On the importance of open science and researcher assessment reform in fostering research integrity

Lex Bouter

2023-02-10 On the importance of open science and researcher assessment reform in fostering research integrity – 60 minutes plus 30 minutes Q&A – Stellenbosch University

Content

- Introduction to the topic
- Replication crisis and the need for Open Science
- Research Integrity
- What can research institutions do to improve research culture and remove perverse incentives

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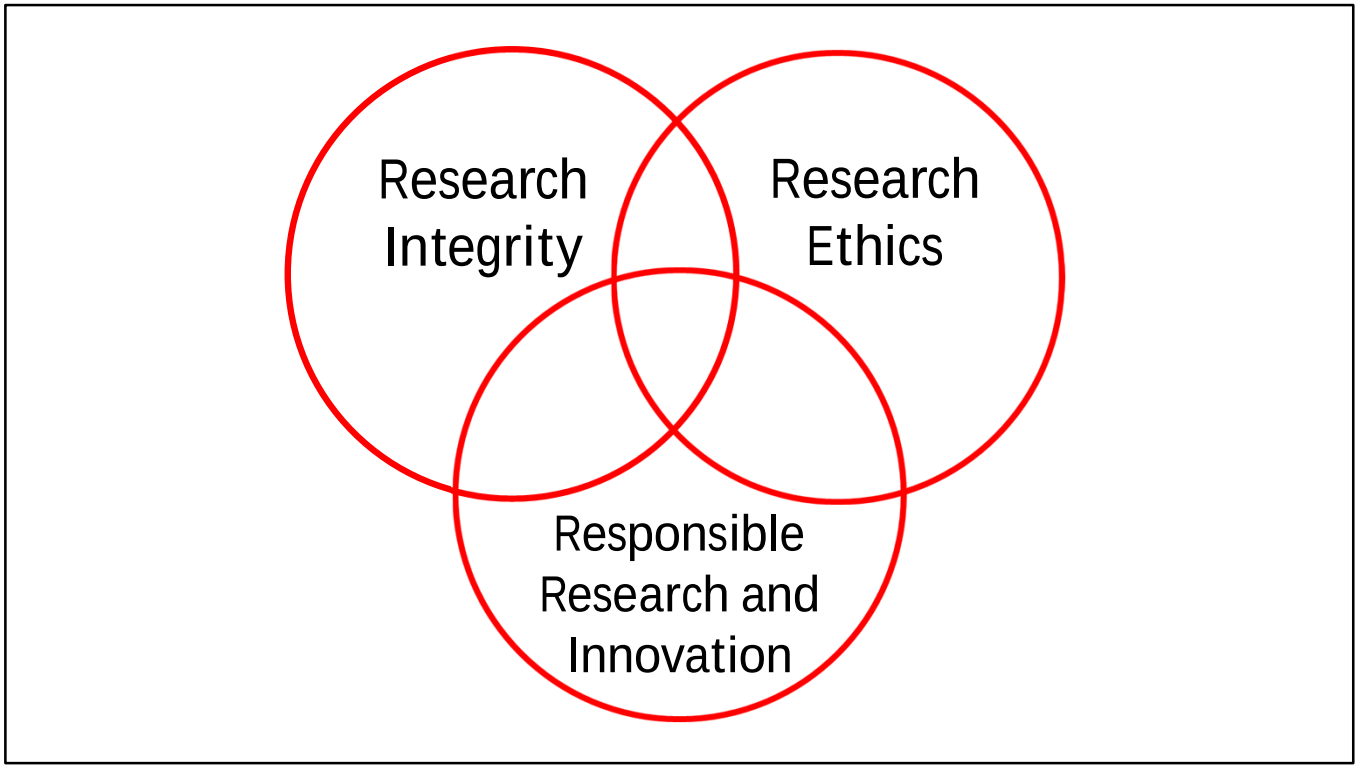
Research Integrity concerns behavior of researchers that promotes or hampers the validity (truth) of research findings or the trust in research findings and in researchers

- Trust needs to be deserved by being trustworthy
- Transparency strenghtens trustworthiness
- Open Science practices enable accountability and traceability

Let me be clear: the fact that RI is about individual behavior doesn't mean that only the individual is responsible. Also the local research culture and the incentives of the system of science are strong drivers of RI.

Bouter L, Kleinert S, Horn L. Research integrity and societal trust in research. South African Heart Journal 2021; 18: 80-1.
https://www.journals.ac.za/index.php/SAHJ/article/view/4879

https://www.wcrif.org/foundation/mission



Research Ethics (RE) concerns the ethical considerations of research with humans and animals.

Responsible Research &

Innovation (RRI) concerns the benefits and harms of research for society and the environment.

How to trust a scientist

Jeroen de Ridder

Replication and trustworthiness

Rik Peels[a] and Lex Bouter[b]

de Ridder J. How to trust a scientist. Studies in the History and Philosophy of Science 2022; 93: 11-20. https://doi.org/10.1016/j.shpsa.2022.02.003

Peels R, Bouter L. Replication and trustworthiness. Accountability in Research 2021. https://doi.org/10.1080/08989621.2021.1963708

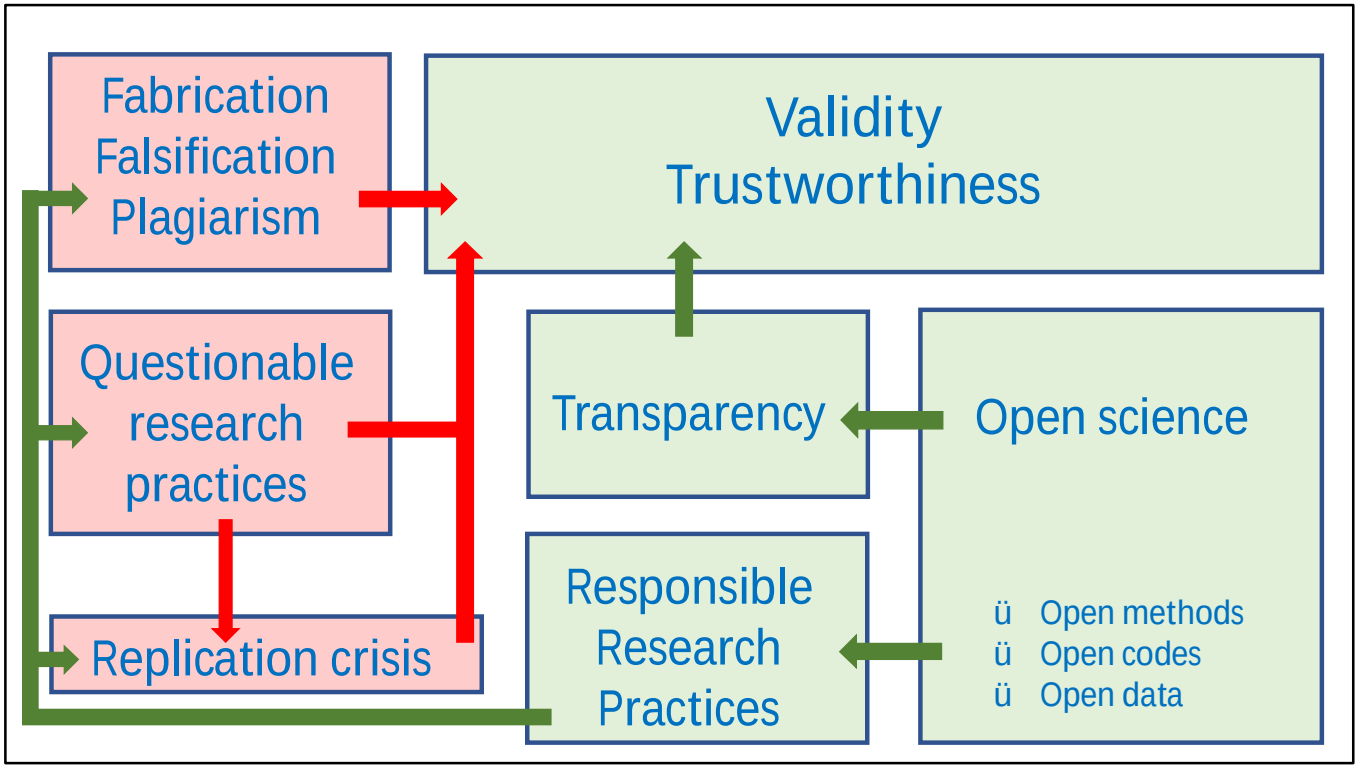
Researchers can be trusted if their claims are backed up by evidence gathered in accordance with methodological standards

Trustworthiness of research findings depends on:

- the prior probability of the findings
- study size and the methodological quality
- number of replications that were performed
- consistency of the findings
- what is at stake

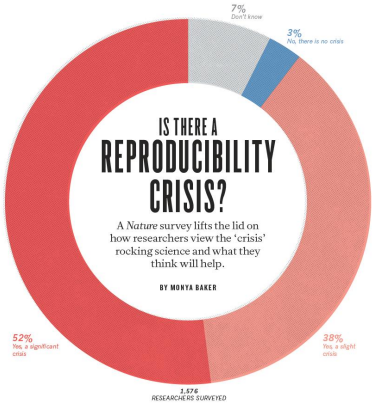
de Ridder J. How to trust a scientist. Studies in the History and Philosophy of Science 2022; 93: 11-20. https://doi.org/10.1016/j.shpsa.2022.02.003

