What can research institutes do to foster research integrity?

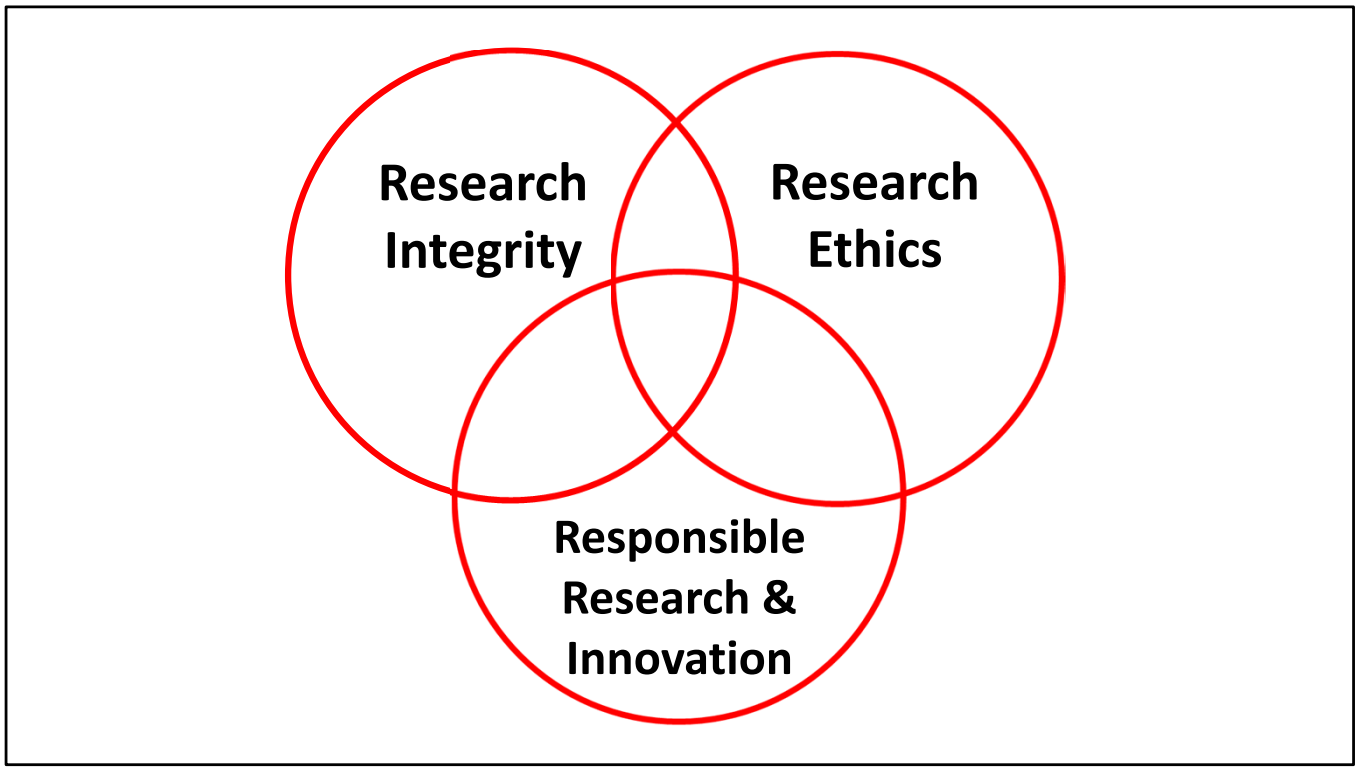
Lex Bouter

60 minutes (including 10 minutes Q&A) – lecture at the Stellenbosch Forum, Wednesday 11 March 2020, Centre for Research on Evaluation, Science and Technology, Stellenbosch University, South Africa

Main message

- QRPs are more important than FFP
- Researchers need support to prevent QRPs
- Research institutes have duties of care

2



Research integrity (RI) concerns behaviors of researchers that hamper validity (truth) of research or trust in science and between scientists. These behaviors are usually indicated as research misconduct (RM) and questionable research practices (QRP). Positively framed research integrity is equivalent to responsible conduct of research (RCR). RI standards can be ethical, methodological or both.

Research ethics (RE) concerns the ethical considerations of research with humans and animals, including the ethical reflection on the benefits and harms involved for them. RE standards can be ethical, methodological or both.

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

LEFT OUT OF THE PICTURE, BUT PARTLY OVERLAPPING WITH RI, RE and/or RRI:

Academic integrity deals with the professional ethics and integrity standards of e.g. doctors, bankers, lawyers and psychologists or with the ethics and integrity standards of teaching in higher education.

Financial Integrity concerns the responsible use of resources and the absence of

financial fraud.

Discrimination and **intimidation** (bullying or worse) are breaches of integrity and ethical standards in general that sadly also happen in Academia.

Research Integrity (RI) concerns behaviors of researchers that hamper validity (**truth**) of research or **trust** in science and between scientists.

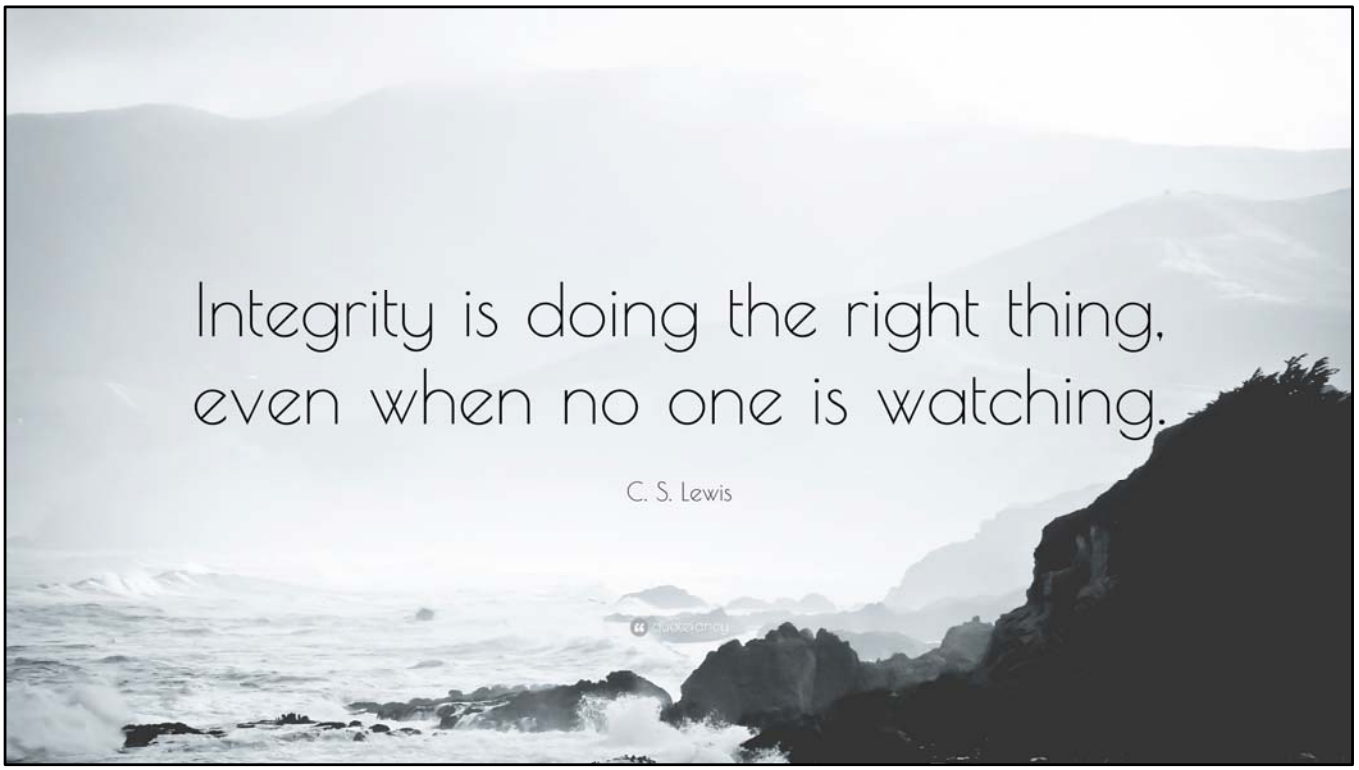
Research Ethics (RE) concerns the ethical considerations of research with **humans** and **animals**.

