VU VRIJE UNIVERSITEIT AMSTERDAM

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# Importance of Research Integrity

*Lex Bouter*

# Content

- Research Integrity
- Replicability crisis
- Plea for transparency
- What can we do?


Yoshitaka Fujii - World record holder
N=183

# Top of the ice berg

1. Not all research misconduct will be detected

2. On the aggregate level sloppy science may be a much larger problem

# Spectrum of research practices

How it should be done:

**Relevant, Valid, Efficient**

Sloppy science:

*Ignorance, honest error or dubious integrity*

Scientific fraud:

**Fabrication, Falsification, Plagiarism**

# How often do RM and QRP occur?

average of 21 surveys

- Self-reported **FF** at least once in last 3 yrs → **2%**
- Self-reported **QRP** at least once in last 3 yrs → **34%**

# Top 5 – Frequency

| rank | item | score |
|---|---|---|
| 1 | Selectively cite to enhance your own findings or convictions | 3.5 |
| 2 | Insufficiently supervise or mentor junior coworkers | 3.5 |
| 3 | Not publish a valid 'negative' study | 3.4 |
| 4 | Demand or accept an authorship for which one does not qualify | 3.3 |
| 5 | Selectively cite to please editors, reviewers or colleagues | 3.3 |

# Top 5 – Impact on Truth

| rank | item | score |
|---|---|---|
| 1 | Fabricate data | 4.6 |
| 2 | Selectively delete data, modify data or add fabricated data after performing initial data-analyses | 4.4 |
| 3 | Modify the results or conclusions of a study due to pressure of a sponsor | 4.4 |
| 4 | Choose a clearly inadequate research design or using evidently unsuitable measurement instruments | 4.2 |
| 5 | Conceal results that contradict your earlier findings or | 4.0 |

# Top 5 – Frequency X Truth

| rank | item | score |
|---|---|---|
| 1 | Insufficiently supervise or mentor junior coworkers | 12.6 |
| 2 | Insufficiently report study flaws and limitations | 12.3 |
| 3 | Keep inadequate notes of the research process | 12,2 |
| 4 | Turn a blind eye to putative breaches of research integrity by others | 12,1 |
| 5 | Ignore basic principles of quality assurance | 12,0 |

# Fabrication and Falsification

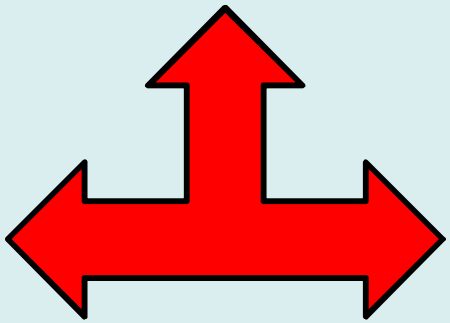
*Rank numbers*

| item | freq | truth | freq x truth |
|---|---|---|---|
| Delete data before performing data analysis without disclosure | *45* | *6* | *19* |
| Selectively delete data, modify data or add fabricated data after performing initial data-analyses | *50* | *2* | *24* |
| Fabricate data | *59* | *1* | *34* |

# Determinants Research Misbehaviour

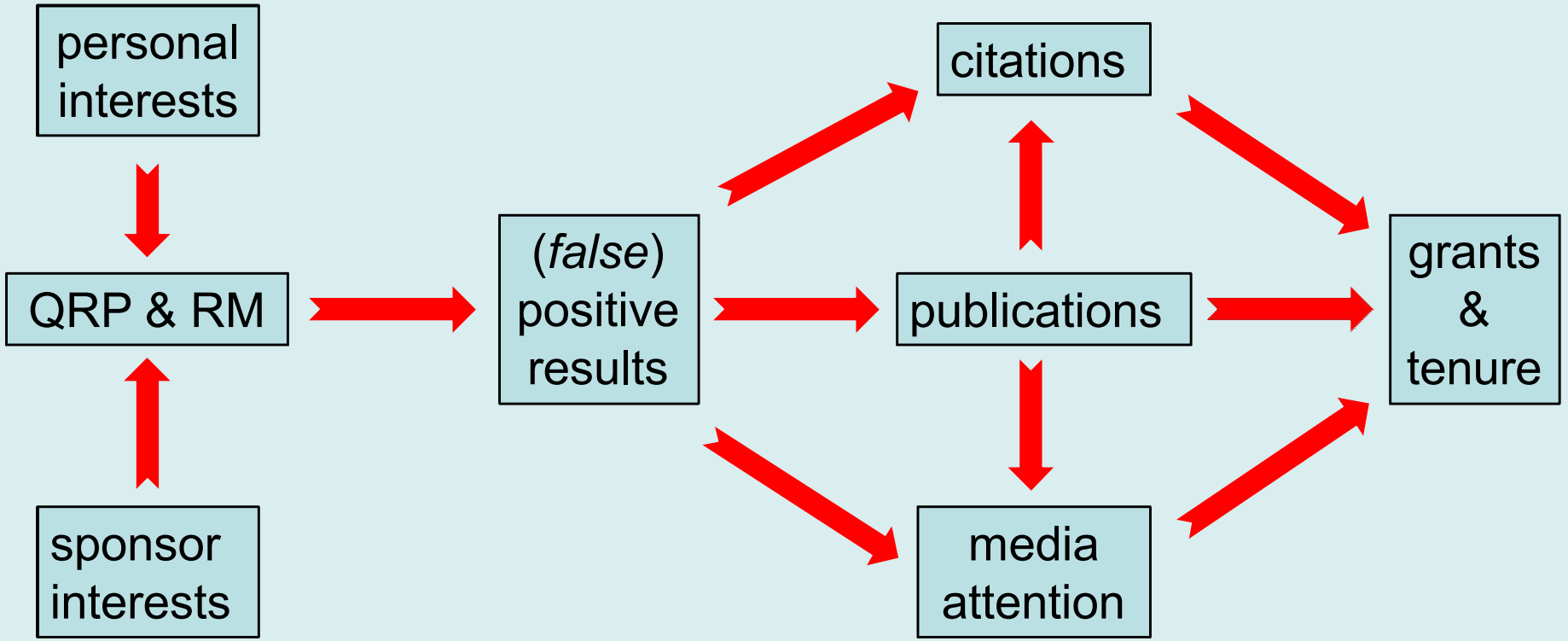
**SYSTEM**
*publication pressure*
*hyper competition*
*low risk – high rewards*