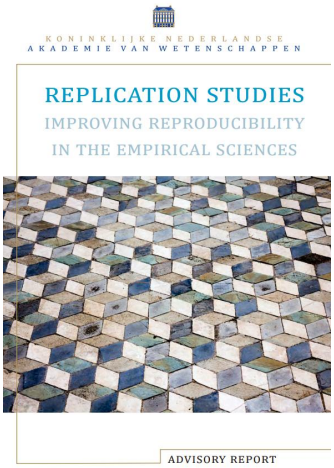
Peels R, Bouter L. Replication and trustworthiness. Accountability in Research 2021. https://doi.org/10.1080/08989621.2021.1963708

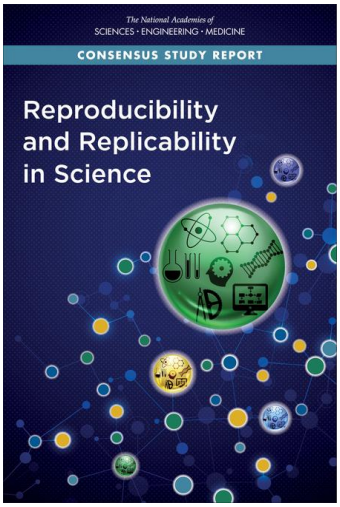


Haven T, Gopalakrishna G, Tijdink J, van der Schot D, Bouter L. Promoting trust in research and researchers: how open science and research integrity are intertwined. BMC Research Notes 2022; 15: 302. https://doi.org/10.1186/s13104-022-06169-y

Replicability of studies is only 10-40 %







8

Fighting the crisis is important but making research replicable and actually doing replication studies might even be more important.

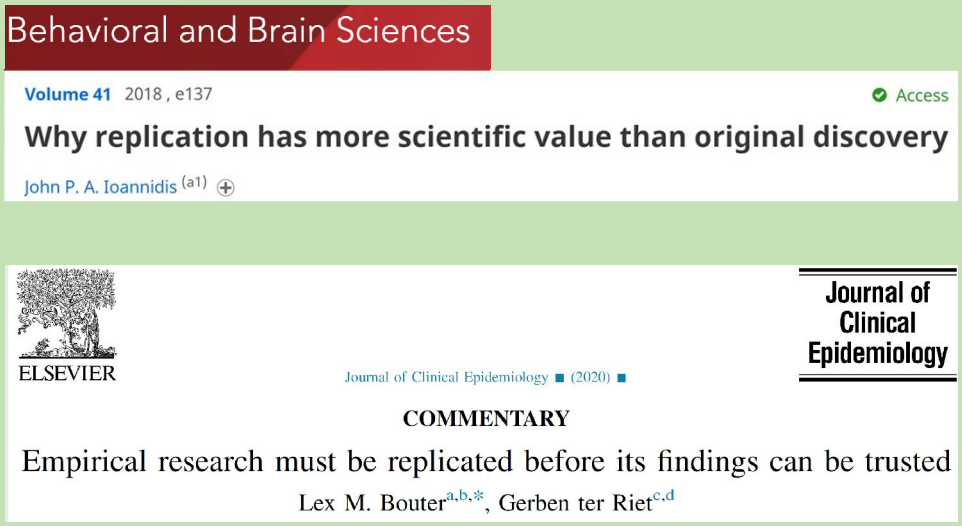
Cobey, KD, Fehlmann CA, Franco MC, Ayala AP, Sikora L, Rice DB, et al. 2022. "Epidemiological Characteristics and Prevalence Rates of Research Reproducibility Across Disciplines: A Scoping Review. OSF Preprints. March 9, 2022. https://osf.io/k6nf4

Baker - Is there a replicability crisis - Nature 2016; 533 452-4

The KNAW report *Replication studies* appeared in January 2018
PDF available at: https://www.nrin.nl/wp-content/uploads/KNAW-Replication-Studies-15-01-2018.pdf

The NAS report *Reproducibility and replicability* in Science appeared in June 2019
PDF available at: https://www.nap.edu/catalog/25303/reproducibility-and-replicability-in-science

Replication studies are often undervalued

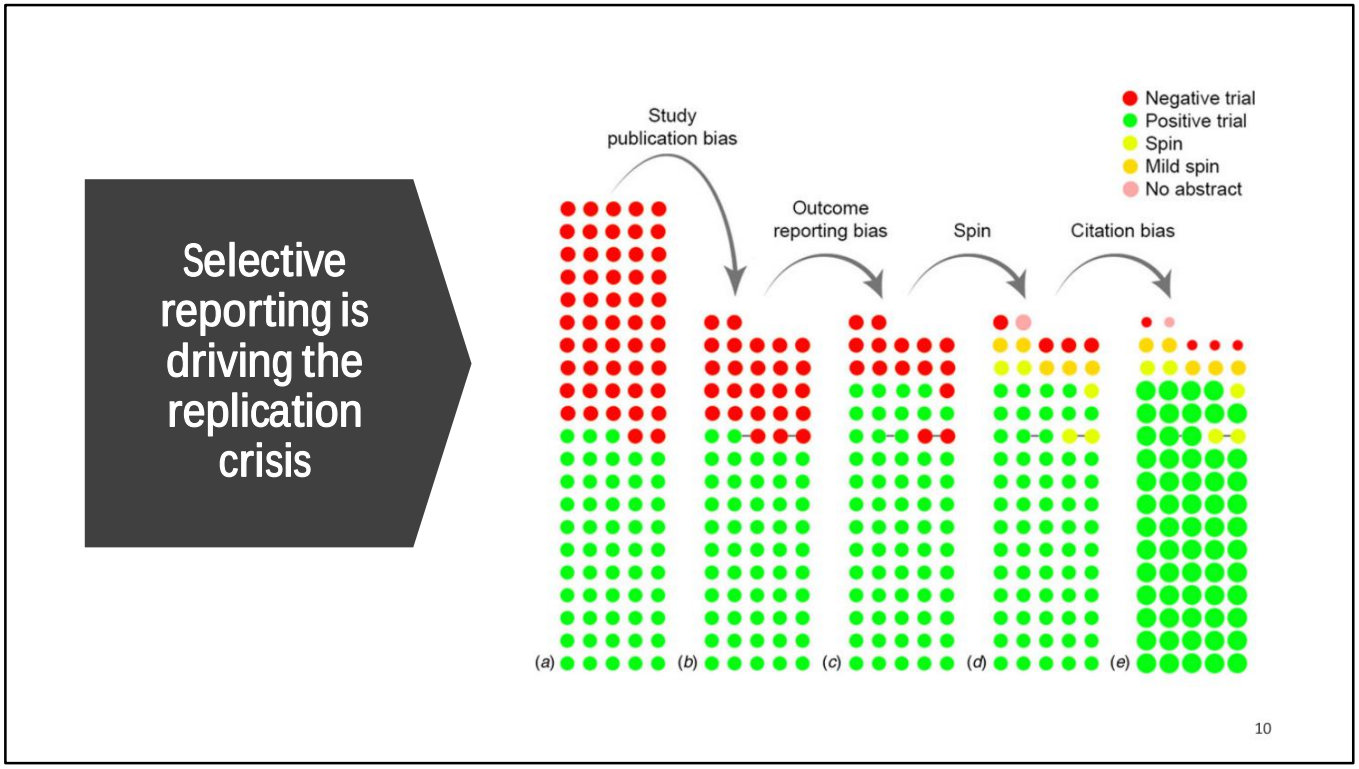


9

Fighting the crisis is important but making research replicable and actually doing replication studies might even be more important.

Ioannidis JPA. Why replication has more scientific value than original discovery. Behavioral and Brain Sciences 2018; 41: e137

Bouter LM, ter Riet G. Empirical research must be replicated before its findings can be trusted. Journal of Clinical Epidemiology 2021; 129: 188-90. https://www.jclinepi.com/article/S0895-4356(20)31118-5/fulltext



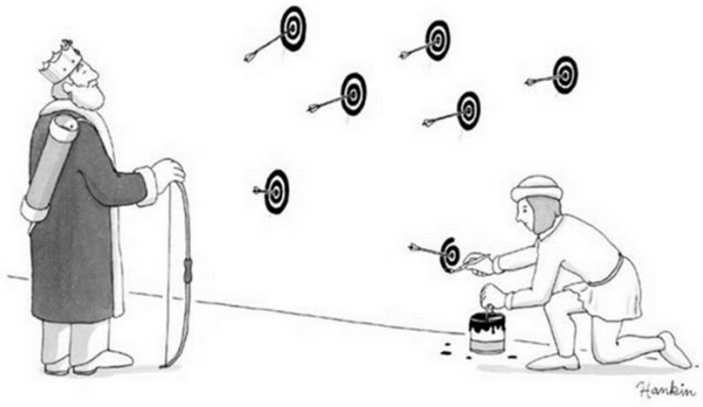
de Vries YA, Roest AM, de Jonge P, Cuijpers P, Munafò MR, Bastiaansen JA (2018). The cumulative effect of reporting and citation biases on the apparent efficacy of treatments: the case of depression. Psychological Medicine 1–3. https://doi.org/10.1017/S0033291718001873

This example concerns an inception cohort of 105 RCTs of the efficacy of anti-depression drugs from the FDA database. The cohort is complete in the sense that pharmaceutical companies must register all trials they intend to use to obtain FDA approval before embarking on data collection. The FDA considered 50% of the trials to be positive after carefully looking at the results.