Responsible Research & Innovation (RRI) concerns the benefits and harms of research for **society** and the **environment**.

4

RI and RE standards can be ethical, methodological or both.

Methodological quality cannot be ignored: bad studies are unethical and a waste of resources.



Ironically this seems to be and instance of inadequate referencing by repeating an incorrect attribution.

In that sense it's an example of (unintentional) plagiarism.

Quote is NOT of C.S. Lewis – probably it is a paraphrase of a Charles Marshall quote in Shattering the Glass Slipper

http://www.cslewis.org/aboutus/faq/quotes-misattributed/
http://www.essentialcslewis.com/2015/11/22/ccslq-13-right-thing/

Research Integrity

- **Codes of Conduct** explain what the right thing is
- Aspirational codes focus on **virtues and values**
- Normative codes contain **do's and don'ts**
- **Standard Operating Procedures** make clear what is meant

Singapore Statement on Research Integrity

Preamble. The value and benefits of research are vitally dependent on the integrity of research. While there can be and are national and disciplinary differences in the way research is organized and conducted, there are also principles and professional responsibilities that are fundamental to the integrity of research wherever it is undertaken.

PRINCIPLES

Honesty in all aspects of research

Accountability in the conduct of research

Professional courtesy and fairness in working with others

Good stewardship of research on behalf of others

7

Adopted at the 2nd World Conference on Research Integrity in 2010 in Singapore. It became an informal code of conduct on the world level.

https://www.wcrif.org/documents/327-singapore-statement-a4size/file

There seems to be no South African Code of Conduct for Research Integrity.

These two documents come the nearest I was told, but they concern mainly research ethics and publication ethics.

https://www.nrf.ac.za/sites/default/files/documents/STATEMENT%20ON%20ETHICAL.pdf

https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/coc_research-resource-poor-settings_en.pdf

Spectrum of research practices

How it should be done:

Relevant, Valid, Reproducible, Efficient

Sloppy science: **34%**

Ignorance, honest error or dubious integrity

Scientific fraud: **2%**

Fabrication, Falsification, Plagiarism

3

The percentages concern the question 'did you at least once in the last 3 years engage in FF / QRP ?' and come from the highly cited meta-analysis:

Fanelli D. How Many Scientists Fabricate and Falsify Research? A Systematic Review and Meta-Analysis of Survey Data. PLoS ONE 2009; 4(5): e5738

We performed a study on the Academic Research Climate in Amsterdam that tries to both answer empirical questions and to provide input for local measures and interventions.

Website: www.amsterdamresearchclimate.nl

Preregistration of study protocol and data analysis plan: https://osf.io/x6t2q/

Publications and preprints:

- Haven TL, Tijdink JK, Martinson BC, Bouter LM. Perceptions of research integrity climate differ between academic ranks and disciplinary fields: results from a survey among academic researchers in Amsterdam. PLoS ONE 2019; 14: e0210599 (https://doi.org/10.1371/journal.pone.0210599).
- Haven TL, de Goede MEE, Oort FJ. Personally perceived publication pressure: revising the Publication Pressure Questionnaire (PPQ) by using work stress models. Research Integrity and Peer Review (2019) 4:7 (https://doi.org/10.1186/s41073-019-0066-6)
- Haven TL, Bouter LM, Smulders YM, Tijdink JK. Perceived publication pressure in

Amsterdam: survey of all disciplinary fields and academic ranks. PLoS ONE 2019; 14: e0217931. (https://doi.org/10.1371/journal.pone.0217931)

- Haven T, Tijdink J, Pasman HJ, Widdershoven G, ter Riet G, Bouter L. Do research misbehaviours differ between disciplinary fields? A mixed methods study among academic researchers in Amsterdam. Research Integrity and Peer Review 2019; 4:25. (https://doi.org/10.1186/s41073-019-0081-7)

Haven *et al. Research Integrity and Peer Review* (2019) 4:25
https://doi.org/10.1186/s41073-019-0081-7

Research Integrity and Peer Review

RESEARCH Open Access

Researchers' perceptions of research misbehaviours: a mixed methods study among academic researchers in Amsterdam

Tamarinde L. Haven[1*], Joeri K. Tijdink[1,2], H. Roeline Pasman[3], Guy Widdershoven[2], Gerben ter Riet[4,5] and Lex M. Bouter[1,6]

11

Part of a study on the Academic Research Climate in Amsterdam that tries to both answer empirical questions and to provide input for local measures and interventions.

Website: www.amsterdamresearchclimate.nl

Preregistration of study protocol and data analysis plan: https://osf.io/x6t2q/

Publications and preprints:

- Haven TL, Tijdink JK, Martinson BC, Bouter LM. Perceptions of research integrity climate differ between academic ranks and disciplinary fields: results from a survey among academic researchers in Amsterdam. PLoS ONE 2019; 14: e0210599 (https://doi.org/10.1371/journal.pone.0210599).
- Haven TL, de Goede MEE, Oort FJ. Personally perceived publication pressure: revising the Publication Pressure Questionnaire (PPQ) by using work stress models. Research Integrity and Peer Review (2019) 4:7 (https://doi.org/10.1186/s41073-019-0066-6)
- Haven TL, Bouter LM, Smulders YM, Tijdink JK. Perceived publication pressure in Amsterdam: survey of all disciplinary fields and academic ranks. PLoS ONE 2019;

14: e0217931. (https://doi.org/10.1371/journal.pone.0217931)

- Haven T, Tijdink J, Pasman HJ, Widdershoven G, ter Riet G, Bouter L. Do research misbehaviours differ between disciplinary fields? A mixed methods study among academic researchers in Amsterdam. Research Integrity and Peer Review 2019; 4:25. (https://doi.org/10.1186/s41073-019-0081-7)

Top 5 – aggregated impact

1. Insufficiently ***supervise*** or mentor junior coworkers
2. Let own ***convictions influence*** the conclusions substantially
3. Choose a clearly ***inadequate*** research ***design*** or using evidently unsuitable ***measurement instruments***
4. ***Not publish*** a valid 'negative' study
5. Give insufficient attention to the ***equipment***, ***skills*** or ***expertise*** which are essential to perform the study

12

This is the Top 5 based on the survey performed as part of the Academic Research Climate in Amsterdam (ARCA).

Based on frequency weighted impact on validity (frequency X impact on validity).

These are all questionable research practices that research institutes can do something about.

FFP turn up only in the bottom half of the top 60.

