Amsterdam UMC
University Medical Centers

VU VRIJE UNIVERSITEIT AMSTERDAM

## Summer Seminar on Research Integrity

# Introduction and Overview

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Research Integrity
Research Ethics
Responsible Research & Innovation

**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**.

# Spectrum of research practices

How it should be done:

**Relevant, Valid, Reproducible, Efficient**

Sloppy science:

*Ignorance, honest error or dubious integrity*

Scientific fraud:

**Fabrication, Falsification, Plagiarism**

# National Survey on **Research Integrity**

**www.nsri2020.nl**

@SurveyIntegrity

| Five most prevalent QRPs (score 5,6,7) | Prevalence (%) |
|---|---|
| Insufficient inclusion of **study flaws and limitations** in publications | **15.1** |
| **Selectively citing** references to enhance findings | **13.3** |
| Insufficient **attention to equipment, skills or expertise** | **12.9** |
| Inadequate recording of the **research process** | **12.8** |
| Insufficient **supervision or mentoring** of juniors | **12.6** |

| Prevalence: QRP/FF | Prevalence (%) |
|---|---|
| **Any Frequent QRP**<br>(at least 1/11 QRPs with a score of 5,6,7) | 51.3 |
| **Fabrication**<br>(making up data or results) | 4.3 |
| **Falsification**<br>(manipulating research materials, data or results) | 4.2 |
| **Any FF**<br>(either fabrication or falsification or both) | 8.3 |

| Five most prevalant RRPs (score 5,6,7) | Prevalence (%) |
|---|---|
| **Accurately citing** the source in publications | 95.6 |
| **Meticulously checking work** to avoid errors and biases before releasing results | 90.2 |
| **Disclosure** of who funded studies and relevant financial and non-financial interests | 84 |
| Managed **research data carefully** | 78.6 |
| **Allocation and ordering of authorships** fair and in line with the standards of one's discipline | 76.2 |

| Open Science RRPs | Prevalence (%) |
| --- | --- |
| Making data findable, interoperable, accessible according to FAIR principles | 65.1 |
| Publishing open access | 64.9 |
| Disclosing underlying data, computer codes, or syntaxes used | 34.2 |
| Pre-registration of study protocols | 26.2 |

What is good for the ***truth*** of and the ***trust*** in research is not always good for your academic career

# Functioning of moral compass depends on:

- Virtuousness of the individual
- Research climate in the lab
- Adequate incentives

# Explanatory factors associated with QRPs and FF

| Explanatory factors scales | Overall QRP mean | Any frequent QRP | Any FF |
|---|---|---|---|
| | Linear regression (95% CI) | Logistic regression OR (95% CI) | Ordinal regression OR (95% CI) |
| Publication pressure | 0.10 (0.08, 0.12) | 1.22 (1.14, 1.30) | |
| Scientific norm | -0.12 (-0.13, -0.10) | 0.88 (0.83, 0.94) | 0.79 (0.63, 1.00) |
| Likelihood of detection (reviewers) | | | 0.62 (0.44,0.88) |

# Explanatory factors associated with RRPs

| Explanatory factor scales | Overall RRP Mean<br>Linear regression<br>(95 % CI) |
|---|---|
| Publication pressure | -0.05 (-0.08, -0.02) |
| Mentoring | 0.15 (0.12, 0.17) |


# Research integrity: nine ways to move from talk to walk

Open Access

**Nature 2020; 586: 358-60**

| Area | Topic | Action* |
|---|---|---|
| Support | Research environment | Ensure fair assessment procedures and prevent hypercompetition and excessive publication pressure. |
| | Supervision and mentoring | Create clear guidelines for PhD supervision (such as on meeting frequency); set up skills training and mentoring. |
| | Integrity training | Establish training and confidential counselling for all researchers. |
| Organization | Ethics structures | Establish review procedures that accommodate different types of research and disciplines. |
| | Integrity breaches | Formalize procedures that protect both whistle-blowers and those accused of misconduct. |
| | Data practices and management | Provide training, incentives and infrastructure to curate and share data according to FAIR principles. |
| Communication | Research collaboration | Establish sound rules for transparent working with industry and international partners. |
| | Declaration of interests | State conflicts (financial and personal) in research, review and other professional activities. |
| | Publication and communication | Respect guidelines for authorship and ensure openness and clarity in public engagement. |

# EXTERNAL EXPECTATIONS

# INTERNAL PROCEDURES

SOPs4RI

COMPLIANCE with RI

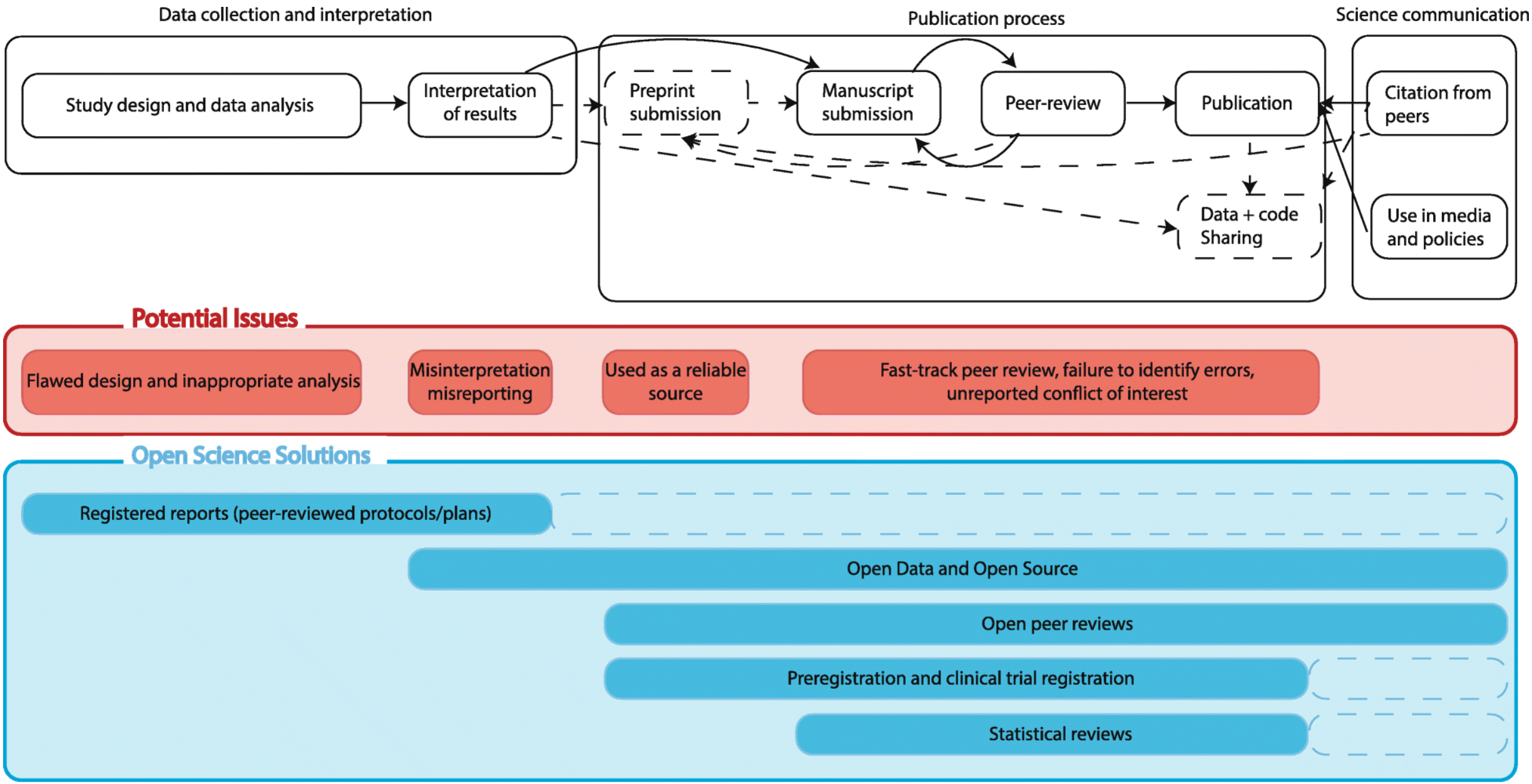
GRANT ASSESSMENT

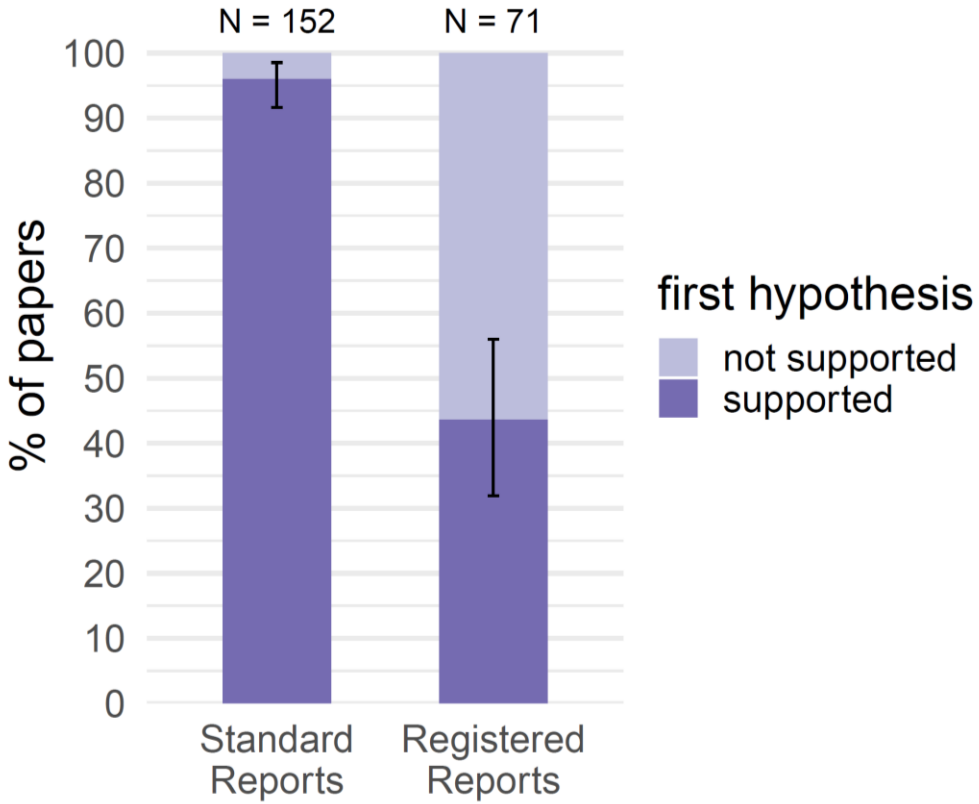
MONITORING GRANTS

EXPECTATIONS for RPOs

DECLARATION of CONFLICTS

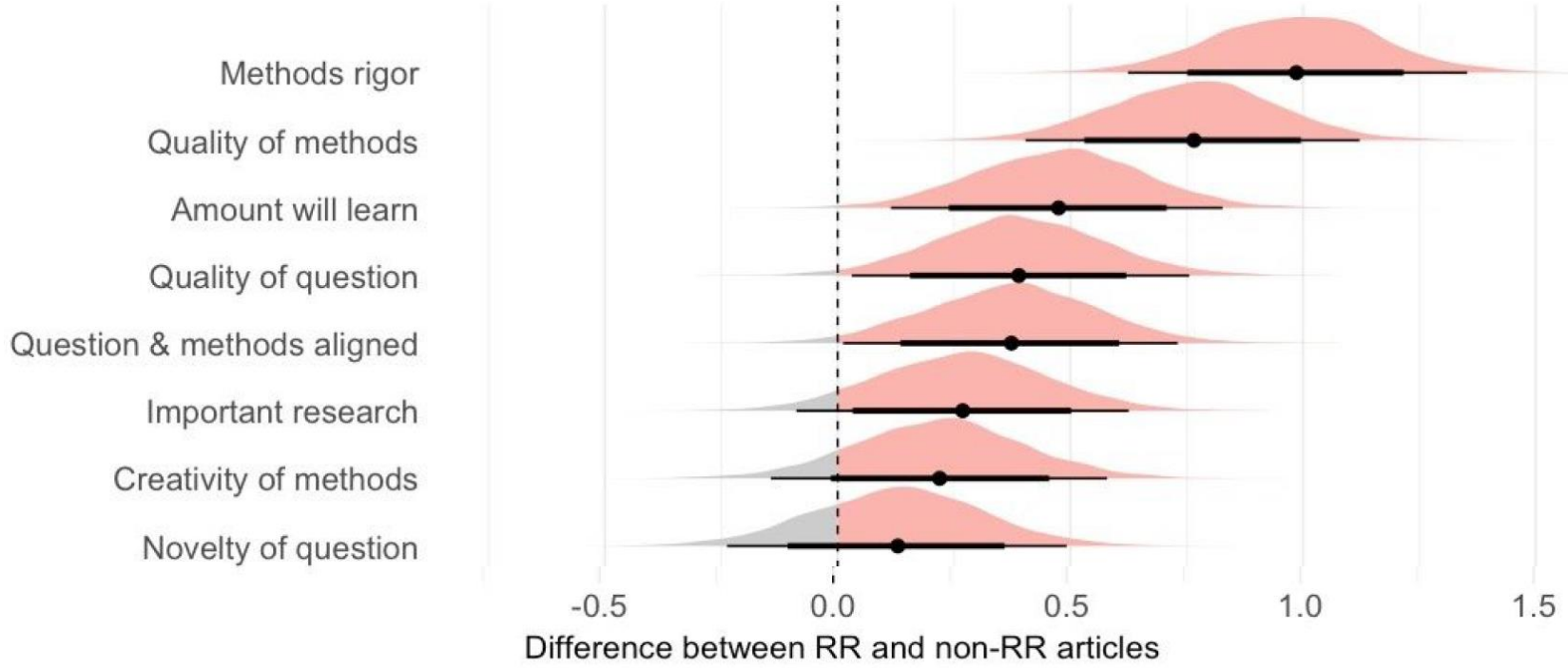
INTERNAL BREACHES of RI


Data collection and interpretation
Publication process
Science communication
Study design and data analysis
Interpretation of results
Preprint submission
Manuscript submission
Peer-review
Publication
Citation from peers
Data + code Sharing
Use in media and policies
Potential Issues
Flawed design and inappropriate analysis
Misinterpretation misreporting
Used as a reliable source
Fast-track peer review, failure to identify errors, unreported conflict of interest
Open Science Solutions
Registered reports (peer-reviewed protocols/plans)
Open Data and Open Source
Open peer reviews
Preregistration and clinical trial registration
Statistical reviews





**Adopted by about 300 journals !**



# Features of the Summer Course

- Multidiscplinary – Multistakeholder
- Reflection – Empirical evidence – Action-oriented
- Interactive – room for debate
- Work in progress
- Pitches of ongoing projects from participants