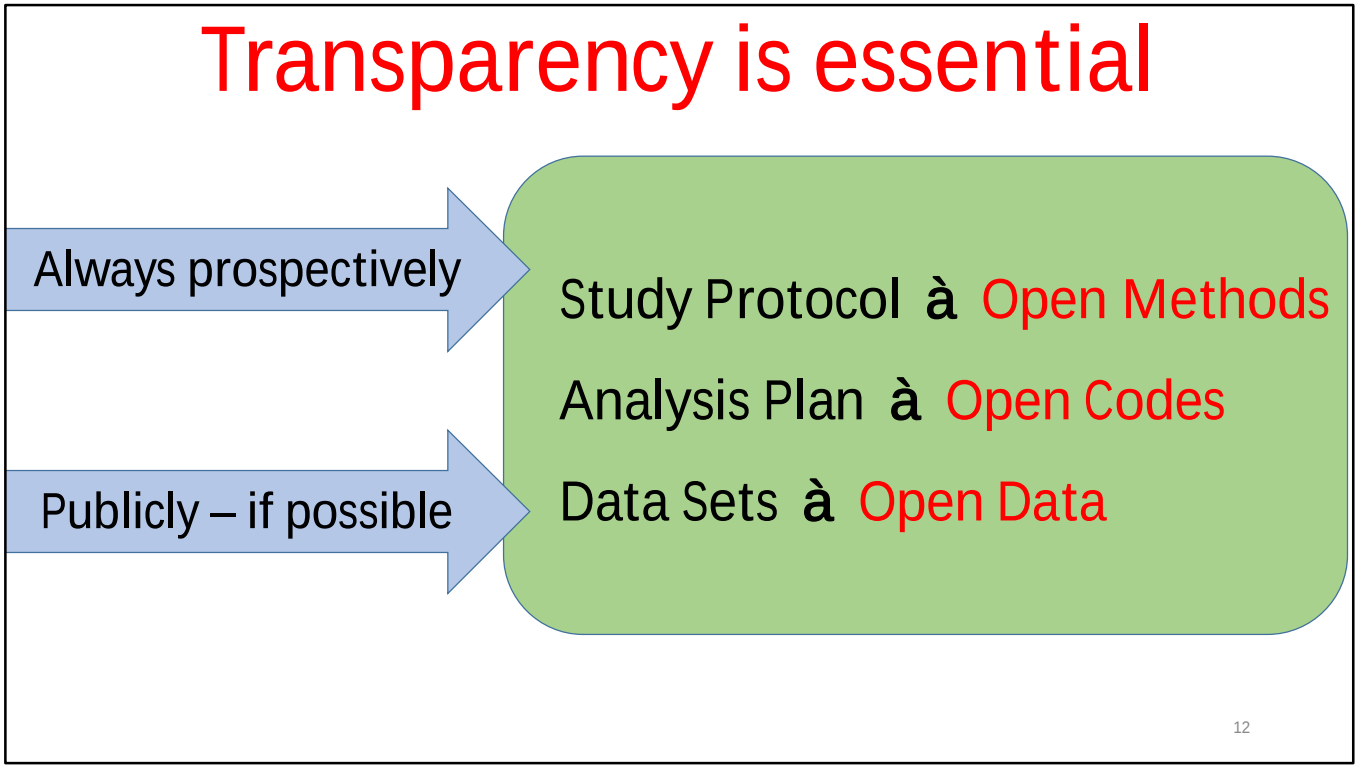
Drivers of the Replication Crisis

- Selective reporting
- Low power
- P-hacking
- HARKing

Hypothesizing After Results are Known



Wicherts et al - Degrees of freedom - checklist to avoid p-hacking - Front Psych 2016; 7: 1832. https://www.frontiersin.org/articles/10.3389/fpsyg.2016.01832/full



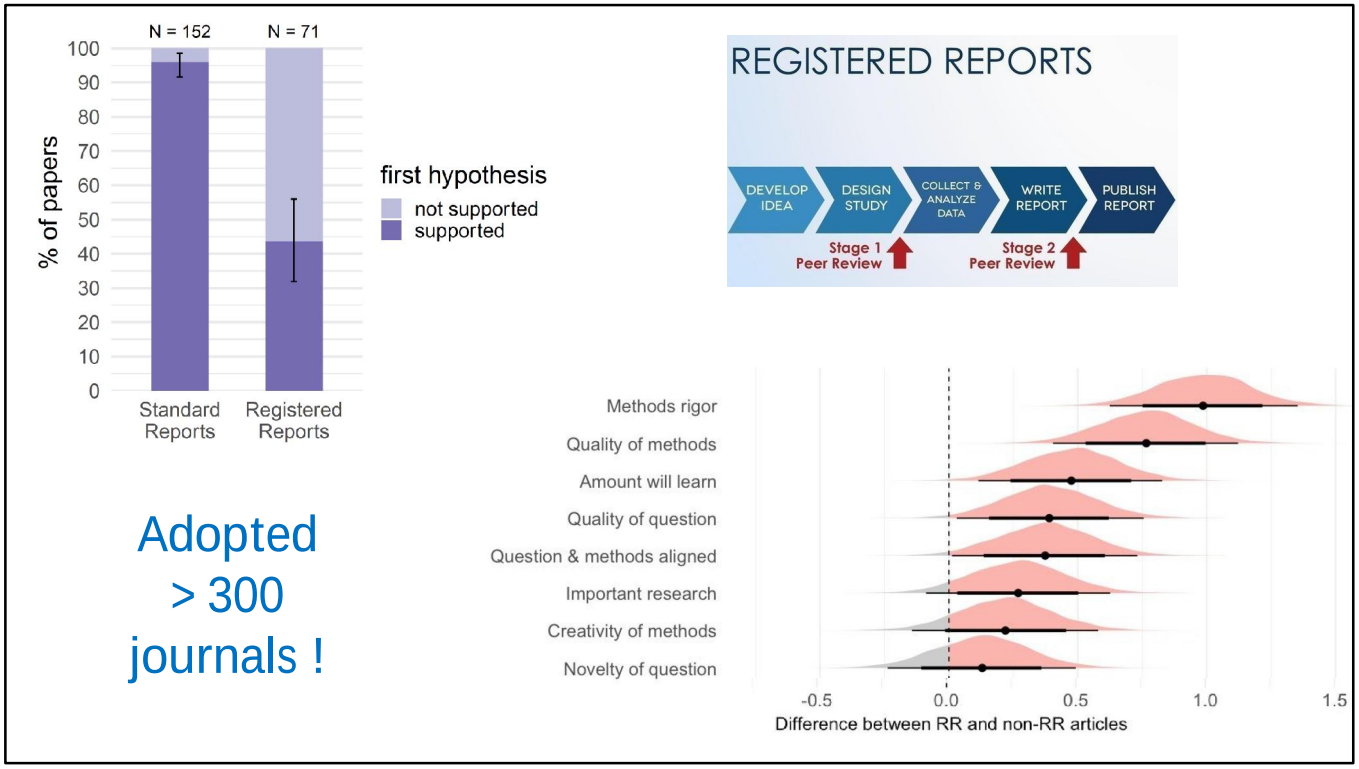
Nosek BA, Ebersole CR, DeHaven AC, Mellor D. The preregistration revolution. PNAS 2018;115:2600-6. http://www.pnas.org/content/115/11/2600

Bouter LM, ter Riet G. Empirical research must be replicated before its findings can be trusted. Journal of Clinical Epidemiology 2021; 129: 188-190. https://www.jclinepi.com/article/S0895-4356(20)31118-5/fulltext

Nosek BA, Ebersole CR, DeHaven AC, Mellor D. The preregistration revolution. PNAS 2018;115:2600-6. http://www.pnas.org/content/115/11/2600

Allen C, Mehler DMA. Open science challenges, benefits and tips in early career and beyond. PLoS Biol 2019; 17(5): e3000246. https://doi.org/10.1371/journal.pbio.3000246

https://www.cos.io/initiatives/prereg



Chambers C. What's next for registered reports. Nature 2019; 573 187-189. https://www.nature.com/articles/d41586-019-02674-6

Allen C, Mehler DMA. Open science challenges, benefits and tips in early career and beyond. PLoS Biol 2019; 17(5): e3000246. https://doi.org/10.1371/journal.pbio.3000246

Anne M. Scheel , Mitchell R. M. J. Schijen, and Daniël Lakens An excess of positive results: comparing the standard psychology literature with registered reports. Advances in Methods and Practices in Psychological Science April-June 2021, Vol. 4, No. 2, pp. 1–12. https://journals.sagepub.com/doi/full/10.1177/25152459211007467

Soderberg CK, Errington TE , Schiavone SR, Bottesini J, Thorn FS, Vazire S, Esterling KM, Nosek BA. Research Quality of Registered Reports Compared to the Standard Publishing Model. OSF preprint. https://osf.io/preprints/metaarxiv/7x9vy/

Henderson EL, Chambers CD (2022) Ten simple rules for writing a Registered Report. PLoS Comput Biol 18(10): e1010571. https://doi.org/10.1371/journal.pcbi.1010571

https://cos.io/rr/

Findable, Accessible, Interoperative, Reusable data reposition

Wilkinson MD, et al. The FAIR Guiding Principles for scientific data management and stewardship. Scientific Data 2016; 3: 160018. https://www.nature.com/articles/sdata201618%22

