.g. at GitHub with GNU/MIT license
- sharing data, e.g. at Dryad, Zenodo or Dataverse
- pre-registering, e.g. at OSF or AsPredicted
- commenting openly, e.g. with Hypothes.is
- using shared reference libraries, e.g. with Zotero
- sharing (grant) proposals, e.g. at RIO

DOI: 10.5281/zenodo.1147025

Open access

Open access

- Sir Osler - first formal journal club in Montreal

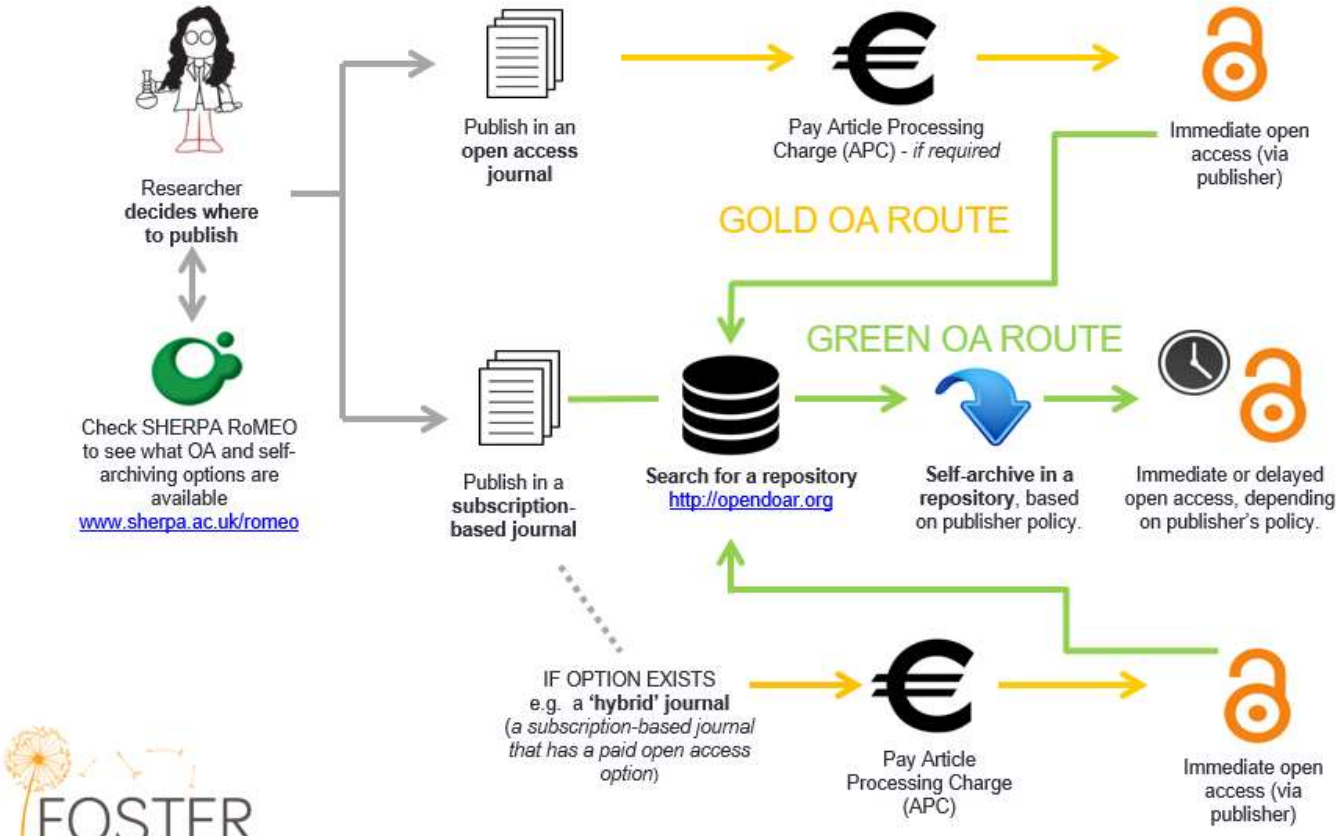
  "for the purchase and distribution of periodicals which he could ill afford to subscribe as an individual"

- Only results that can be discussed, challenged, tested and reproduced by others qualify as scientific.

- Science, an institution of organised criticism

- New research builds on results from previous research.

Routes to open access publication



FOSTER

Plan S/cOAlition S

Supported by major funders, eg Wellcome, EU commission

By 2020, research funded by public grants must be published in open access journals or platforms.