**CULTURE**
*wrong role models*
*insufficient mentoring*
*no RCR education*
*no clear guidance*



**INDIVIDUAL**
*justifying misbehavior*
*conflicts of interest*
*moral attitudes*
*personality traits*

# How things can go wrong



Non-publication → **publication bias**

Selective reporting → (outcome) **reporting bias**

- Both favour preferred ('positive') findings
- Leading to a distorted picture in the published body of evidence
- Leading to **Flawed Systematic Reviews** and **Low Replication Rates**
- Leading to substantial **Research Waste**

# Raise standards for preclinical cancer research

C. Glenn Begley and Lee M. Ellis propose how methods, publications and incentives must change if patients are to benefit.

## Only 6 of 53 preclinical landmark cancer studies could be confirmed by replication

When negative studies are rarely published,
published positive studies are likely to be chance findings

**Non-confirmed studies**

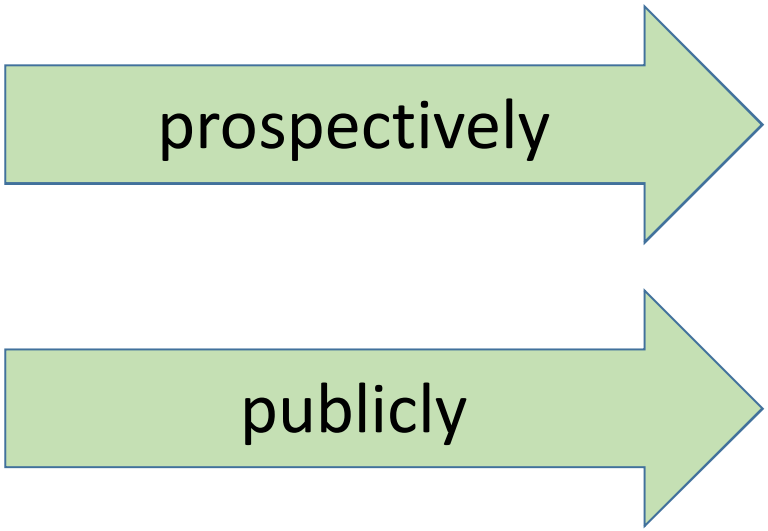
- sometimes inspire many new studies → **waste of resources**!
- sometimes lead to clinical trials → **unethical situation**!

# Considerations about Replication

- Lack of replicability is **NOT** a strong indication of **fraud**
- Many alternative explanations like **chance** and **honest error**
- Lack of replication is most likely due to **selective reporting**
- Attempt to replicate means the original study is **important**
- **Redundant replication** may be a problem as well


sincerity
fairness
clarity
openness
transparency
honesty
truth
believability

# Transparency of




**Study Protocol**
**Log of Data Collection**
**Analysis Plan**
**Syntaxes**
**Conflicts of Interest**
**Amendments**
**Data Sets → Open Data**
**Reports → Open Access**

# Conditions for transparency

- adequate **skills**, **systems** and **facilities**
- some months of **embargo**
- proper **acknowledgements**
- opportunity to participate
- guarantees against breaches of **privacy** and **misuse**
- predefined study **protocol** for re-use of data

# 10 Commentaries
# Journal of Clinical Epidemiology
# February Issue 2016

ELSEVIER

CrossMark

Journal of Clinical Epidemiology

Journal of Clinical Epidemiology 70 (2016) 1–3

**EDITORIAL**

Promoting transparency of research and data needs much more attention

# How can we promote transparency?

→ ***re-design reward system***

- No exclusive focus on **citations** and **high IF** journals
- Reward publication of **protocols** and **'negative' results**
- And reward **data sharing** and **replication**
- As well as **dissemination** and **application** of findings

San Francisco DORA
Declaration on Research Assessment

# The Leiden Manifesto for research metrics

**Nature 2015; 520: 429-31**

REDEFINE EXCELLENCE

# Fix incentives to fix science

*Rinze Benedictus and Frank Miedema*

**Nature 2016; 538: 453-5**

# How can we promote transparency?

→ ***by nudging and forcing***

- Permission to conduct study → **(review) boards**
- Condition for (last) payment → **funders**
- Eligibility for next grant application → **funders**
- Condition for publication → **journals**

# What can our institutions do?

- Being clear about what is expected – **values and norms**
- Having adequate procedures for handling **allegations**
- Remove perverse incentives in **reward system**
- Offer good **RCR education** for staff and students
- Promote open discussion about **dilemmas** scientist face

# Conclusions

- **Sloppy science** is a larger evil than research misconduct
- Especially **selective reporting** threatens validity and efficiency
- Leading to a **replication crisis**
- More **transparency** is urgently needed
- For that we need to re-design the **reward system**
- And let multiple **stakeholders** take action

# Website: www.nrin.nl

# 5th World Conference on Research Integrity


www.wcri2017.org

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