Wagenmakers, E., Sarafoglou, A., & Aczel, B. (2022, August 15). Facing the Unknown Unknowns of Data Analysis. https://doi.org/10.31234/osf.io/mjw2c

https://www.go-fair.org/fair-principles/

Make reporting guidelines mandatory

Randomised trials	CONSORT	Extensions	Other
Observational studies	STROBE	Extensions	Other
Systematic reviews	PRISMA	Extensions	Other
Case reports	CARE	Extensions	Other
Qualitative research	SRQR	COREQ	Other
Diagnostic / prognostic studies	STARD	TRIPOD	Other
Quality improvement studies	SQUIRE		Other
Economic evaluations	CHEERS		Other
Animal pre-clinical studies	ARRIVE		Other
Study protocols	SPIRIT	PRISMA-P	Other
Clinical practice guidelines	AGREE	RIGHT	Other

equator network

Enhancing the QUAlity and Transparency Of health Research

N = 554

16

http://www.equator-network.org/

National Survey on **Research Integrity**

Gowri Gopalakrishna

www.nsri.nl

@SurveyIntegrity

Gopalakrishna G, ter Riet G, Vink G, Stoop I, Wicherts J M, Bouter L. Prevalence of questionable research practices, research misconduct and their potential explanatory factors: a survey among academic researchers in The Netherlands. PLoS One 2022; 17: e0263023. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263023

Gopalakrishna G, Wicherts J M, Vink G, Stoop I, van den Akker O, ter Riet G, Bouter L. Prevalence of responsible research practices among academics in The Netherlands [version 2; peer review: 2 approved with reservations]. F1000Research 2022; 11: 471. https://f1000research.com/articles/11-471/v2

Most prevalent (5/11) QRPs (score 5,6,7)	Prevalence (%)
Not submitting or resubmitting a valid negative publication	17.5
Insufficient mentioning of study flaws and limitations in publications	17.0
Insufficiently supervised or mentored junior co-workers	15.0
Insufficient attention to equipment, skills or expertise	14.7
Inadequate notes of research proces	14.5

National Survey on Research Integrity

Gopalakrishna G, ter Riet G, Vink G, Stoop I, Wicherts J M, Bouter L. Prevalence of questionable research practices, research misconduct and their potential explanatory factors: a survey among academic researchers in The Netherlands. PLoS One 2022; 17: e0263023. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263023

QRP/FF	Prevalence (%)
Any Frequent QRP (at least 1/11 QRPs with a score of 5,6,7)	51.3
Fabrication (making up data or results)	4.3
Falsification (manipulating research materials, data or results)	4.2

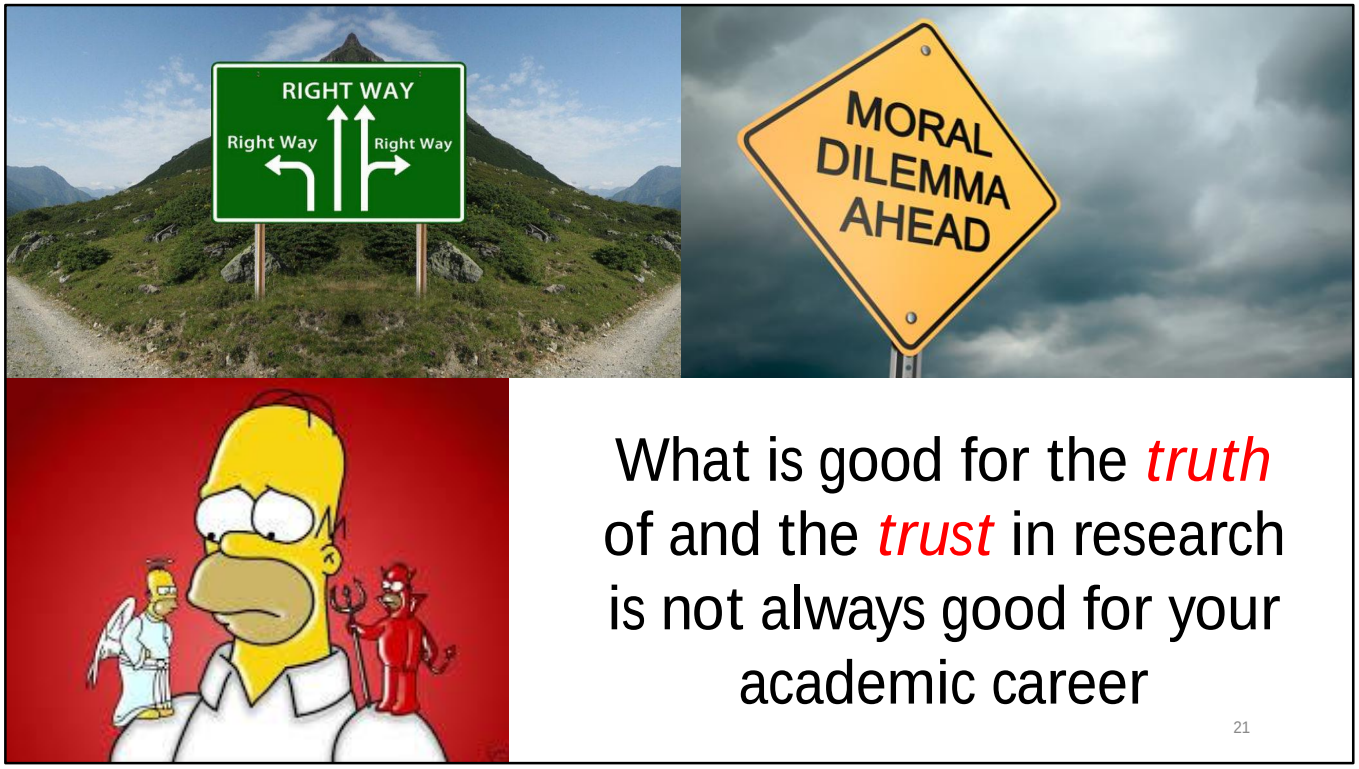
National Survey on **Research Integrity**

Gopalakrishna G, ter Riet G, Vink G, Stoop I, Wicherts J M, Bouter L. Prevalence of questionable research practices, research misconduct and their potential explanatory factors: a survey among academic researchers in The Netherlands. PLoS One 2022; 17: e0263023. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263023

Explanatory Factors	QRP	FF	RRP
Likelihood of detection by reviewers		↓	
Support of research integrity norms	↓	↓	↑
Supervision for survival	↑		
Responsible supervision	↓		↑
Publication pressure	↑		↓

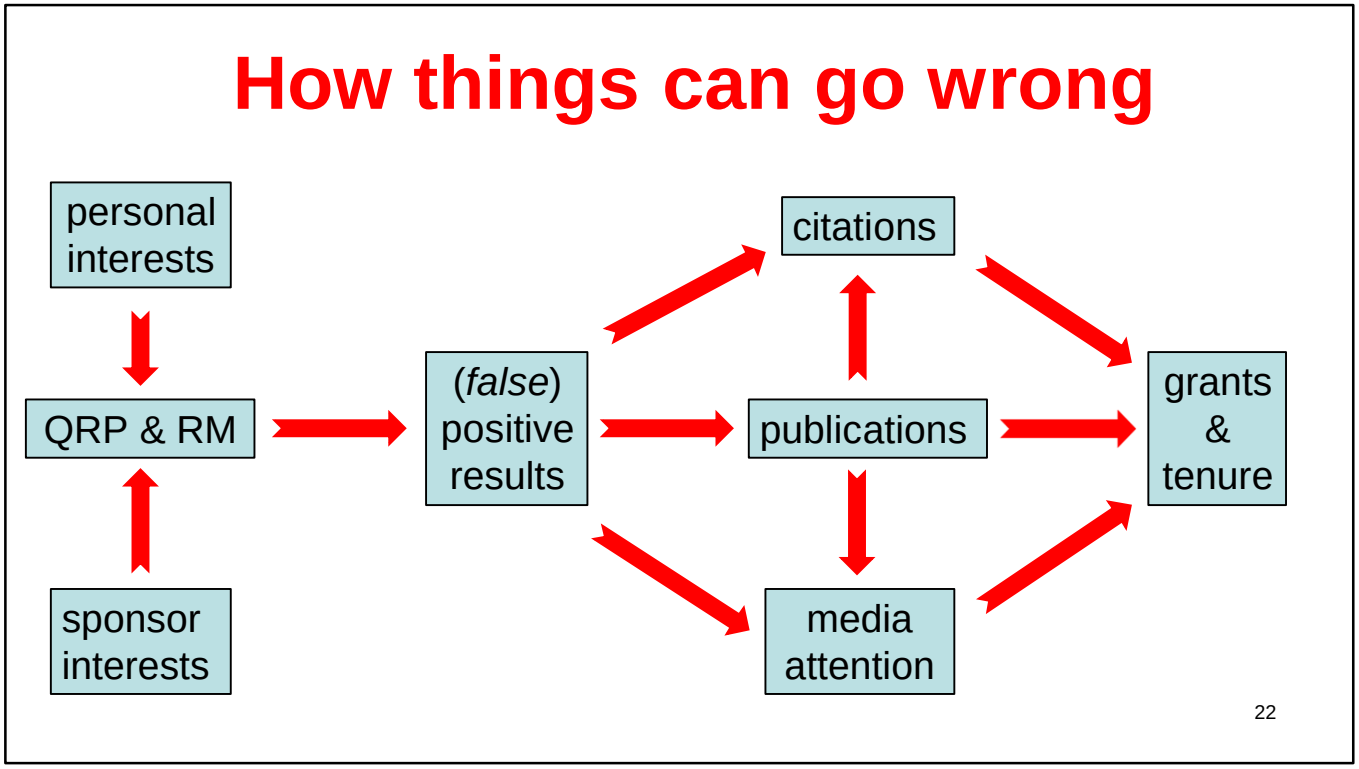
National Survey on **Research Integrity**

Gopalakrishna G, Wicherts J M, Vink G, Stoop I, van den Akker O, ter Riet G, Bouter L. Prevalence of responsible research practices among academics in The Netherlands [version 2; peer review: 2 approved with reservations]. F1000Research 2022; 11: 471. https://f1000research.com/articles/11-471/v2



Many rewards in academia are linked to having positive and spectacular results as these are published more easily in high impact journals and will be cited more often.