- Publication fees should be standardized and capped, covered by funders or universities;
- Hybrid open-access journals are not compliant;
- Funders commit to value intrinsic merit of research outputs in making funding decisions, not the publication channel, IF, or publisher.

Pre-print servers

Instit

bioRxiv

preprints

medRxiv

THE PREPRINT SERVER FOR HEALTH SCIENCES

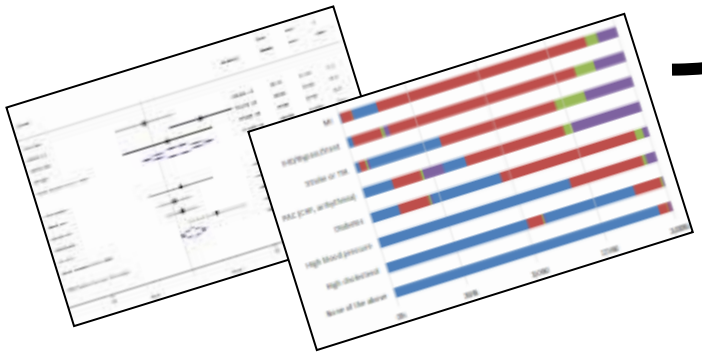
Wellcome Open Research

HRB Open Research

How?

Manuscript_for_submission.doc

Final_manuscript_reviewed.doc



Open data


MISSION
APPLY
PRIZE & SUPPORTERS
AWARD RECIPIENTS
COI RULES
THE PARASITE AWARDS
Celebrating rigorous secondary data analysis
Tweet

Data sharing policies

BMJ: data sharing statement for all research papers.

- For reports of clinical trials: relevant anonymised patient level data available on reasonable request.

PLOS One: all data fully available without restriction at the time of publication.

- If public sharing legally/ethically impossible, indicate how data may be accessed (not solely contact the author).

EU Commission: a flexible pilot which has been extended.

Benefits of open data

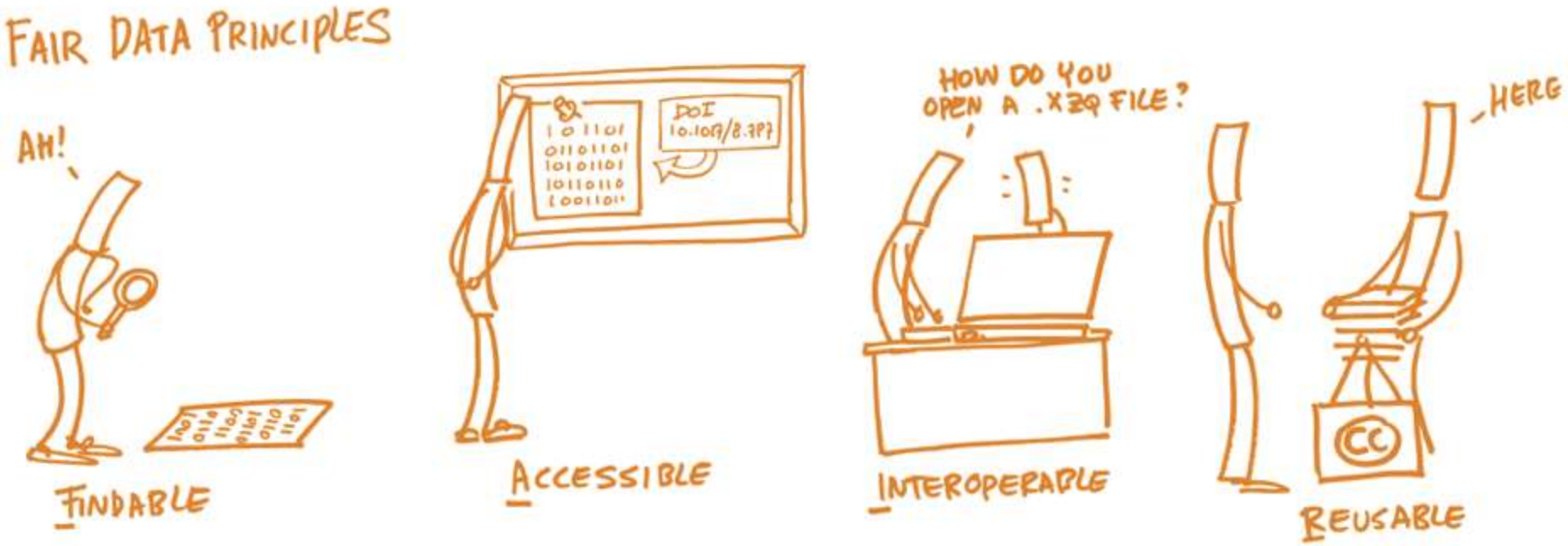
- Allowing greater access to data to build upon and create new research from publicly accessible data.
- Enhancing the visibility of one's research.
- Allows analysis to be reproduced and verified.
- Increasing researcher transparency and reducing academic fraud.
- Ensuring compliance with funding agency mandates and journal publishing policies.