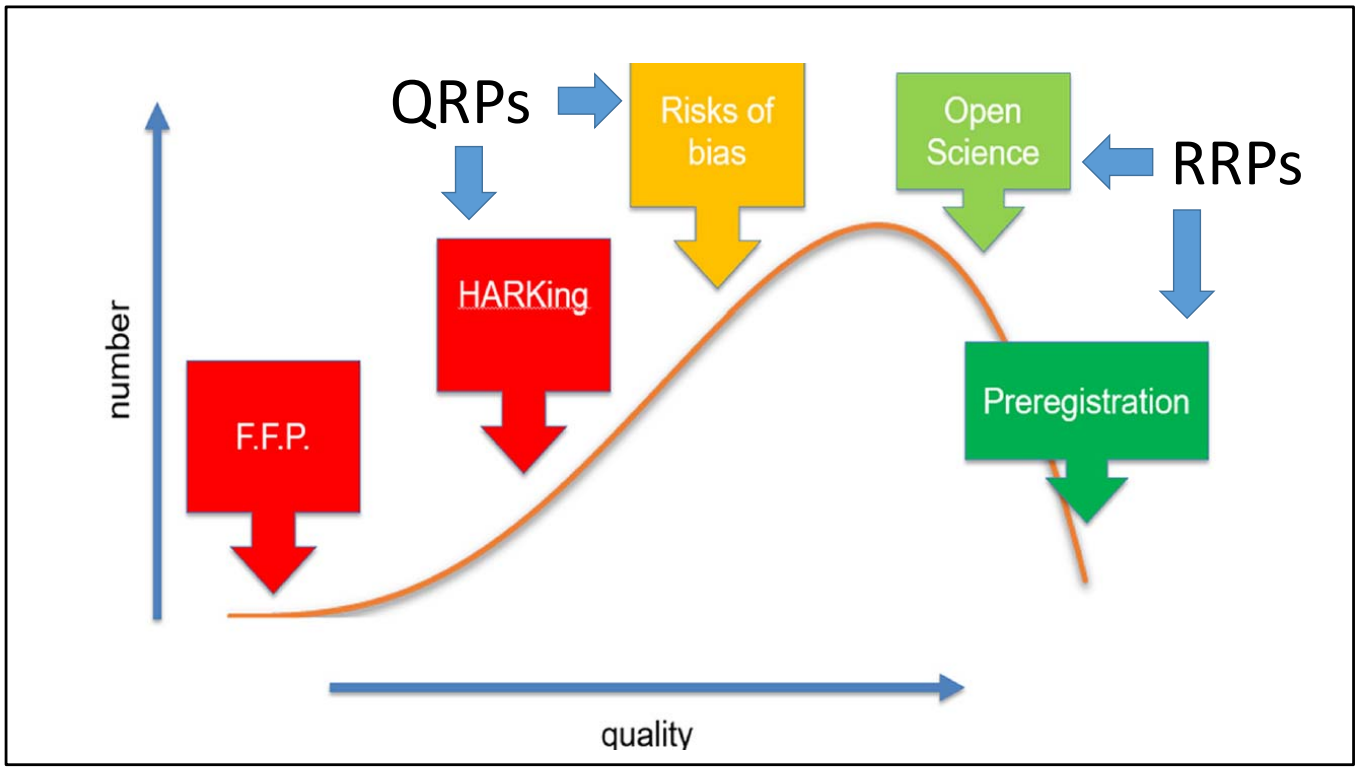
Number 2 in fact concerns non-financial conflicts of interest. But also financial interests can drive distortion of the report of the findings. Wanting to please our funders is quite human and many studies show that the conclusions of commercially funded studies are more positive. That's the reason Conflicts-of-Interests always must be reported.

In nutrition research an example of **number 3** is a study that compares hard cheese to butter and then concludes that eating hard cheese reduces blood cholesterol levels. De Goede et al – Effect of cheese consumption on blood lipids. Nutritional Reviews 2015; 73:259-75 – cited in Marion Nestle: Unsavory truth.

Website: www.amsterdamresearchclimate.nl

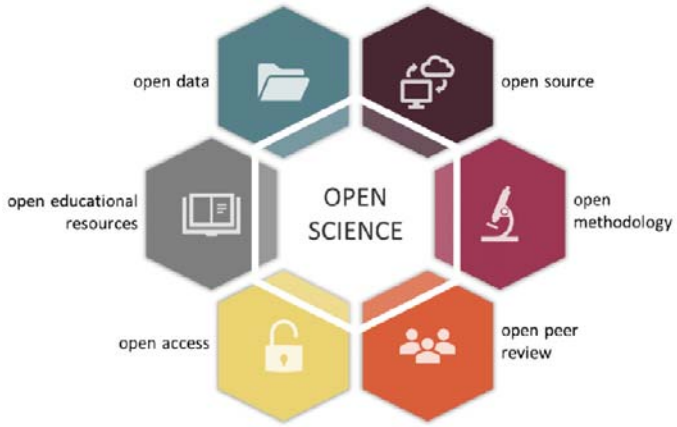
Preregistration: https://osf.io/x6t2q/

Haven T, Tijdink J, Pasman HJ, Widdershoven G, ter Riet G, Bouter L. Do research misbehaviours differ between disciplinary fields? A mixed methods study among academic researchers in Amsterdam. Research Integrity and Peer Review 2019; 4:25. (https://doi.org/10.1186/s41073-019-0081-7)



Macleod, M & Mohan, S 2019, 'Reproducibility and Rigor in Animal-Based Research', ILAR Journal. (https://doi.org/10.1093/ilar/ilz015)

Responsible Research Practices



GO FAIR

14

Open science helps in fostering research integrity by making research more transparant, reproducible and controllable.
FAIR = Findable, Accessible, Interoperable and Reusable

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

Rice and Moher - Curtailing the use of preregistration - a misused term - Perspectives on Psychological Science 2019; 14 1105-8.

Chambers C - What's next for registered reports - Nature 2019; 573 187-189.

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

NAS - Open Science by design - realizing a vision for 21th century research - Washington, 2018 (https://www.nap.edu/download/25116)

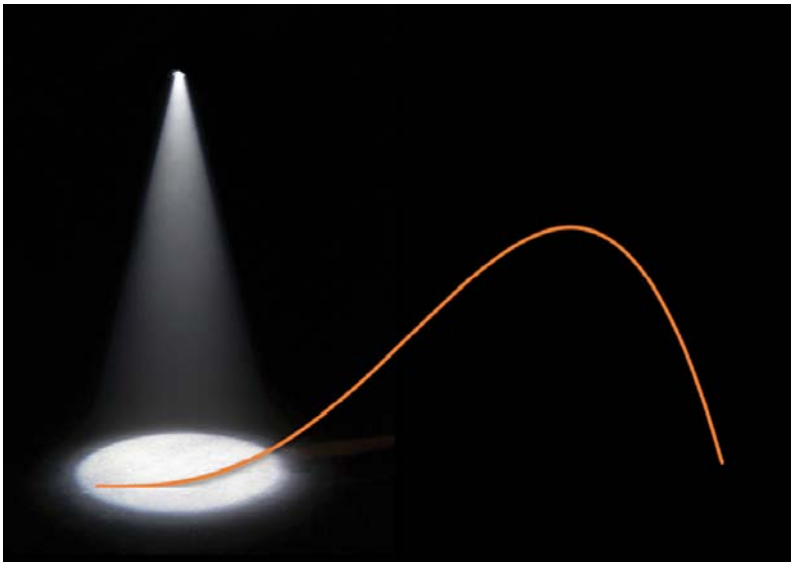
https://www.fosteropenscience.eu/

https://cos.io/

https://cos.io/rr/

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

Too much focus on FFP



15

Macleod, M & Mohan, S 2019, 'Reproducibility and Rigor in Animal-Based Research', ILAR Journal. (https://doi.org/10.1093/ilar/ilz015)

Functioning of moral compass depends on:

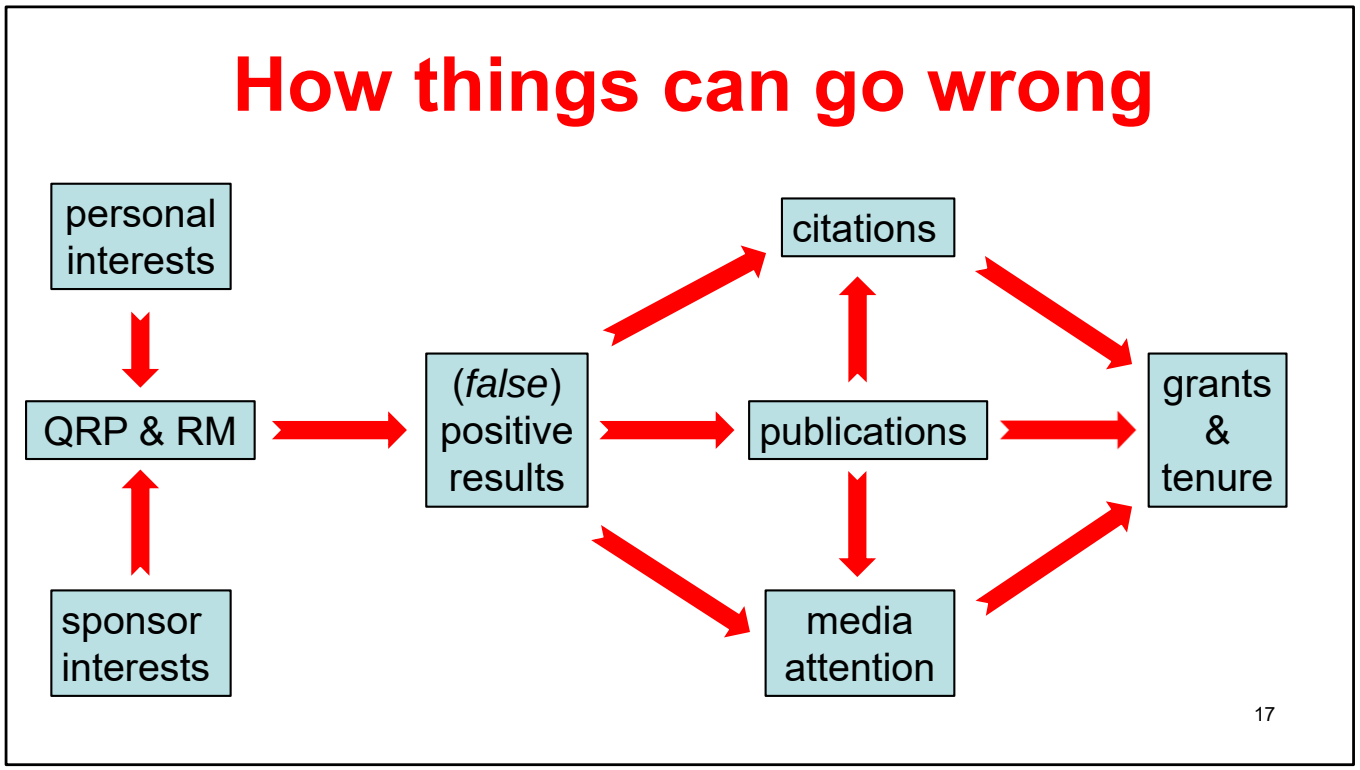
- Individual virtuousness
- Research climate
- Perverse incentives

Codes of conduct are mainly about what researchers should do themselves.

But there are also strong determinants in the research climate and the system of science.

That doesn't decrease the personal responsibility to behave well in research. In fact it makes personal responsilility larger: individual researchers also have to help to improve the research climate and the system of science.

It also means that other stakeholders have role to play: research institutions, scholarly journals and funding agencies.



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.

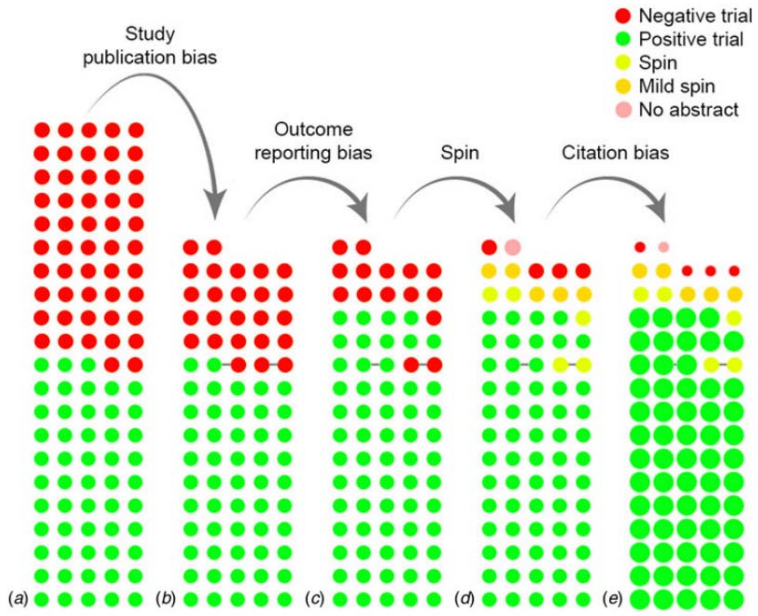
Negative findings are so unpopular that often these are not reported at all. This mechanism will lead to publication bias, selective reporting and selective citation. Especially small studies with positive outcomes will predominantly be chance findings. These phenomena will distort the published record 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.

How negative results disappear from the published literature



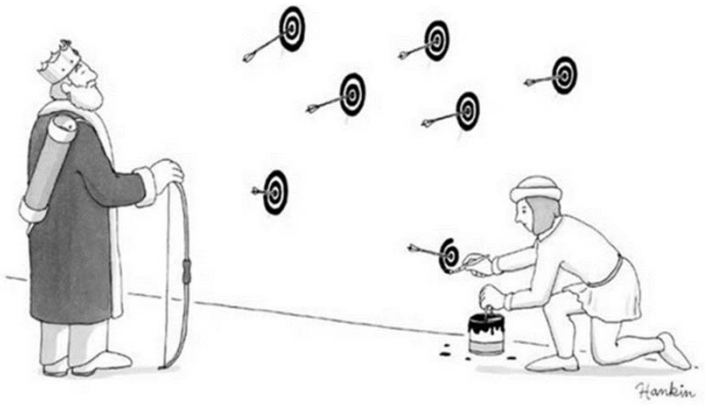
18

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 the fate of an inception cohort of 105 RCTs of the efficacy of anti-depression drugs from the FDA database. The cohort is conplete in the sense that pharmeceutical companiet must register all trials the intend to use to obtain FDA approval before embarking on data collection. The FDA considered 50% of the trials positive after carefully looking at the results.

Important tools to get positive results

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



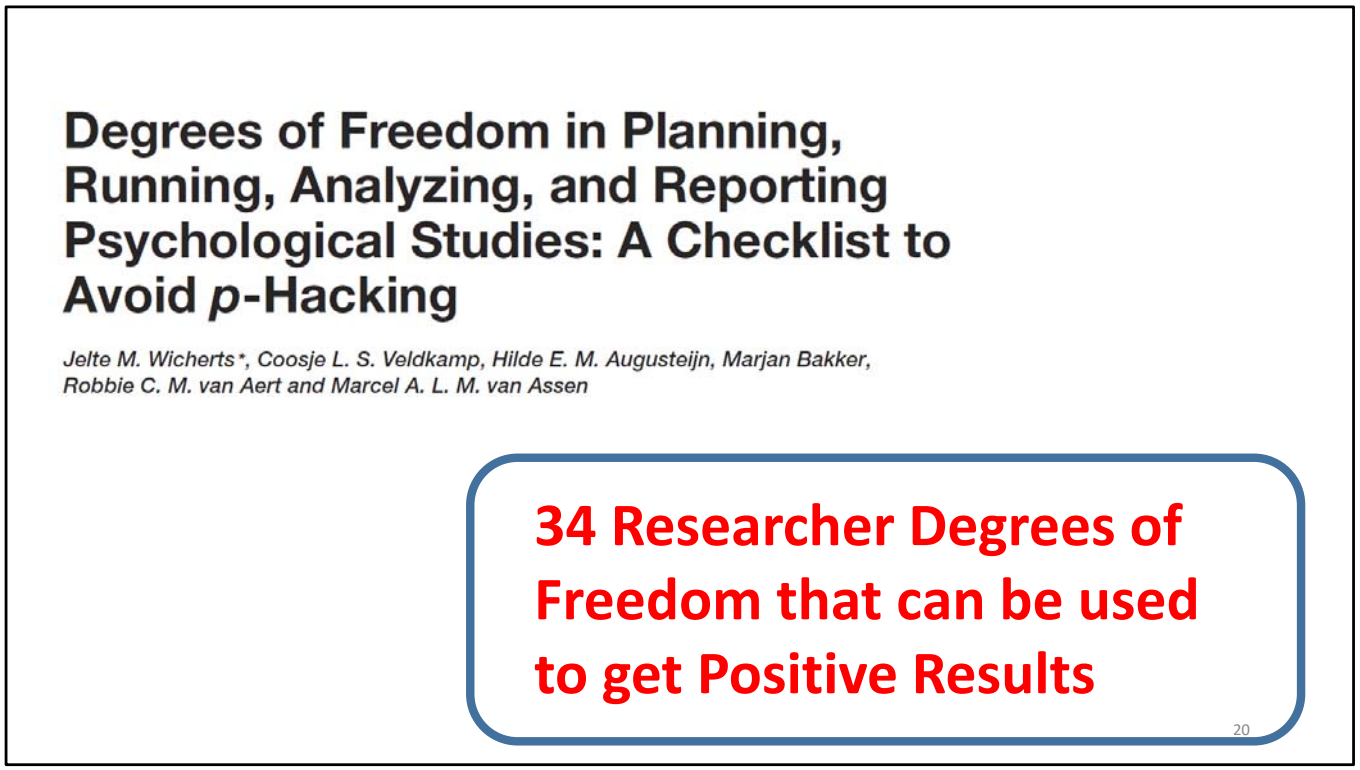
Hypothesizing After Results are Known

19

Wicherts et al - Degrees of freedom - checklist to avoid p-hacking - Front Psych 2016; 7 1832

Nosek et al - The preregistration revolution - PNAS 2018; 115 2600-6

Bouter - Fostering responsible research practices is a shared responsibility of multiple stakeholders - J Clin Epidemiol 2018; 93 143-6



Wicherts et al - Degrees of freedom - checklist to avoid p-hacking - Front Psych 2016; 7 1832

This wonderful article comes from the faculty where Diederik Stapel was dean: never waste a good crisis.

The idea of Researcher Degrees of Freedom indicates that sloppy science offers a lot of room to get the findings and conclusions you want.

Please note: we're talking about hypothesis testing research (confirmatory research), NOT about exploratory research. In the latter domain 'anything goes' as long as it's clearly stated that exploration is at issue.

See also: Wicherts – The weak spots of contemporary science (and how to fix them) - Animals 2017, 7, 90; doi:10.3390/ani7120090

Science and Engineering Ethics
https://doi.org/10.1007/s11948-020-00178-5

OPINION/COMMENTARY

What Research Institutions Can Do to Foster Research Integrity

Lex Bouter[1,2]

Received: 9 December 2019 / Accepted: 9 January 2020

21

This commentory briefly describes 7 duties of care research institutes have.

1. Have clear codes, guidelines and SOPs

That explain what is expected behaviour in operational terms

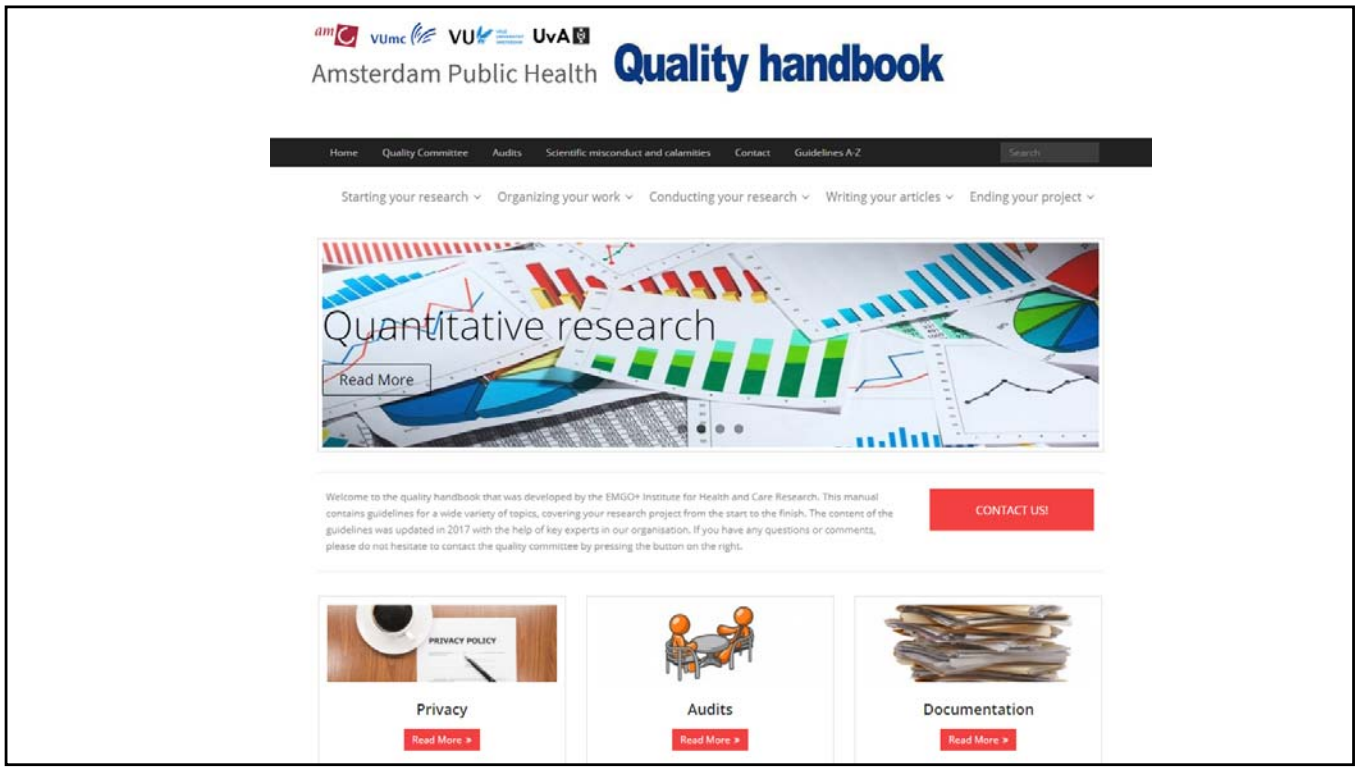
22

There seems to be no South African Code of Conduct for Research Integrity.

These two documents come the nearest I was told, but they concern mainly research ethics and publication ethics.

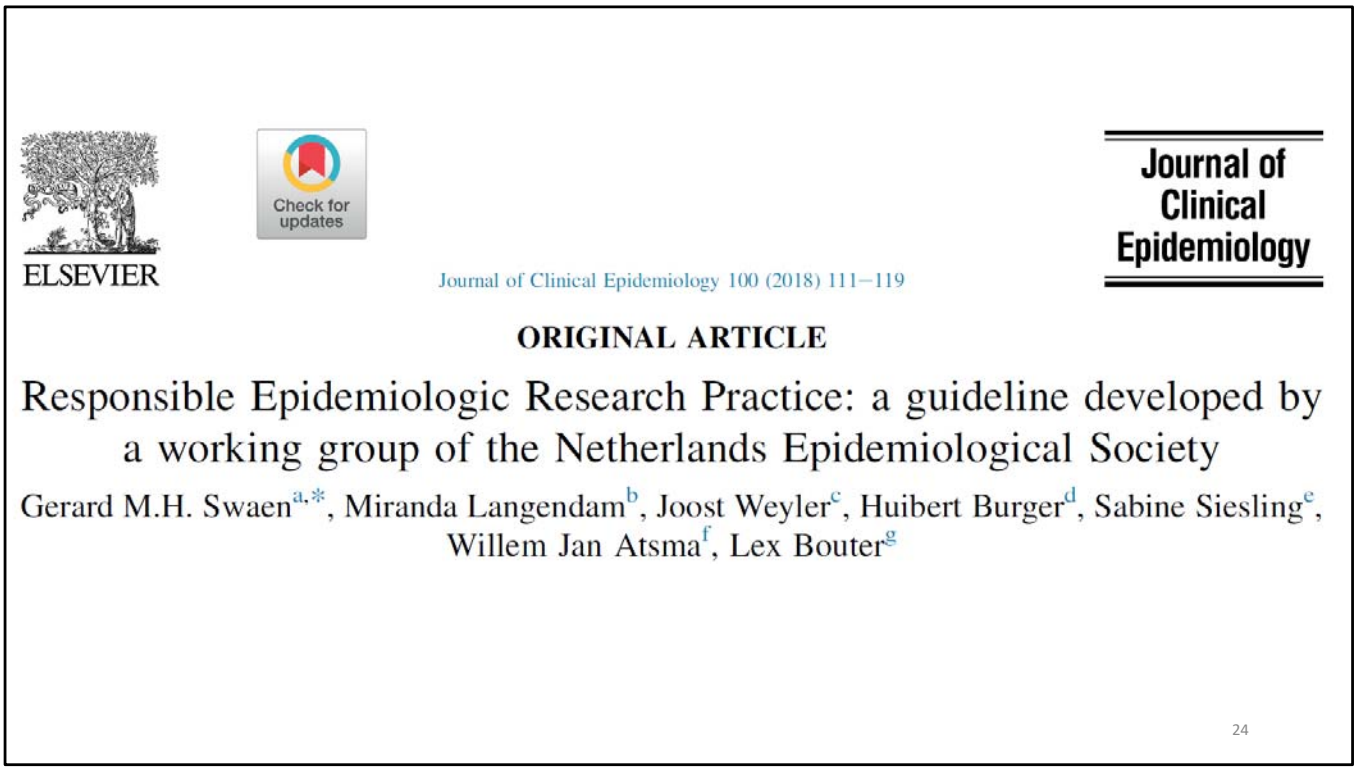
https://www.nrf.ac.za/sites/default/files/documents/STATEMENT%20ON%20ETHICAL.pdf

https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/coc_research-resource-poor-settings_en.pdf



http://www.emgo.nl/kc/

This is the most practical level of Standard Operating Procedures – typically available at the institutional or disciplinary level.



ELSEVIER

Check for updates

Journal of Clinical Epidemiology

Journal of Clinical Epidemiology 100 (2018) 111–119

ORIGINAL ARTICLE

Responsible Epidemiologic Research Practice: a guideline developed by a working group of the Netherlands Epidemiological Society

Gerard M.H. Swaen[a,*], Miranda Langendam[b], Joost Weyler[c], Huibert Burger[d], Sabine Siesling[e], Willem Jan Atsma[f], Lex Bouter[g]

24

This guideline is endorsed by the Netherlands Epidemiological Society and covers next to epidemiological studies also clinical studies.

Two members of the working group came from the Amsterdam UMC

2. Have fair procedures for handling allegations

That protect both the whistleblowers and the scientists they accuse

ACCOUNTABILITY IN RESEARCH
2017, VOL. 24, NO. 6, 359–366
https://doi.org/10.1080/08989621.2017.1327814

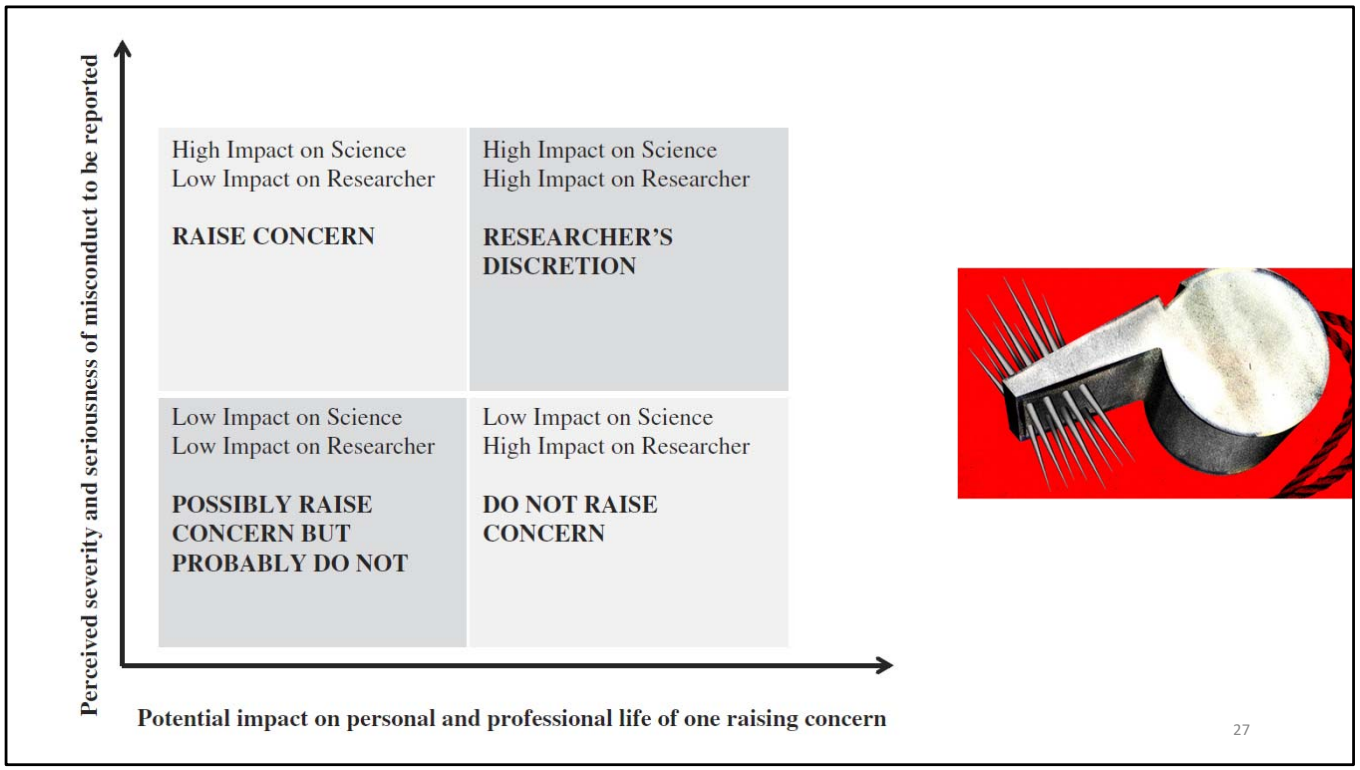
COMMENTARY

Both Whistleblowers and the Scientists They Accuse Are Vulnerable and Deserve Protection

Lex M. Bouter, Ph.D.[a,b] and Sven Hendrix, M.D., Ph.D.[c]

25

share.america.gov - *(State Dept. / Doug Thompson)*



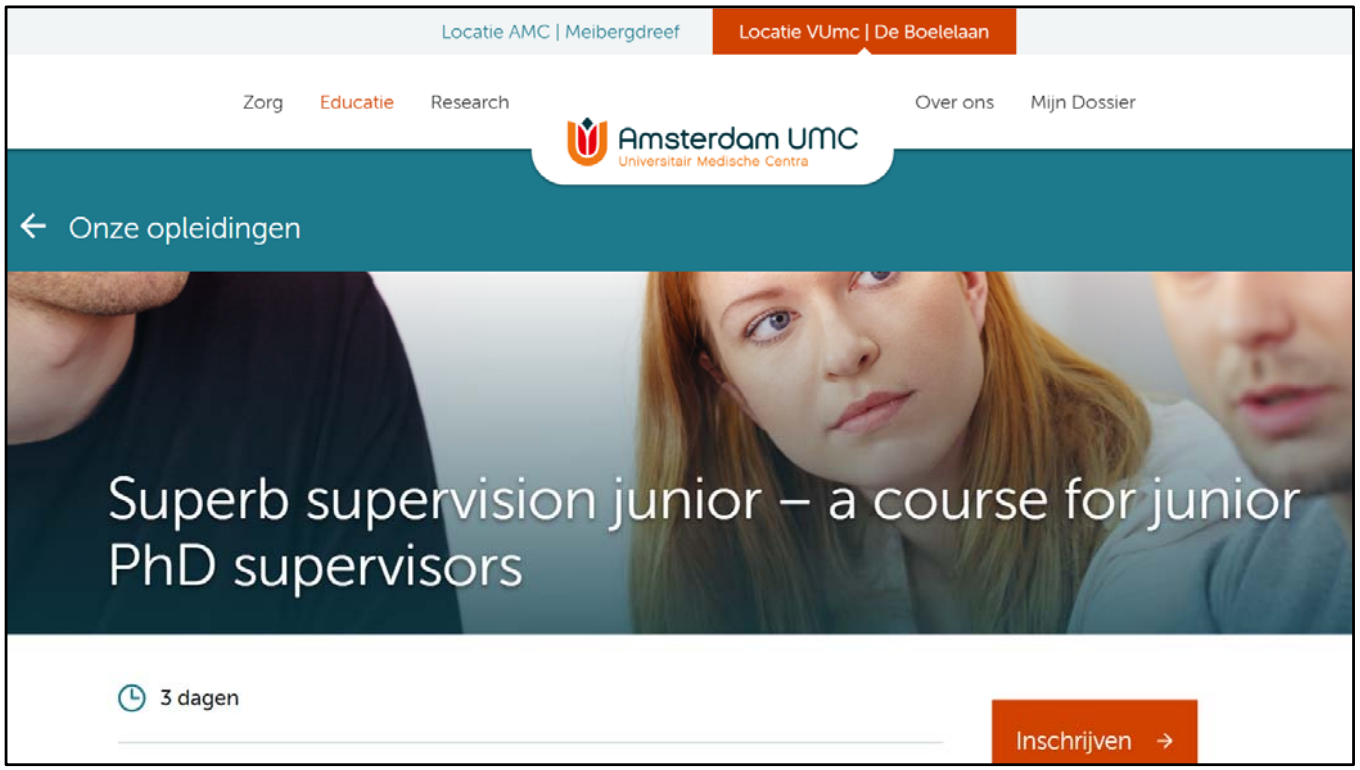
Satalkar et al- Is failure to raise concerns a breach of RI - Accountability in Research 2018; 25 311-39

3. Provide adequate mentoring and training in RCR

Which is likely to be important not only for PhD students

- PhD and postdoc RI courses are common
- No '***Licence to Supervise***'
- Insufficient mentoring is QRP #1
- Good role models are important
- Integration of mentoring skills + RI skills

28



https://www.vumc.nl/educatie/onze-opleidingen/opleidingsdetail/superb-supervision-junior-a-course-for-junior-phd-supervisors.htm

4. Provide methodological and statistical support

Because many QRPs have to do with poor methods

5. Have a system of internal audits

Which is is so often ignored in academia

6. Have good facilities for data-management and storage

Using web-based solutions for being transparant and accountable

30

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

7. Remove the perverse incentives in the reward system

And do not only count publications and citations

The Leiden Manifesto for research metrics

San Francisco DORA Declaration on Research Assessment

32

During recent years the simplistic and isolated use of quantitative bibliometric indicators (e.g. Impact Factor and H-index) to evaluate research and researchers has been strongly criticized.

The Hong Kong Principles aim at restoring the balance in the assesment for researchers by rely much less on bibliometric indicators and by taking into account open science modalities that strenghten research integrity.

https://re.ukri.org/sector-guidance/publications/metric-tide/

http://www.leidenmanifesto.org/

https://sfdora.org/read/

Rationale

We should award responsible research practices and avoid perverse incentives when assessing researchers, by not relying on simplistic metrics and by rewarding open science modalities.

33

THE HONG KONG PRINCIPLES
FOR ASSESSING RESEARCHERS

FOSTERING RESEARCH INTEGRITY

What are the HKP?

The Hong Kong Principles (HKP) were developed as part of the 6th World Conference on Research Integrity. They were developed to reinforce the need to ensure that researchers are rewarded for specific behaviors that promote trustworthy research.

34

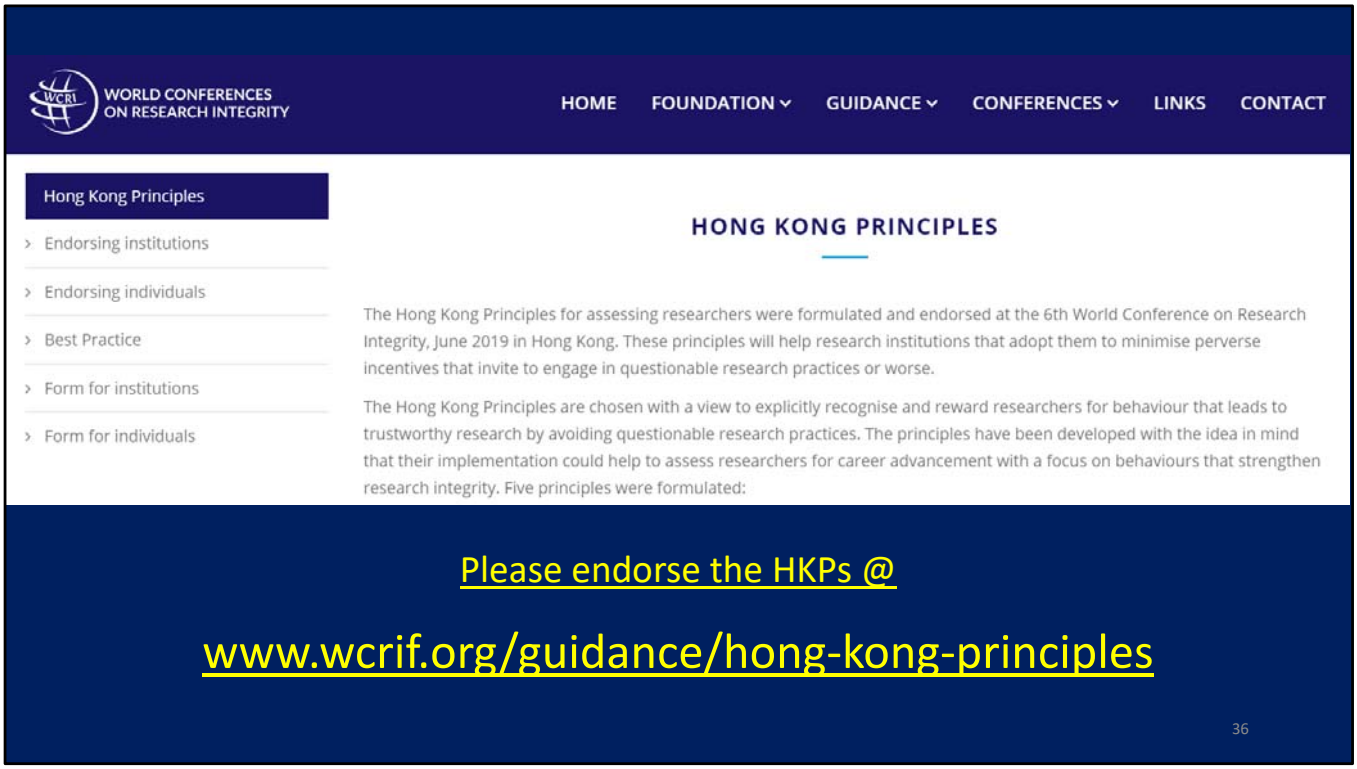
Moher D, Bouter L, Kleinert S, Glasziou P, Sham MH, Barbour V, Coriat AM, Foeger N, Dirnagl U. The Hong Kong principles for assessing researchers: fostering research integrity. OSF Preprints 2019 (September 17). (https://osf.io/m9abx)

Hong Kong Principles

1. Assess responsible research practices
2. Value complete reporting
3. Reward the practice of open science
4. Acknowledge a broad range of research activities
5. Recognize other tasks like peer review and mentoring

35

Moher D, Bouter L, Kleinert S, Glasziou P, Sham MH, Barbour V, Coriat AM, Foeger N, Dirnagl U. The Hong Kong principles for assessing researchers: fostering research integrity. OSF Preprints 2019 (September 17). (https://osf.io/m9abx)


WORLD CONFERENCES ON RESEARCH INTEGRITY
HOME
FOUNDATION
GUIDANCE
CONFERENCES
LINKS
CONTACT
Hong Kong Principles
Endorsing institutions
Endorsing individuals
Best Practice
Form for institutions
Form for individuals
HONG KONG PRINCIPLES
The Hong Kong Principles for assessing researchers were formulated and endorsed at the 6th World Conference on Research Integrity, June 2019 in Hong Kong. These principles will help research institutions that adopt them to minimise perverse incentives that invite to engage in questionable research practices or worse.
The Hong Kong Principles are chosen with a view to explicitly recognise and reward researchers for behaviour that leads to trustworthy research by avoiding questionable research practices. The principles have been developed with the idea in mind that their implementation could help to assess researchers for career advancement with a focus on behaviours that strengthen research integrity. Five principles were formulated:
Please endorse the HKPs @
www.wcrif.org/guidance/hong-kong-principles
36

8. promote an open research climate

With open discussion of dilemmas and learning from mistakes

37

https://wellcome.ac.uk/sites/default/files/what-researchers-think-about-the-culture-they-work-in.pdf

Haven TL, Tijdink JK, Martinson BC, Bouter LM. Perceptions of research integrity climate differ between academic ranks and disciplinary fields: results from a survey among academic researchers in Amsterdam. PLoS ONE 2019; 14: e0210599 (https://doi.org/10.1371/journal.pone.0210599).

See also:
http://www.amsterdamresearchclimate.nl/

Research Integrity Climate

- **junior researchers** perceive the research integrity climate **more negatively** than senior researchers
- **junior researchers** note that their **supervisors are too little committed** to talk about key research integrity principles
- **PhD students** perceive **more competition and suspicion** among colleagues than associate and full professors
- researchers from the **natural sciences** have a **more positive perception** of the research integrity climate
- Researchers from **social sciences** as well as from the **humanities** perceive **less fairness** of their departments' expectations in terms of **publishing** and **acquiring funding**

39

Haven TL, Tijdink JK, Martinson BC, Bouter LM. Perceptions of research integrity climate differ between academic ranks and disciplinary fields: results from a survey among academic researchers in Amsterdam. PLoS ONE 2019; 14: e0210599 (https://doi.org/10.1371/journal.pone.0210599).

See also:
http://www.amsterdamresearchclimate.nl/

Perceived Publication Pressure

- Publication pressure is a particularly **detrimental stressor** for **postdocs** and **assistant professors**
- Publication pressure concerns researchers from all disciplinary fields but is **highest for researchers in the humanities**
- Our findings emphasize the need to move the debate forward towards a healthy **publication climate**, where researchers are **incentivised** to **optimize quality and integrity** of their publications

40

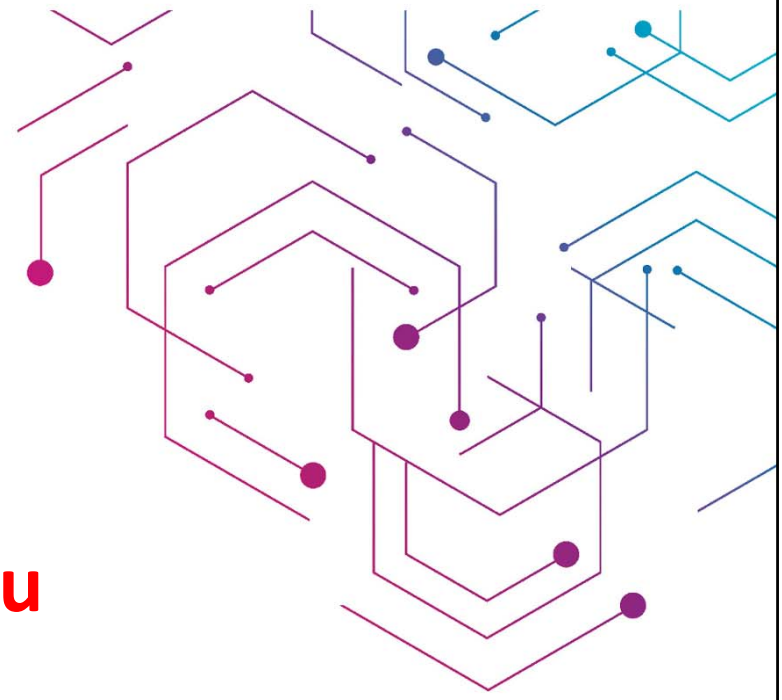
Haven TL, Bouter LM, Smulders YM, Tijdink JK. Perceived publication pressure in Amsterdam: survey of all disciplinary fields and academic ranks. PLoS ONE 2019; 14: e0217931. (https://doi.org/10.1371/journal.pone.0217931)

See also:
http://www.amsterdamresearchclimate.nl/

Welcome to SOPs4RI

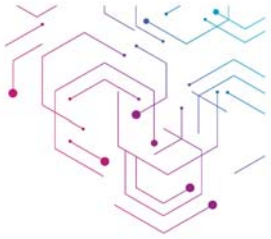
Promoting excellent research and a strong research integrity culture that aligns with the European Code of Conduct for Research Integrity.

READ MORE ›



www.sops4ri.eu

Research Integrity Promotion Plan



- Explains what the RPO does - in the context of its **mission**, **disciplinary focus** and **type of research** it performs - to promote RI
- Covers a set of **mandatory** topics and **optional** sub-topics
- Consists of a **mix** of education programs, codes, manuals, policy measures, regulations, facilities, audit schemes, and support systems
- Preferably uses SOPs and guidelines from the **toolbox**

42

Having a RIPP is not enough. It needs to be fully implemented and it should be monitored when indeed all elements of the RIPP are effectively brought to practice..


WCRI
WORLD CONFERENCES
ON RESEARCH INTEGRITY
www.wcrif.org

www.wcri2021.org