The various Questionable Research Practices (QRPs) have in common that they can effectively help to get these positive and spectacular results.



This slide shows – in a simplified way – how things can go wrong.

In most disciplines the proportion of papers reporting positive results increases over time. Positive results are published and cited more often, and also get more media attention. This will probably increase the likelihood of getting grants and tenure. We have also some evidence that conflicts of interest and sponsor interests may lead to sloppy science or worse. QRP and RM can effectively help to get (false) positive results.

Negative findings are so unpopular that often these are not reported at all. This mechanism will lead to publication bias, selective reporting and selective citation. Especially small studies with positive outcomes will predominantly be chance findings. These phenomena will distort the published record and can explain the large replication difficulties some fields (e.g. preclinical research) experience.

Personal interests and sponsor interests can lead to QRP and RM also if researchers are not aware of it. Many of us want to please our sponsor with a view to motivate them to keep funding our work. That could lead for instance to subtle flaws in the study design, to selective reporting and to spin in the report of the results of the study.

There is evidence for some of the relations suggested in this slide, but no or only little evidence for most of them. We really need more solid empirical research to clarify how

these things work. Gaining this knowledge is important for effectively fostering RCR and preventing QRP and RM.

Functioning of moral compass depends on:

§ Individual factors:

virtuousness of the individual

§ Institutional factors:

research climate in the lab

§ Systemic factors:

adequate incentives

Kent BA, Holman C, Amoako E, Antonietti A, Azam JM, Ballhausen H, et al. Recommendations for empowering early career researchers to improve research culture and practice. PLoS Biol 2022; 20: e3001680. https://doi.org/10.1371/journal.pbio.3001680

Bouter LM. What research institutions can do to foster research integrity. Journal of Science and Engineering Ethics 2020; 26: 2363-69. https://link.springer.com/article/10.1007/s11948-020-00178-5

Macleod M. Improving the reproducibility and integrity of research: what can different stakeholders contribute? BMC Research Notes 2022; 15: 146.

https://doi.org/10.1186/s13104-022-06030-2

Mertonian norms

Communism (scientific knowledge is not private property. Scientists must share it with the scientific community, otherwise knowledge cannot grow.)

Universalism (whether scientific knowledge is judged as true or false is judged by universal, objective criteria)

Disinterestedness (being committed to discovering knowledge for its own sake)

Organised scepticism (no knowledge claim is regarded as 'sacred'. Every idea open to questioning, criticism and objective investigation.

https://en.wikipedia.org/wiki/Mertonian_norms

Originally published as: Merton RK. Science and technology in a democratic order. Journal of Legal and Political Sociology. 1942; 1: 115-26.
Reproduced as Chapter 13 (p. 267 – 78) of Merton RK. The sociology of science: theoretical and empirical investigations. Chicago, University of Chicago Press, 1973.

Hoekstra R, Vazire S. Aspiring to greater intellectual humility in science. Nature Human Behavior 2021; 5: 1602–1607. https://doi.org/10.1038/s41562-021-01203-8

nature human behaviour

PERSPECTIVE

https://doi.org/10.1038/s41562-021-01203-8

Check for updates

Aspiring to greater intellectual humility in science

Rink Hoekstra[1,4] and Simine Vazire[2,3,4]

0. Title and abstract	0.1. The abstract should describe the limitations of the study and boundary conditions of the conclusion(s)
	0.2. Titles should not state or imply stronger claims than are justified (for example, causal claims withou strong evidence)
1. Introduction	1.1. The novelty of research should not be exaggerated
	1.2. Selective citation should not be used to create a false sense of consistency or conflict in the literatur
2. Methods	2.1. The methods section should provide all the details that a reader would need to evaluate the soundness of the methods and to conduct a direct replication
	2.2. The timing of decisions about data collection, transformations, exclusions and analyses should be documented and shared
3. Results	3.1. Detailed information about the data and results (including informative plots and information about uncertainty) should be provided
	3.2. It should be transparent which analyses were planned and where those plans were documented; weaker conclusions should be drawn to the extent that analyses were susceptible to data-dependent decision-making

https://doi.org/10.1038/s41562-021-01203-8

nature human behaviour

PERSPECTIVE

https://doi.org/10.1038/s41562-021-01203-8

Check for updates

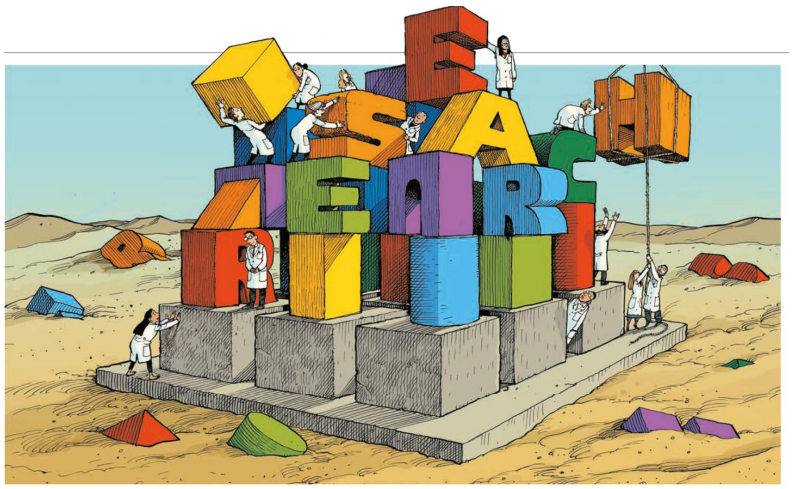
Aspiring to greater intellectual humility in science

Rink Hoekstra[1,4] and Simine Vazire[2,3,4]

4. Discussion	4.1. The statistical uncertainty of results should be incorporated into the narrative conclusions drawn from the results
	4.2. The research summary should capture the full range of results (for example, include our 'most damning result')
	4.3. Causal claims should be only as strong as the internal validity of the study allows
	4.4. Claims about generalizability should be only as strong as the sampling of participants, stimuli and settings allows
	4.5. All conclusions should be calibrated to the confidence in the construct validity of the measures and manipulations
	4.6. Alternative interpretations should be presented in their strongest possible form ('steelmanned')
	4.7. A discussion of the limitations should be incorporated throughout the discussion section, rather than bracketed off in a subsection
5. Post publication guidance for authors	5.1. Insist that press releases and reporters capture the limitations of the work, and correct outlets that exaggerate or misrepresent
	5.2. Encourage criticism, correction and replication of the work, and respond non-defensively when errors or contradictory evidence are brought to light
	5.3. When appropriate, retract papers, issue corrections or publish 'loss of confidence' statements

https://doi.org/10.1038/s41562-021-01203-8

Nature 2020; 586: 358-60



Research integrity: nine ways to move from talk to walk

TOOLBOX

114 guidelines for RPOs

25 guidelines for RFOs

27

Mejlgaard N, Bouter LM, Gaskell G, Kavouras P, Allum N, Bendtsen AK, Charitidis CA, Claesen N, Dierickx K, Domaradzka A, Reyes Elizondo A, Foeger N, Hiney M, Kaltenbrunner W, Labib K, Marušić A, Sørensen MP, Ravn T, Ščepanović R, Tijdink JK, Veltri GA. Research integrity: nine ways to move from talk to walk. Nature 2020; 586: 358-60. https://www.nature.com/articles/d41586-020-02847-8

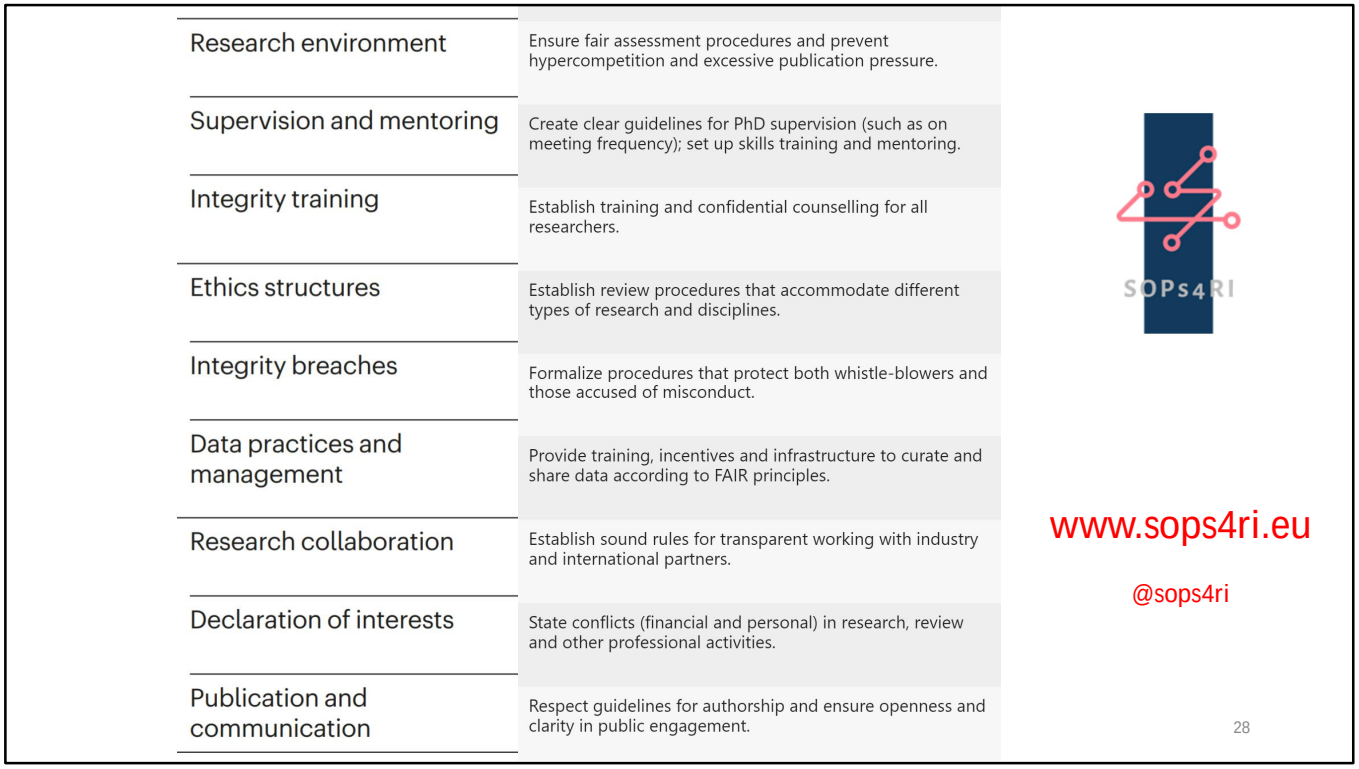
www.sops4ri.eu

The European Code of Conduct for Research Integrity (http://www.allea.org/wp-content/uploads/2017/03/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf) was published in 2017 and made mandatory for research sponsored by the EU (Horizon 2020 and Horizon Europe). See page 6 of Horizon Europe Programme Standard Application Form (https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/temp-form/af/af_he-ria-ia_en.pdf) states:

We declare that the proposal complies with ethical principles (including the highest standards of research integrity as set out in the ALLEA European Code of Conduct for Research Integrity, as well as applicable international and national law, including the Charter of Fundamental Rights of the European Union and the European Convention on Human Rights and its Supplementary Protocols. Appropriate procedures, policies and structures are in place to foster responsible research practices, to prevent questionable

research practices and research misconduct, and to handle allegations of breaches of the principles and standards in the Code of Conduct.

In addition, the Horizon Europe hyperlink for the *Appropriate procedures, policies and structures opens the Guideline for Promoting Research Integrity in Research Performing Organisations is:* https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/guideline-for-promoting-research-integrity-in-research-performing-organisations_horizon_en.pdf) by the SOPs4RI (https://sops4ri.eu/



Mejlgaard N, Bouter LM, Gaskell G, Kavouras P, Allum N, Bendtsen AK, Charitidis CA, Claesen N, Dierickx K, Domaradzka A, Reyes Elizondo A, Foeger N, Hiney M, Kaltenbrunner W, Labib K, Marušić A, Sørensen MP, Ravn T, Ščepanović R, Tijdink JK, Veltri GA. Research integrity: nine ways to move from talk to walk. Nature 2020; 586: 358-60. https://www.nature.com/articles/d41586-020-02847-8

www.sops4ri.eu

The European Code of Conduct for Research Integrity (http://www.allea.org/wp-content/uploads/2017/03/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf) was published in 2017 and made mandatory for research sponsored by the EU (Horizon 2020 and Horizon Europe). See page 6 of Horizon Europe Programme Standard Application Form (https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/temp-form/af/af_he-ria-ia_en.pdf) states:

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research practices and research misconduct, and to handle allegations of breaches of the principles and standards in the Code of Conduct.

The hyperlink of Appropriate procedures, policies and structures opens the Guideline for Promoting Research Integrity in Research Performing Organisations (https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/guideline-for-promoting-research-integrity-in-research-performing-organisations_horizon_en.pdf) by the SOPs4RI (https://sops4ri.eu/).

Guidelines for research institutions on the **research integrity education of bachelor, master and PhD students**

Guidelines for research institutions on the **research integrity education of post-doctorate and senior researchers**

Guidelines for research institutions on the **research integrity education of institutional research integrity stakeholders**

Guidelines for research institutions on **continuous research integrity education**

www.sops4ri.eu

Labib K, Evans N, Pizzolato D, Aubert Bonn N, Widdershoven G, Bouter L, Konach T, Langendam M, Kris Dierickx K, Tijdink JK. Co-creating research integrity education guidelines for research institutions. MetaArXiv (3 March 2022). https://osf.io/preprints/metaarxiv/gh4cn/

Labib K. developing guidelines for research institutions: journey towards research integrity. PhD Thesis. https://www.nrin.nl/docman/theses/127-phd-thesis-krishma-labib/file

Research integrity governance modes

Krishma Labib

	Market	Hierarchy	Network
Drivers	Incentives	Formal authority	Trust and solidarity
Climate	Competition	Bureaucracy	Cooperation

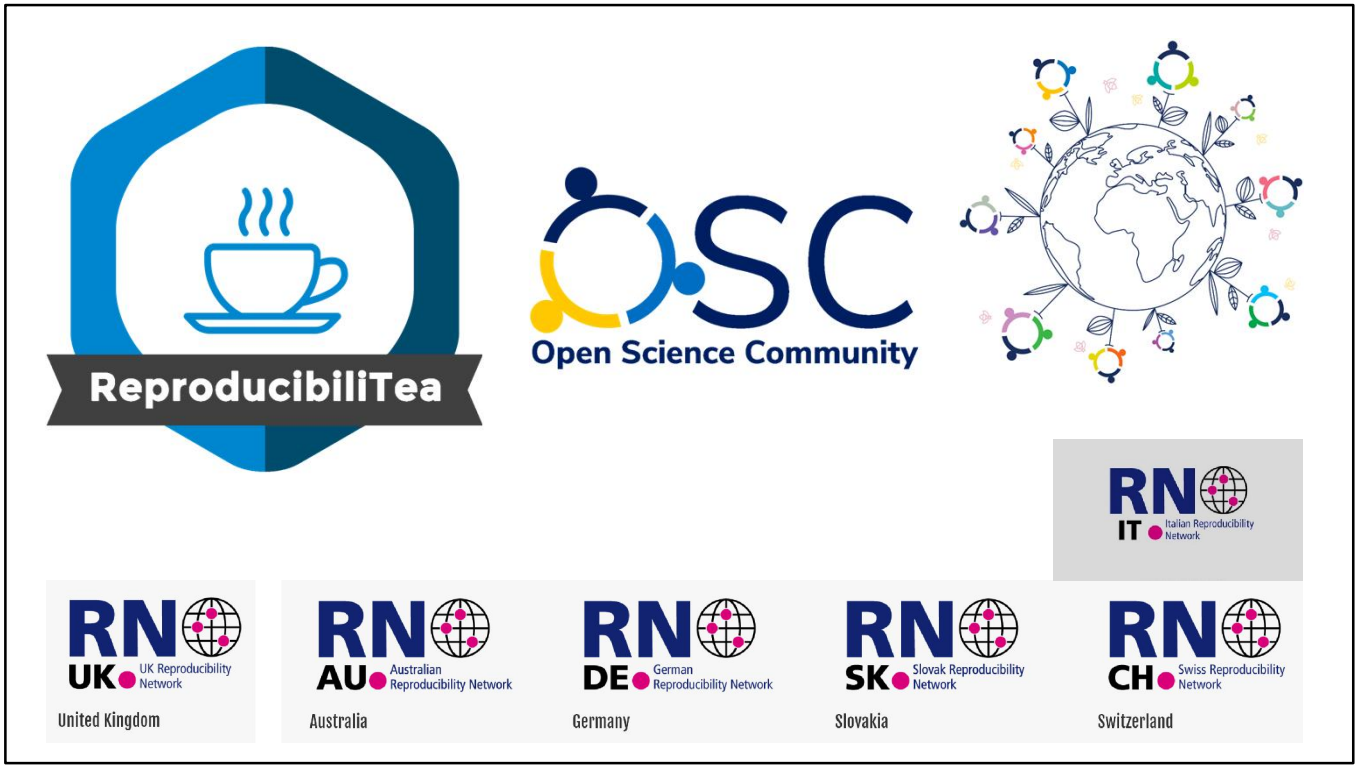
Labib K, Tijdink JK, Sijtsma K, Bouter L, Evans N, Widdershoven G. How to combine rules and commitment in fostering research integrity? MetaArXiv (28 July 2022). https://osf.io/preprints/metaarxiv/sx58q/

Labib K. developing guidelines for research institutions: journey towards research integrity. PhD Thesis. https://www.nrin.nl/docman/theses/127-phd-thesis-krishma-labib/file

Superb supervision: A pilot study on training supervisors to convey responsible research practices onto their PhD candidates

Tamarinde Haven, Lex Bouter, Louise Mennen & Joeri Tijdink

Haven T, Bouter L, Mennen L, Tijdink J. Superb Supervision: a pilot study on training supervisors to convey responsible research practices onto their PhD students. Accountability in Research 2022; 1-18.
https://doi.org/10.1080/08989621.2022.2071153



Early career researchers can drive reform and make the difference. Here are some examples of networks that accelerate local change.

Kent BA, Holman C, Amoako E, Antonietti A, Azam JM, Ballhausen H, et al. Recommendations for empowering early career researchers to improve research culture and practice. PLoS Biol 2022; 20: e3001680. https://doi.org/10.1371/journal.pbio.3001680

https://www.ukrn.org/

https://reproducibilitea.org/

https://inosc-starter-kit.netlify.app/

Assessment of researchers

- Grant applications
- Vacancies
- Promotion
- Tenure
- Awards

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Incentives works well

For *intended* effects:

- More publications and citations

But also for *unintended* effects:

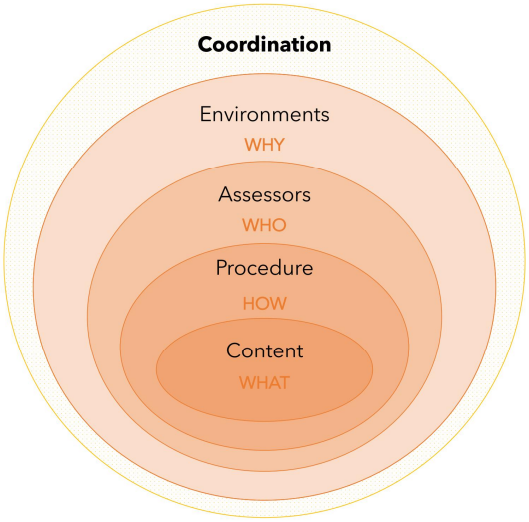
- Focus on quantity, not quality
- More plagiarism and duplicate publication
- More ‘salami slicing’, gift authorship and use of predatory OA journals
- Citation cartels and fake (Paper Mill) papers and fake peer reviewers
- Stronger ‘Matthew effect’, less equity
- Less time-consuming responsible research practices

All incentives can and will be gamed if stakes are high [34]

Research assessments should recognize responsible research practices

Narrative review of a lively debate and promising developments

Noémie Aubert Bonn[1] and Lex Bouter[2]



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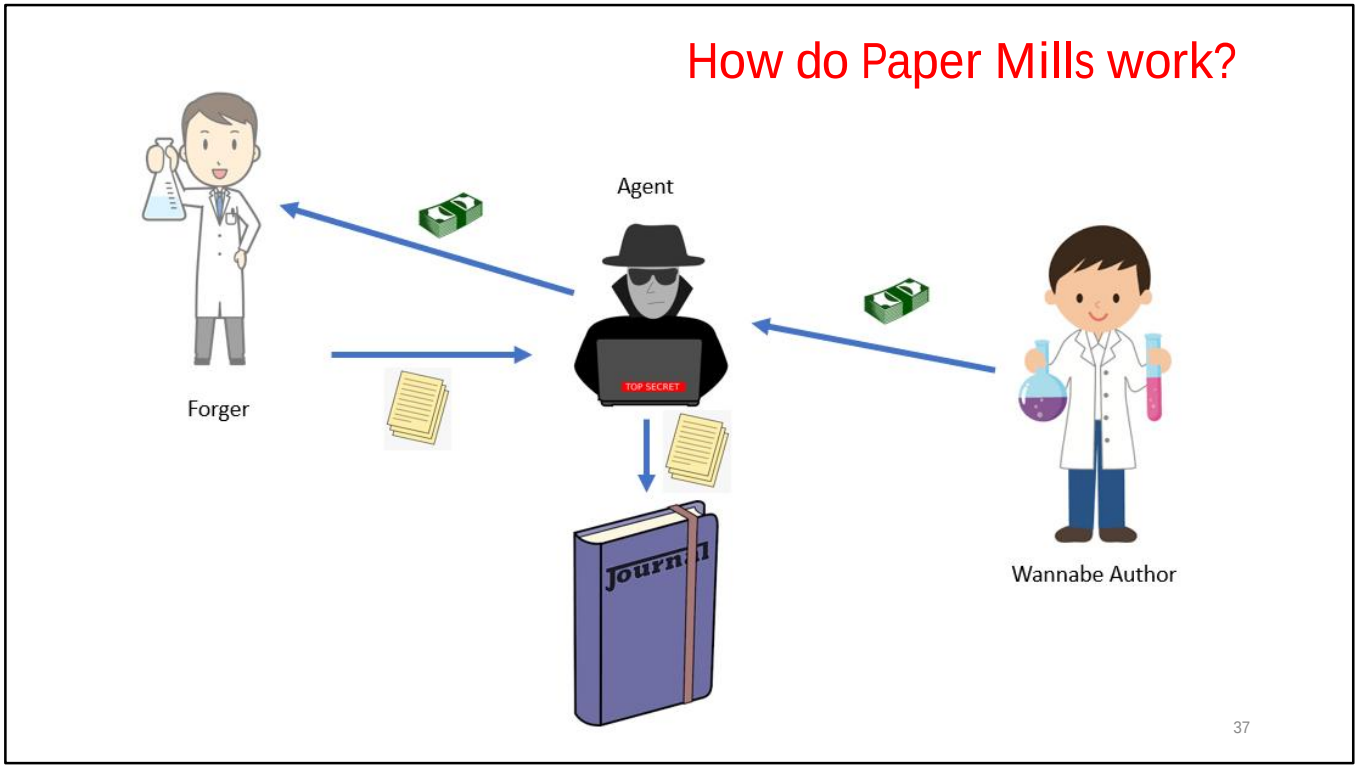
https://www.sfdora.org/

VSNU, NFU, KNAW, NWO and ZonMw: 'Recognition and Awards of Academics'

https://www.vsnu.nl/en_GB/Recognition-and-rewards-of-academics.html

https://www.vsnu.nl/files/documenten/Domeinen/Onderzoek/Position%20paper%20Room%20for%20everyone%E2%80%99s%20talent.pdf

More initiatives to improve the assessment of researchers are reviewed in:
Aubert Bonn N, Bouter L. Research assessments should recognize responsible research practices: narrative review of a lively debate and promising developments. MetaArXiv (19 July 2021). https://osf.io/preprints/metaarxiv/82rmj



Fake research publications are produced predominantly by Paper Mills.

https://publisherad.medium.com/3-kinds-of-papermills-14993c37ebfa

Fake publications

- Produced by individual researchers or **Paper Mills**:
  - **Fabrication** from scratch (*by humans or software*)
  - Fabrication by **plagiarism** (*by humans or software*)
  - Authorship brokering → **fake authors**
- **Fake reviewers**
- **Fake** guest **editors** (*of supplements on fake conferences*)
- Predatory open access journals (incl. **fake journals**)

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We have no solid data on the frequency of these phenomena, but they definitely seem to be on the rise.

COPE & STM report on paper mills:
https://publicationethics.org/sites/default/files/paper-mills-cope-stm-research-report.pdf

Paper mill worries:

https://www.nature.com/articles/d41586-021-00733-5

https://www.nature.com/articles/d41586-022-02997-x

https://www.nature.com/articles/d41586-020-02445-8

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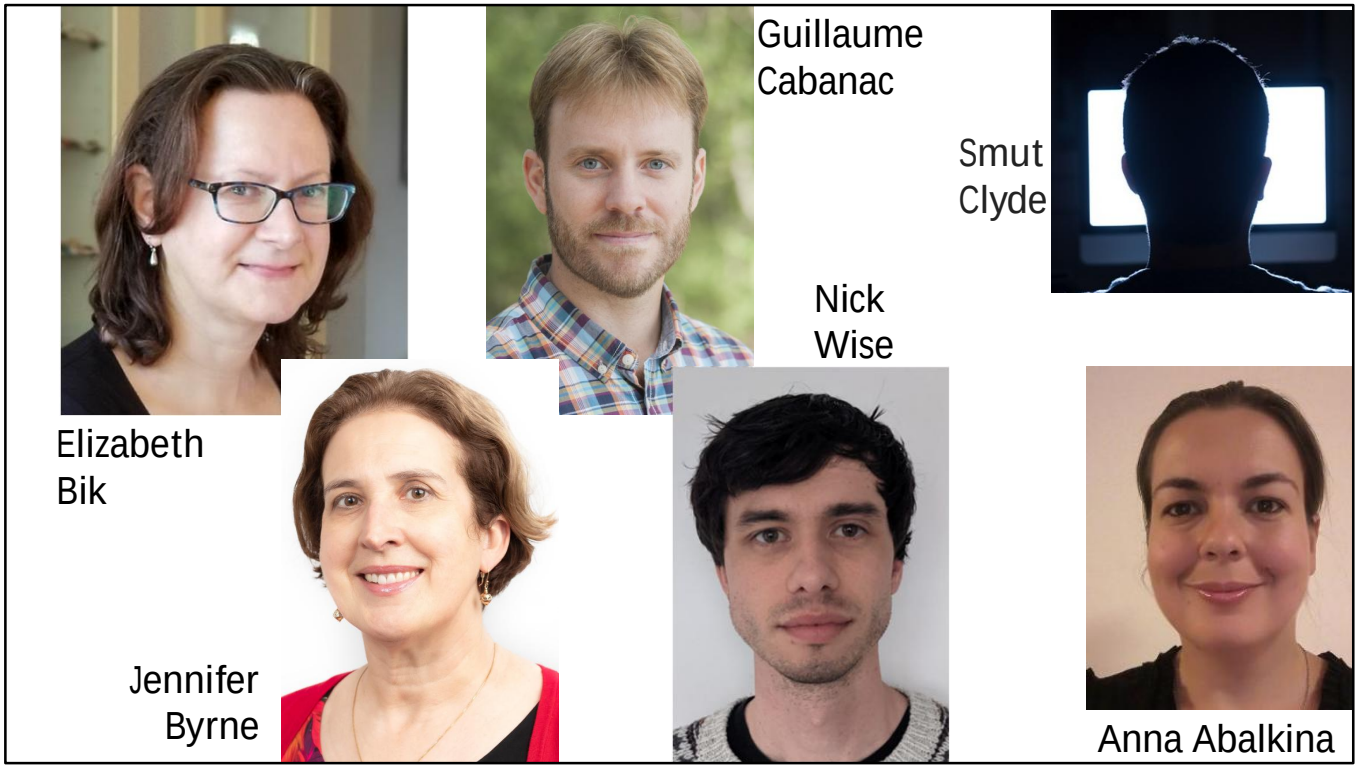
https://www.nature.com/articles/d41586-022-01666-3

https://retractionwatch.com/2019/07/18/exclusive-russian-site-says-it-has-brokered-authorships-for-more-than-10000-researchers/



Fake paper detectives:

https://www.nature.com/articles/d41586-020-01363-z

https://www.nature.com/articles/d41586-019-00439-9

https://www.nature.com/articles/d41586-021-02134-0

https://retractionwatch.com/2022/10/25/meet-a-sleuth-whose-work-has-resulted-in-more-than-850-retractions/

https://www.nature.com/articles/d41586-022-02099-8

Problematic Paper Screener

Tortured phrases	*Established phrases*
bosom peril	*breast cancer*
counterfeit consciousness	*artificial intelligence*
profound neural organization	*deep neural network*
extreme intense respiratory syndrome	*severe acute respiratory syndrome*
blunder rate	*error rate*
arbitrary woodland	*random forest*

- **Automated paraphrasing tools** to avoid plagiarism detection
- Papers written by **artificial intelligence** language models like GPT-2
- OpenAI's GPT-2 detector can screen for this

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https://www.irit.fr/~Guillaume.Cabanac/problematic-paper-screener

https://thebulletin.org/2022/01/bosom-peril-is-not-breast-cancer-how-weird-computer-generated-phrases-help-researchers-find-scientific-publishing-fraud/

What can journals do to prevent fake papers?

- Have open methods, open codes, open data and open peer review
- Check reviewer identity and quality of review reports
- Perform quality checks in editorial office (always or when indicated):
  - text recycling (e.g. iThenticate)
  - image duplication (e.g. SILA)
  - references to retracted papers (e.g. Scite's reference checker)
  - data integrity (e.g. statcheck)
  - > 20 publishers collaborate in STM Integrity Hub

41

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Gray R. (26 May 2018) The inclusion of retracted trials in systematic reviews: implications for patients' safety. Research Ethics Monthly. https://ahrecs.com/research-integrity/the-inclusion-of-retracted-trials-in-systematic-reviews-implications-for-patients-safety

https://medium.com/a-academic-librarians-thoughts-on-open-access/checking-for-retractions-other-quality-checks-on-your-manuscript-before-journal-submissions-1f8ad32a44cf

What can research institutes do to prevent fake papers?

- Mandate open methods, open codes, and open data
- Offer good training in research integrity and research methodology
- Have good supervision and quality control installed
- Investigate signals of fake papers rapidly and inform journals
- Reform researcher assessment with a view to prevent perverse incentives

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Predatory Open Access journals

- Offer **no value for money** (APC)
- No or poor quality **peer review**
- **Accept** almost all submissions
- Agressive and misleading **marketing**
- **Directory** of Open Access Journals
- Beall's (*outdated*) and Cabells (*paywalled*) **lists**
- Quality Open Access Market (*Tripadvisor*)

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http://www.ohri.ca/journalology/predatory-journals-resource-page

https://doaj.org/

https://beallslist.net/

https://www2.cabells.com/about-predatory

https://www.qoam.eu/

Strinzel M, Severin A, Milzow K, Egger M. Blacklists and Whitelists To Tackle Predatory Publishing: a Cross-Sectional Comparison and Thematic Analysis. mBio 2019; 10: e00411-19 https://journals.asm.org/doi/epdf/10.1128/mBio.00411-19

Grudniewicz A, Moher, D, Cobey KD and 32 co-authors. Predatory journals: no definition, no defence. Nature 2019; 576: 210-2. https://media-nature-com.vu-nl.idm.oclc.org/original/magazine-assets/d41586-019-03759-y/d41586-019-03759-y.pdf

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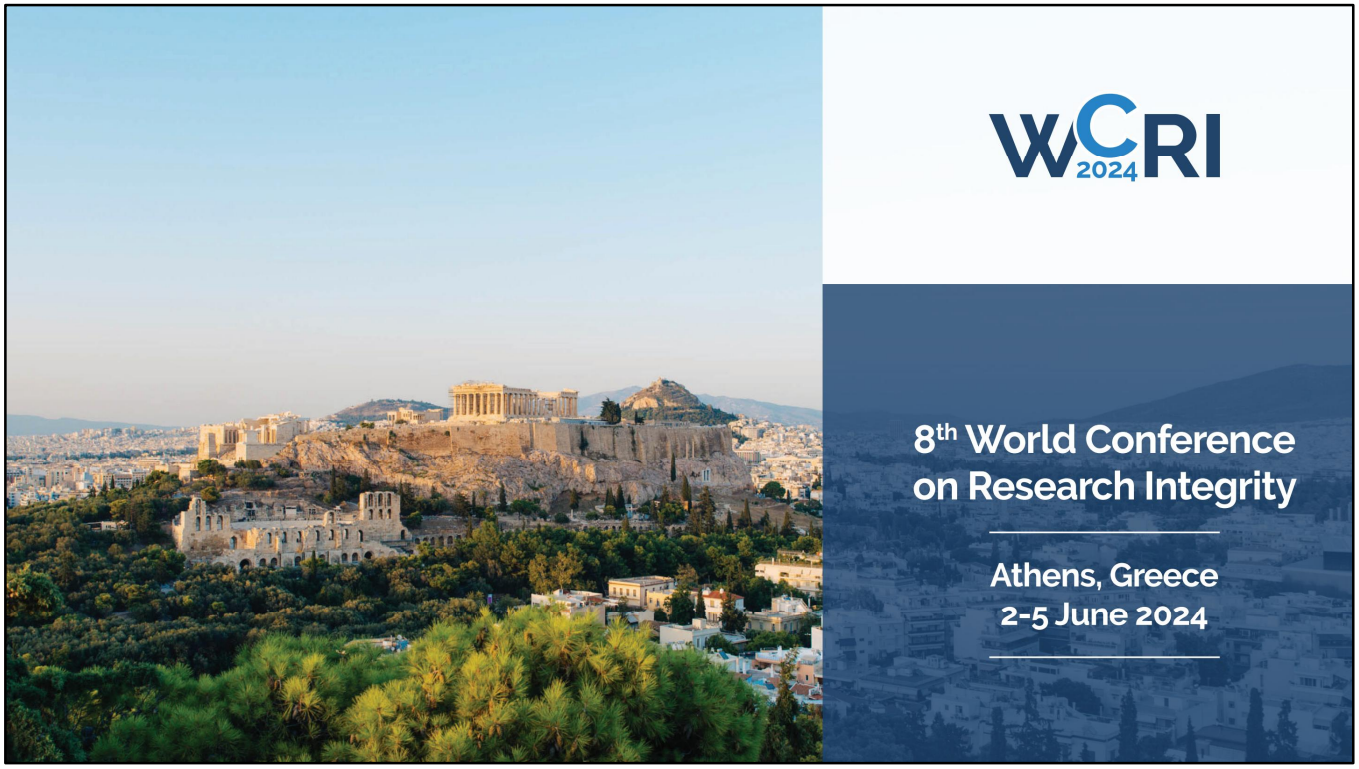
WORLD CONFERENCES ON RESEARCH INTEGRITY

Website: www.wcrif.org
Twitter: @WCRIFoundation
Vimeo: https://bit.ly/3pvv0tZ


WCRI 2024
8th World Conference on Research Integrity
Athens, Greece
2-5 June 2024