Your primary collaborator is yourself 6 months from now, and your past self doesn't answer emails.

https://dynamicecology.wordpress.com/2015/02/18/the-biggest-benefit-of-my-shift-to-r-reproducibility/

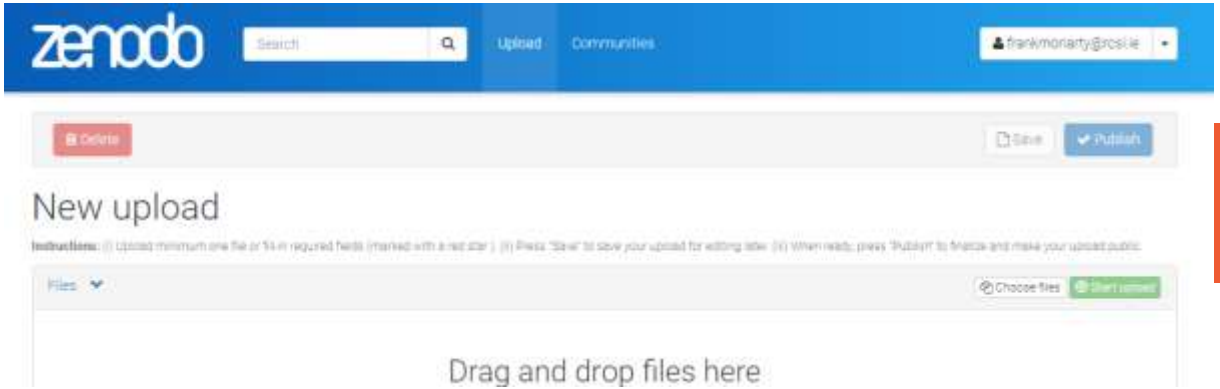
R Ainsworth – @rachaelevelyn

FAIR principles



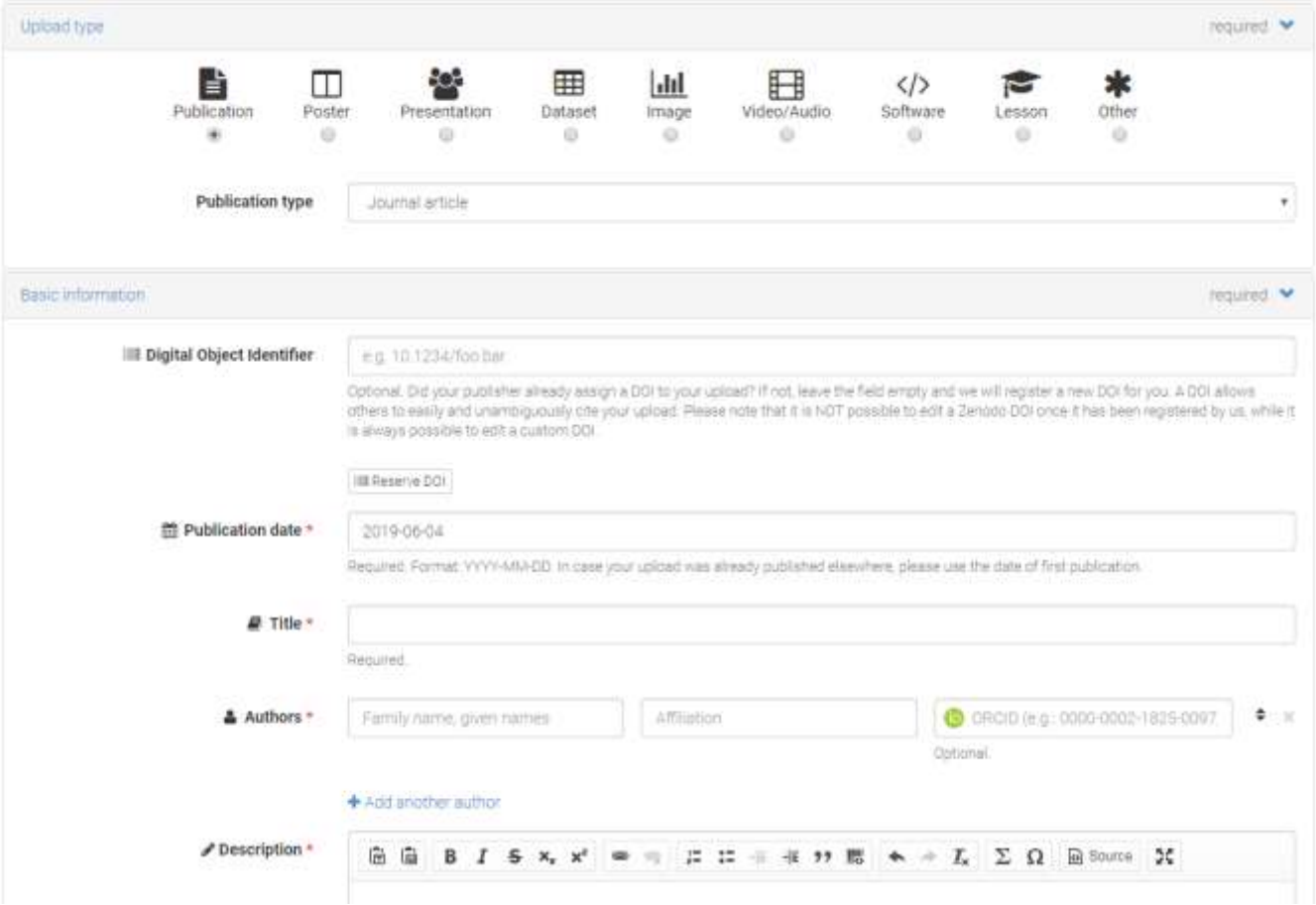
Where?

