

# Is Open Science the panacea for responsible research practices?



Joeri Tijdink

Ass. Professor and psychiatrist, VU and AmsterdamUMC (VUmc)

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# Open Science: the case for it

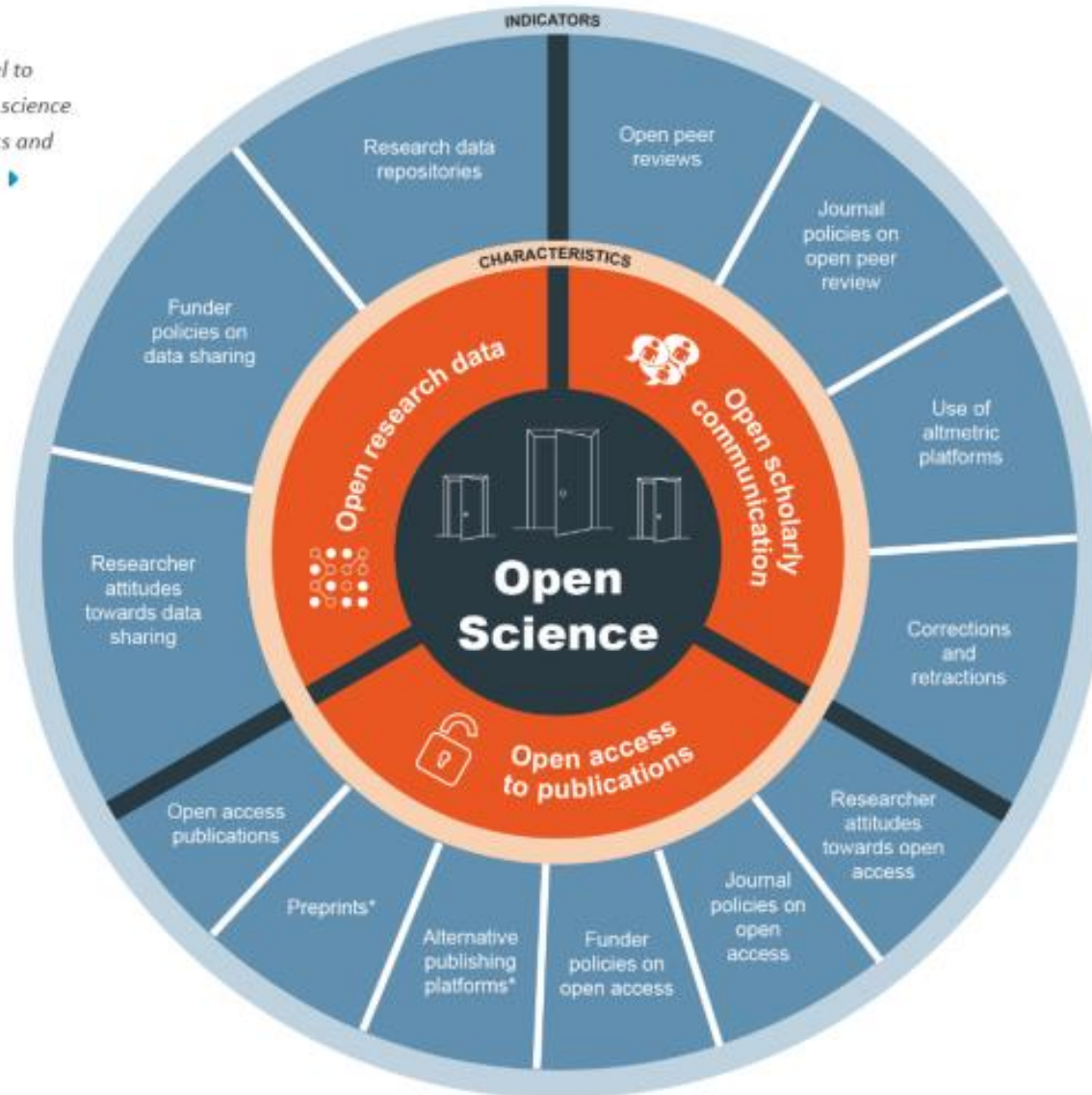
- Research transparency is advanced when scientific claims are independently verifiable
- Resonates with the “scientific ethos” i.e Merton 1942

# Open Science: Four core values (Merton 1942)

1. Universalism: Research findings are fundamentally “impersonal”
2. Communalism: Open sharing of scientific knowledge
3. Disinterestedness: Identify the truth rather than (selfish) professional or monetary motivations
4. Organized skepticism: Verify and scrutinize claims for research credibility and progress.

# What is Open Science exactly?

Use the wheel to explore open science characteristics and indicators. ▶▶



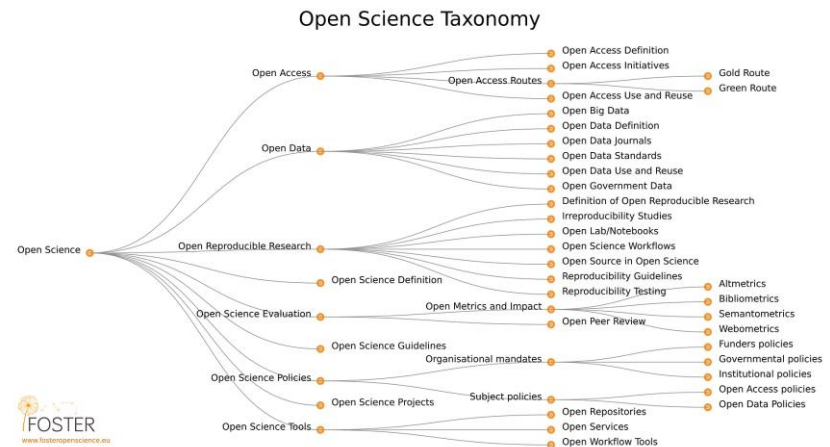
European Union Open Science monitor

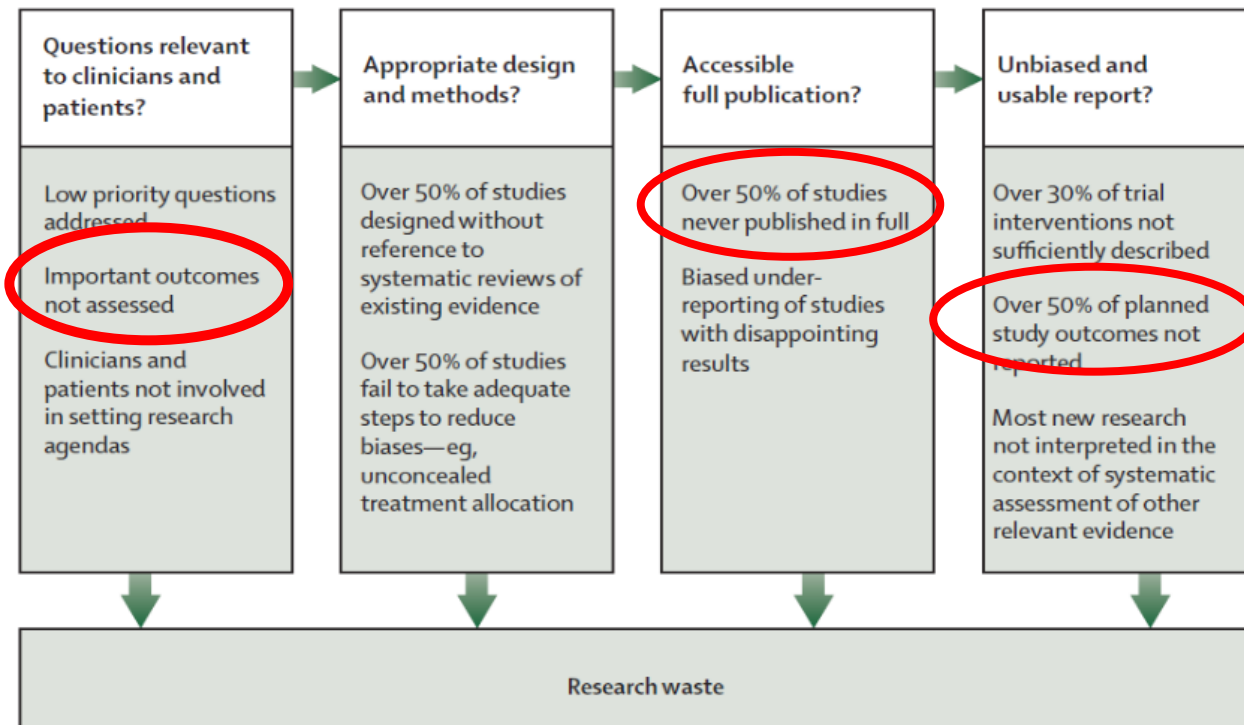
# Open science is the future

- Open Science

- Open data
- Open review
- Open access
  - Preprints
- Open assessment
- Open Research methods

- Scientific rigour should be transparent and open to properly assess it by others
- Scientific knowledge has no real ownership
- Responsibility to society





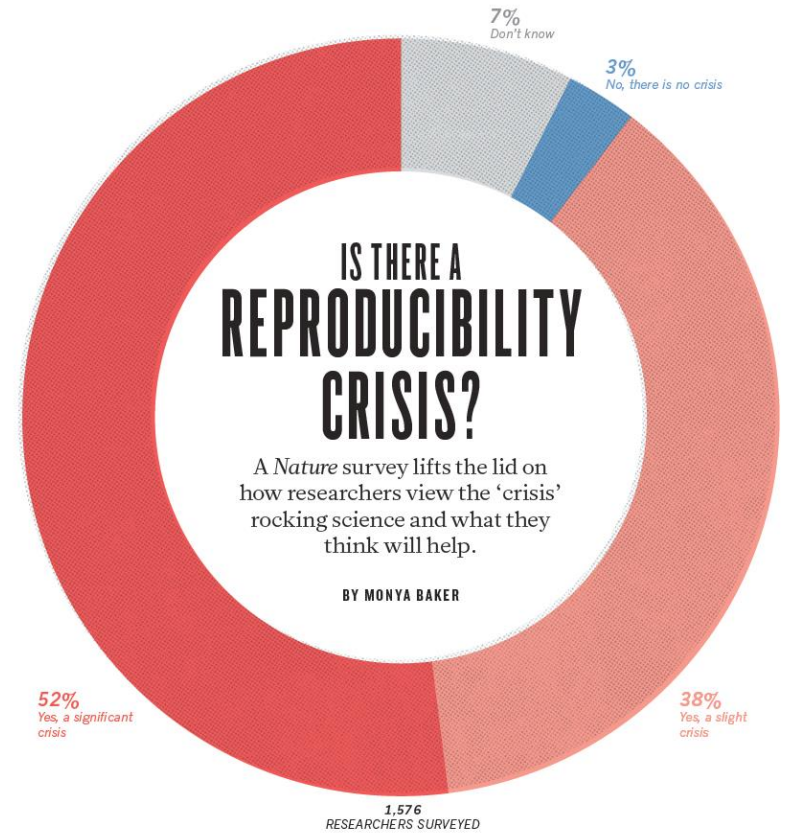
Outcome reporting bias (HARKing), publication bias, selection bias, lack of reproducibility, p-hacking, etc

**Avoidable waste may be up to 85%!**



# FOOLING OURSELVES

HUMANS ARE REMARKABLY GOOD AT SELF-DECEPTION.  
 BUT GROWING CONCERN ABOUT REPRODUCIBILITY IS DRIVING MANY  
 RESEARCHERS TO SEEK WAYS TO FIGHT THEIR OWN WORST INSTINCTS.



# Is the COVID-19 pandemic showing us the value of Open Science?

Two important themes in Covid 19



**Open  
science**

**Speed  
science**



# Speedscience – the Hydroxychloroquine-case

- Didier Raoult – French professor in infectious disease
  - Rebel or genius?
  - Eccentric...
- Preprint severely criticized?
- Not reliable because:
  - Small N (24 & 80 included patients)
  - No randomization
  - No control group
  - Young age (av. 44 )



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“a gift from heaven” – D. Trump

# Implications

- Less robust science pushed out quickly

>> “Wrong /sloppy science/ spin” amplified by social media

>> Guiding public health policy with immediate impact

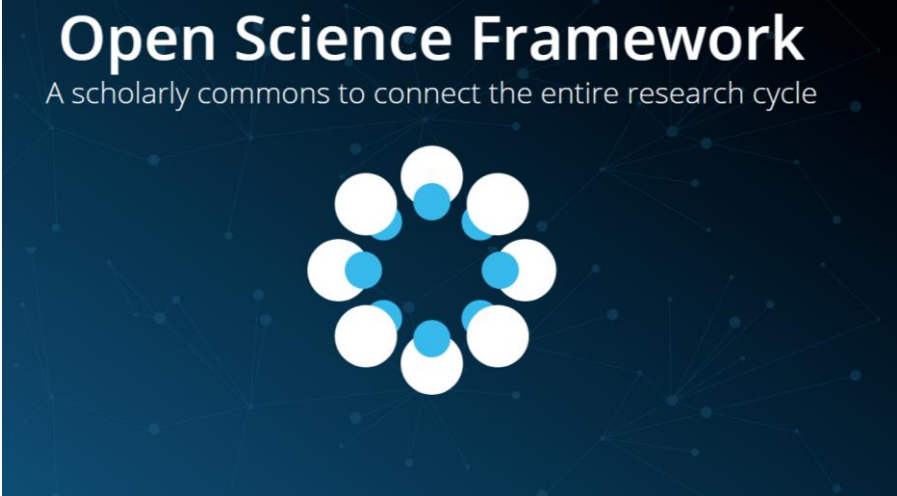
- Research wastage:

<https://www.bmj.com/content/369/bmj.m1847>

But.... a big chance for open science to prove itself

# The need for transparency

- Publish prospectively
  - Study protocol
  - preregistrations
  - Log of data collection
  - Analysis plan
  - Syntaxes
  - Conflicts of interest
- Publish
  - Data (open data)
  - Reports (open access)



 U.S. National Library of Medicine

*ClinicalTrials.gov*

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# 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

# What can you do?

1. Critical feedback loop in open science era

>> responsibility of all scientists

>> public peer review a self correcting mechanism vs sharing results fast

2. Science communicate is changing:

blog posts, twitter = “unofficial peer review playground”

3. Educating/awareness on pre-prints, preregistrations, replication, data sharing

4. “Red Teams” : critique science at every stage not just final stage

Nature 581, 121 (2020);

doi: 10.1038/d41586-020-01392-8

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“Researchers need to commit to addressing criticism from the outset.”

**Pandemic researchers recruit your best critics**

**nature**





[j.tijdink@amsterdamumc.nl](mailto:j.tijdink@amsterdamumc.nl)