How?



creative commons

How?


Upload type
required
Publication
Poster
Presentation
Dataset
Image
Video/Audio
Software
Lesson
Other
Publication type
Journal article
Basic information
required
Digital Object Identifier
e.g. 10.1234/foo.bar
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Add another author
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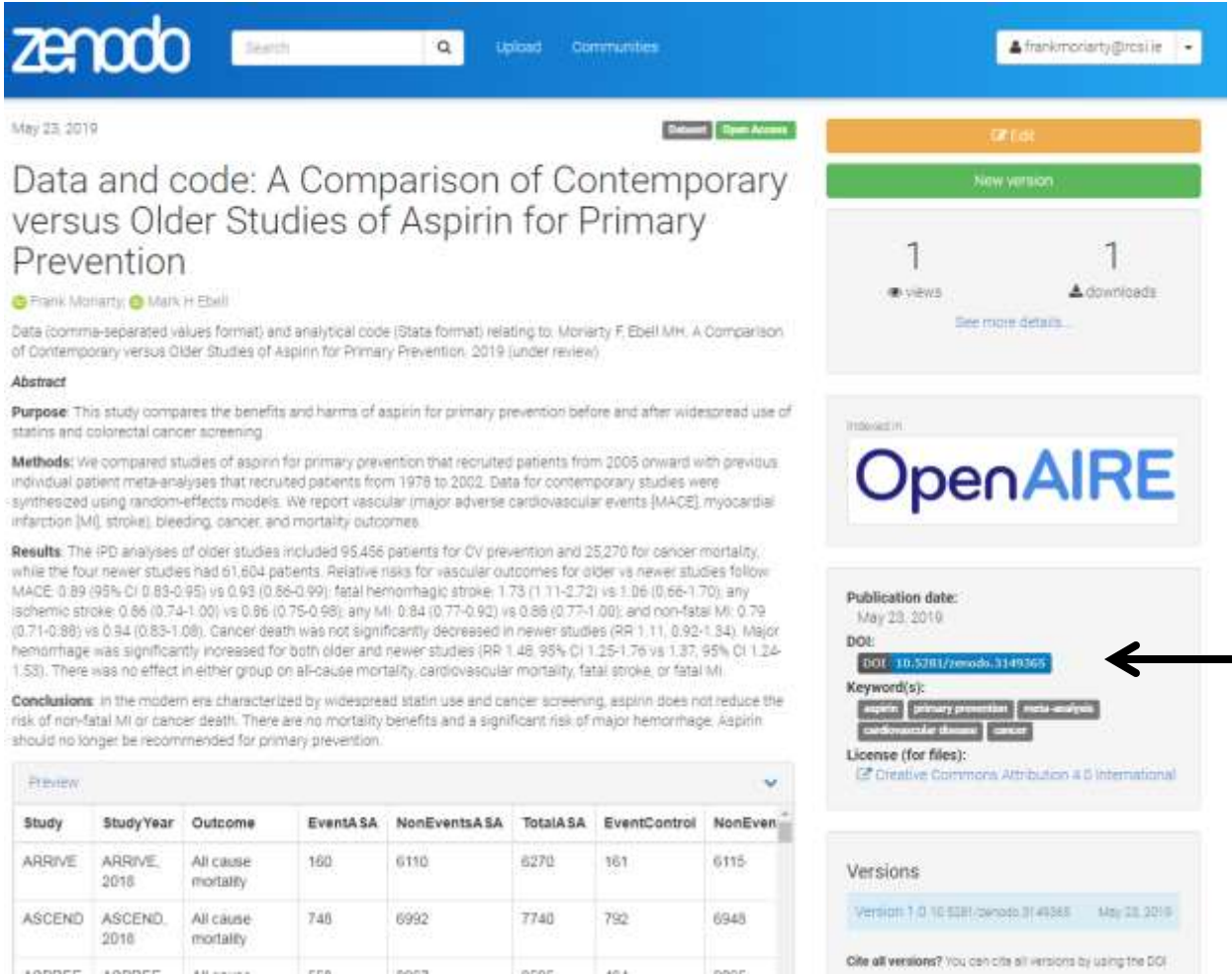
How?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Upload
Communities
frankmoriarty@rcsi.ie
May 23, 2019
Dataset
Open Access
Edit
New version
Data and code: A Comparison of Contemporary versus Older Studies of Aspirin for Primary Prevention
Frank Moriarty
Mark H Ebell
Data (comma-separated values format) and analytical code (Stata format) relating to: Moriarty F, Ebell MH. A Comparison of Contemporary versus Older Studies of Aspirin for Primary Prevention. 2019 (under review)
Abstract
Purpose: This study compares the benefits and harms of aspirin for primary prevention before and after widespread use of statins and colorectal cancer screening.
Methods: We compared studies of aspirin for primary prevention that recruited patients from 2005 onward with previous individual patient meta-analyses that recruited patients from 1978 to 2002. Data for contemporary studies were synthesized using random-effects models. We report vascular (major adverse cardiovascular events [MACE], myocardial infarction [MI], stroke), bleeding, cancer, and mortality outcomes.
Results: The IPD analyses of older studies included 95,456 patients for CV prevention and 25,270 for cancer mortality, while the four newer studies had 61,604 patients. Relative risks for vascular outcomes for older vs newer studies follow: MACE: 0.89 (95% CI 0.83-0.95) vs 0.93 (0.86-0.99); fatal hemorrhagic stroke: 1.73 (1.11-2.72) vs 1.06 (0.66-1.70); any ischemic stroke: 0.86 (0.74-1.00) vs 0.86 (0.75-0.98); any MI: 0.84 (0.77-0.92) vs 0.88 (0.77-1.00); and non-fatal MI: 0.79 (0.71-0.88) vs 0.94 (0.83-1.08). Cancer death was not significantly decreased in newer studies (RR 1.11, 0.92-1.34). Major hemorrhage was significantly increased for both older and newer studies (RR 1.48, 95% CI 1.25-1.76 vs 1.37, 95% CI 1.24-1.53). There was no effect in either group on all-cause mortality, cardiovascular mortality, fatal stroke, or fatal MI.
Conclusions: In the modern era characterized by widespread statin use and cancer screening, aspirin does not reduce the risk of non-fatal MI or cancer death. There are no mortality benefits and a significant risk of major hemorrhage. Aspirin should no longer be recommended for primary prevention.
Preview
Study
StudyYear
Outcome
EventASA
NonEventsASA
TotalASA
EventControl
NonEven
ARRIVE
ARRIVE, 2018
All cause mortality
160
6110
6270
161
6115
ASCEND
ASCEND, 2018
All cause mortality
748
6992
7740
792
6948
1
views
1
downloads
See more details...
Indexed in
OpenAIRE
Publication date:
May 23, 2019
DOI:
DOI 10.5281/zenodo.3149365
Keyword(s):
aspirin
primary prevention
meta-analysis
cardiovascular disease
cancer
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Creative Commons Attribution 4.0 International
Versions
Version 1 (10.5281/zenodo.3149365) May 23, 2019
Cite all versions? You can cite all versions by using the DOI

Summary

- Open access now compulsory in many cases
- Open data also gaining prominence
- Both relatively easy to achieve

> “ Future generations will look on the term "open science" as a tautology - a throwback from an era before science woke up. **Open science will simply become known as science**, and the closed, secretive practices that define our current culture will seem as primitive to them as alchemy is to us.
>
> - Brian Nosek & Chris Chambers (Psychology)

Acknowledgements

- Dr Rachael Ainsworth @rachaelevelyn

- For more information: