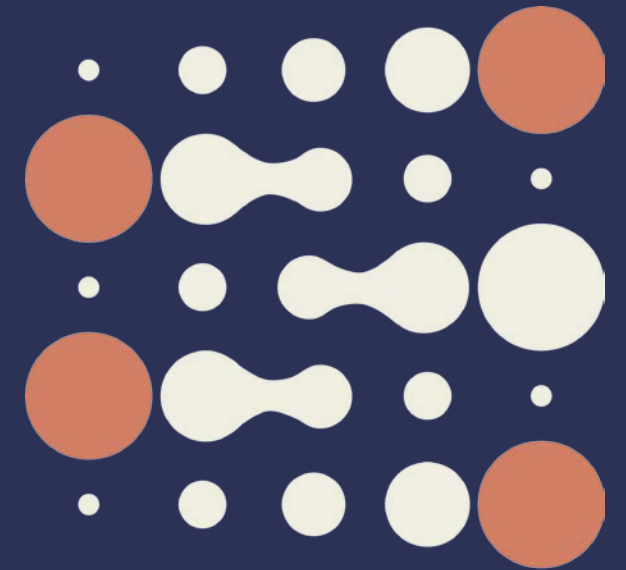


IARC's Vision for Open Science

Matthieu Foll, on Behalf of the
IARC Open Science Working Group

Scientific Council 60th session – SC/60/7
Lyon, 7–9 February 2024

International Agency
for Research on Cancer



Introduction

- **Open Science in the MTS**

Open Science is really part of IARC's strategy and it is a driving concept of the MTS 2021-2025, including:

- A new **data sharing** policy that will facilitate uses, reuse & sharing of IARC's research data.
- The concept of Open Access to scientific resources also applies to the **biobank**, thanks to an accessibility framework for IARC's collections of biological samples.
- The Nouveau Centre in Lyon Gerland Biodistrict also aims to provide a great environment for **scientific collaboration**, based on the concept of Open science. It will facilitate **interactions with citizens**.

Nouveau Centre – Open Science

The move of IARC to its new headquarters building, the Nouveau Centre – expected to occur in 2022 – will enable IARC to transition smoothly to a state-of-the-art, eco-friendly Agency, embracing and living the concept of Open Science. The smart building will provide an inspiring environment for scientific collaboration and for advancing global cancer research. Its physical structure will emphasize transparency and echo an Open Science concept.



IARC MTS 2021-2025

Open Access as a cornerstone of Open Science

IARC will increasingly engage in open research data sharing, aimed at facilitating and maximizing data reuse. A new data sharing policy will facilitate sharing IARC's research data widely, while protecting the interests of IARC, its Participating States, and partners as well as the rights of individuals, including ethical and legal considerations.

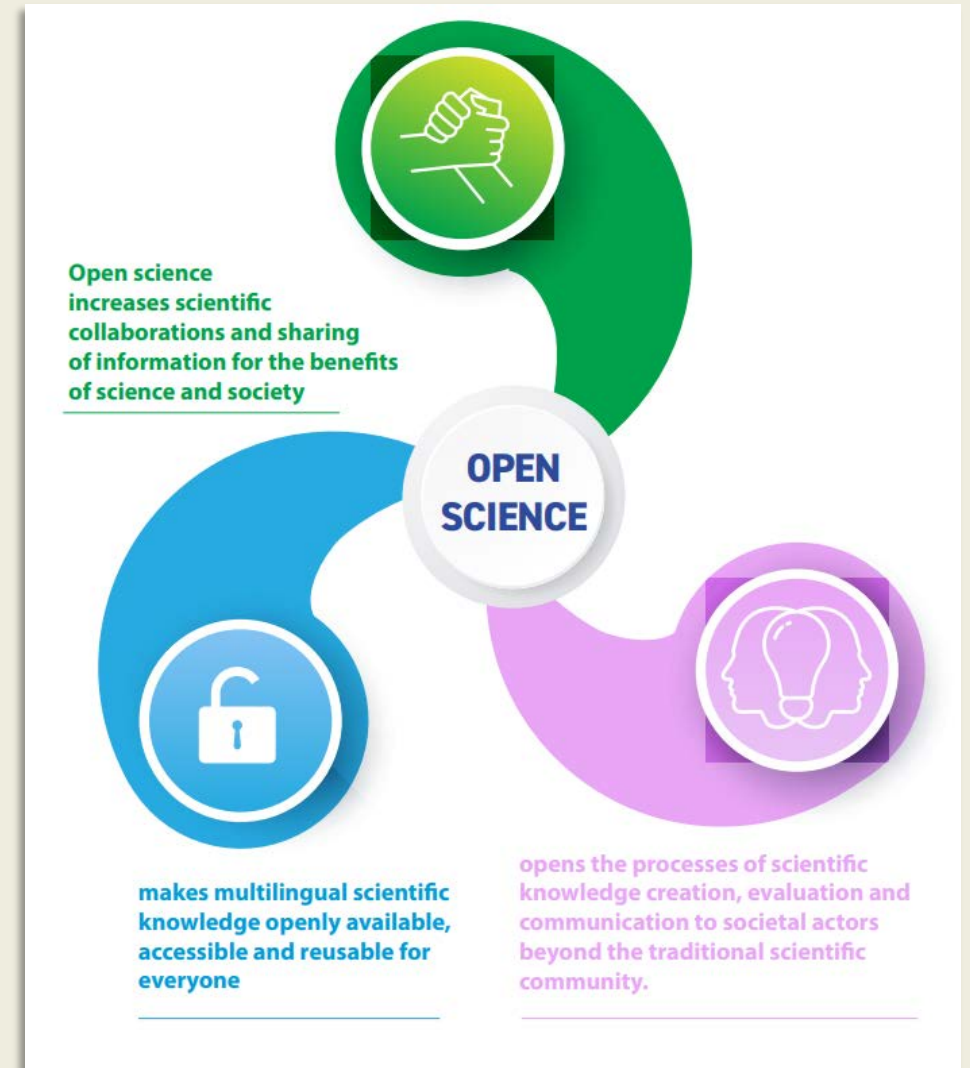
Precision research is based on the analysis of well-characterized, research-ready samples combined with data and/or on the biological validation of data-driven observations. The concept of Open Access to scientific resources will extend to IARC's biobank, i.e. its collections of biological samples under a transparent governance and accessibility framework. To ensure the sustainability of the biobank's operations, selected samples may be made available on a cost-recovery basis.

Introduction

- **UNESCO** recommendation on Open Science
- In 2021, UNESCO published recommendation on Open Science representing interesting guidelines for IARC and its MTS implementation

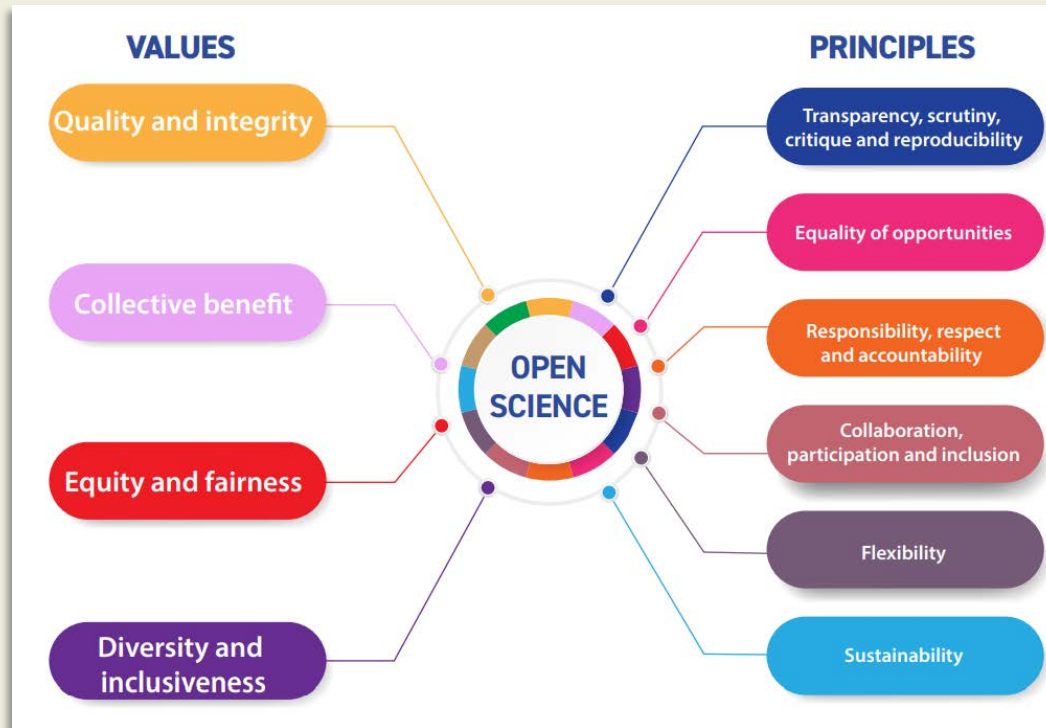


- “UNESCO considers that the global COVID-19 health crisis has proven worldwide the urgency of and need for fostering equitable access to scientific information, facilitating the sharing of scientific knowledge, data and information, enhancing scientific collaboration and science- and knowledge-based decision making to respond to global emergencies and increase the resilience of societies”



Introduction

- According to UNESCO Open Science relies on:
 - open scientific knowledge, open science infrastructures, open engagement of societal actors, open dialogue with other knowledge systems.
- For proper implementation, it requires:



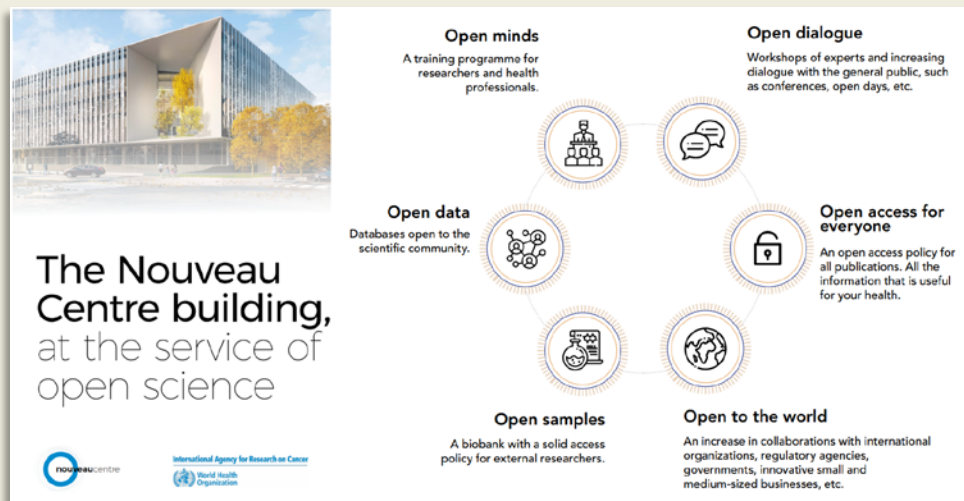
Open Access publications

Number and proportion of Open Access publications since 2016			
Year	Number and % of Open Access publications	Number and % of non-Open Access publications	Total number of publications
2016	133 (37%)	225 (63%)	358
2017	164 (43%)	217 (57%)	381
2018	142 (39%)	224 (61%)	366
2019	173 (44%)	218 (56%)	391
2020	219 (48%)	241 (52%)	460
2021	227 (54%)	192 (46%)	419
2022	223 (55%)	183 (45%)	406

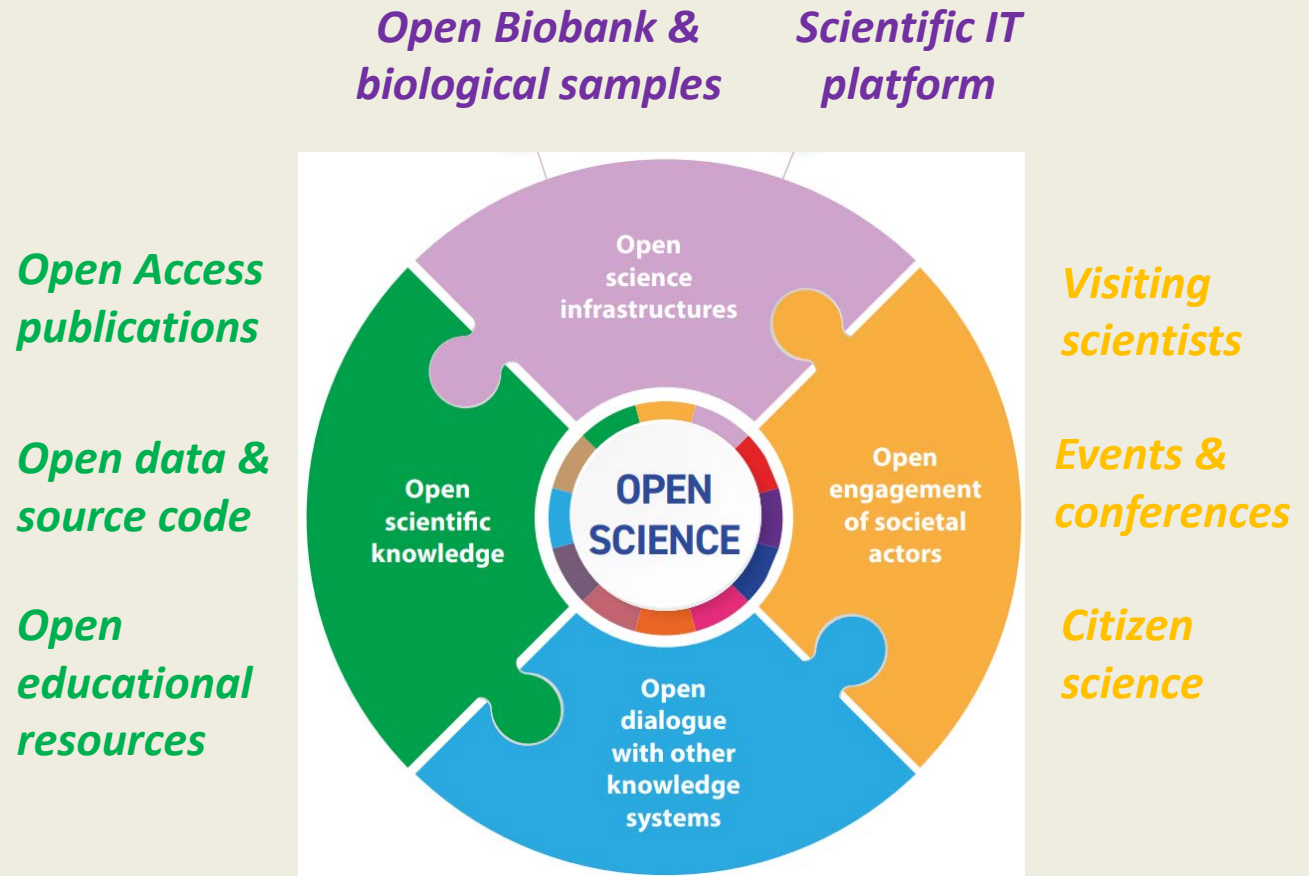
Source: IARC-SSR (PLW), September 2023

From Open Access to Open Science

- **2015:** IARC Open Access policy
- **2021:** IARC MTS 2021-2025
- **2023:** Open Science & the Nouveau Centre
- **2024:** Open Science Vision



Open Science within IARC



IARC Open Science Vision

- **Openness guiding principle but restrictions when required:**
“as open as possible, as closed as necessary”
- **Multifaceted:**
 - Open Research Data, FAIR principles
 - Biobank open research infrastructure
 - Open-source software and Source Code
 - Open access to Publications
 - Training and professional development of personnel
 - Open education
 - Citizen science
 - Research assessment and evaluation

IARC Open Science Vision

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- **Multidimensional:**
 - Cost
 - Intellectual Property Rights
 - Licensing
 - Accessibility
 - Equity, Diversity and Inclusion
 - Public Engagement

IARC Open Science Vision

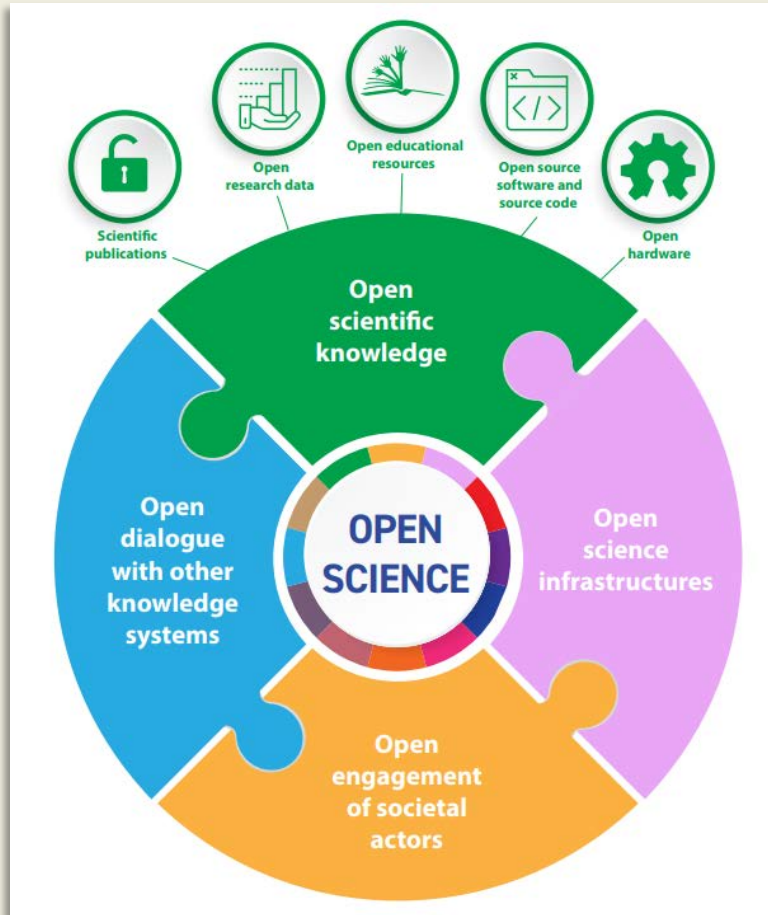
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 - Citizen science
 - Research assessment and evaluation
- **Multidimensional:**
 - Cost
 - Intellectual Property Rights
 - Licensing
 - Accessibility
 - Equity, Diversity and Inclusion
 - Public Engagement
- **Supported by a robust digital infrastructure**
- **Aligns with best-practices and standards**
- **Recognizing and rewarding Open Science research**

Thank you for your attention!

Questions?

Members of the working group: Anouk Berger, Olivier Exertier, Matthieu Foll, Heinz Freisling, Jolien Jongerius, Teresa Lee, Chiara Scoccianti, Zisis Kozlakidis

UNESCO guidelines



UNESCO

• According to UNESCO Open Science relies on:

- **Open scientific knowledge** which refers to open access to scientific publications, research data, metadata, open educational resources, software, and source code and hardware.
- **Open science infrastructures** which designate shared research facilities : including physical infrastructures such as open labs and open research equipment, but also virtual infrastructures such as open access publication platforms, digital research services...
- **Open engagement of societal actors** which means extended collaboration between scientists and societal actors beyond the scientific community, as well as new forms of collaboration such as crowdfunding, crowdsourcing and scientific volunteering
- **Open dialogue** with other knowledge systems implies dialogue between different knowledge holders, including marginalized scholars, local communities...

Open Access publications

Open access context at IARC

2014

[WHO Policy on Open Access](#) came into effect on 1 July

2015

[IARC Open Access Policy](#) launched 1 January

2019

DG and the Chief Scientist [announced](#) **WHO** would be the first UN agency to join cOAlition S on 19th August 2019.

2021

[Plan S](#) – **WHO** a member

The reproducibility crisis

RESEARCH ARTICLE SUMMARY

PSYCHOLOGY

Estimating the reproducibility of psychological science

Open Science Collaboration*

Science 2016

Why Most Published Research Findings
Are False

Will public trust in science
survive the pandemic? GLOBAL HEALTH

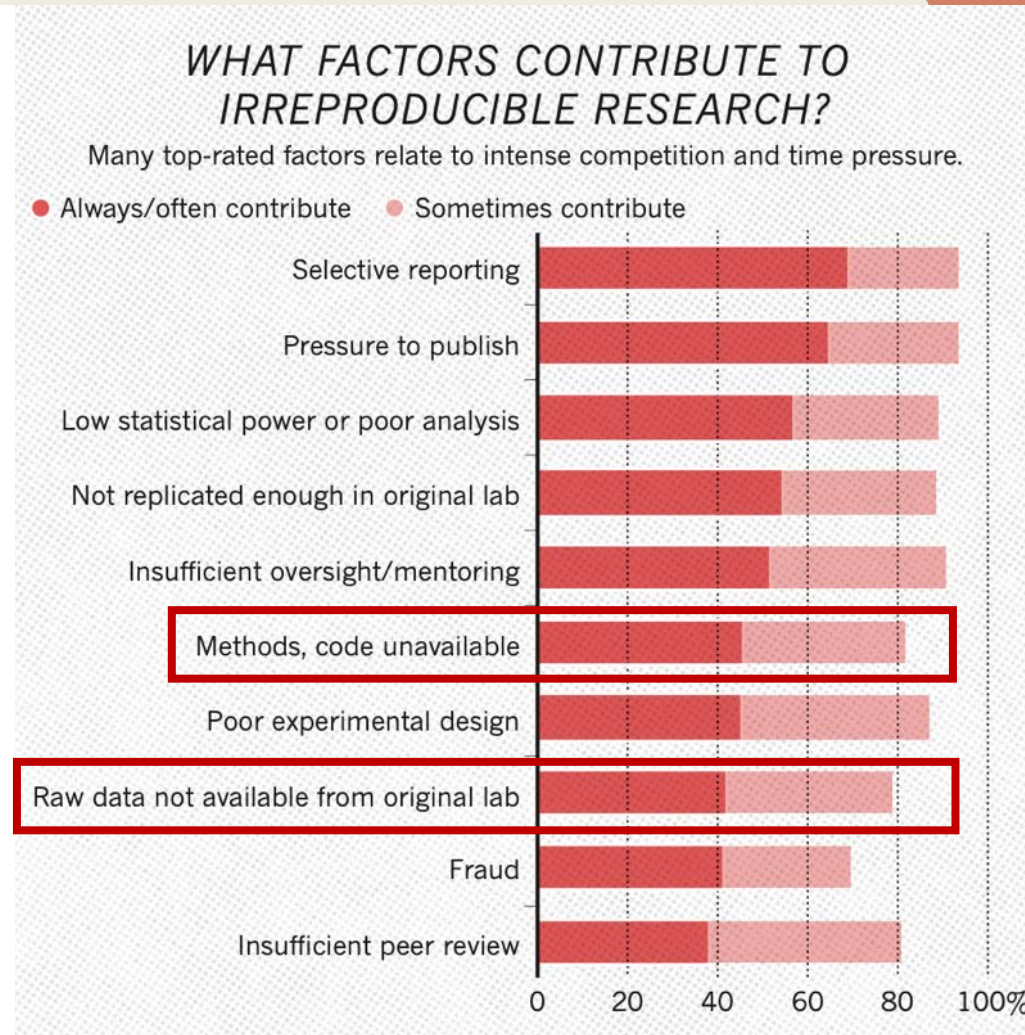
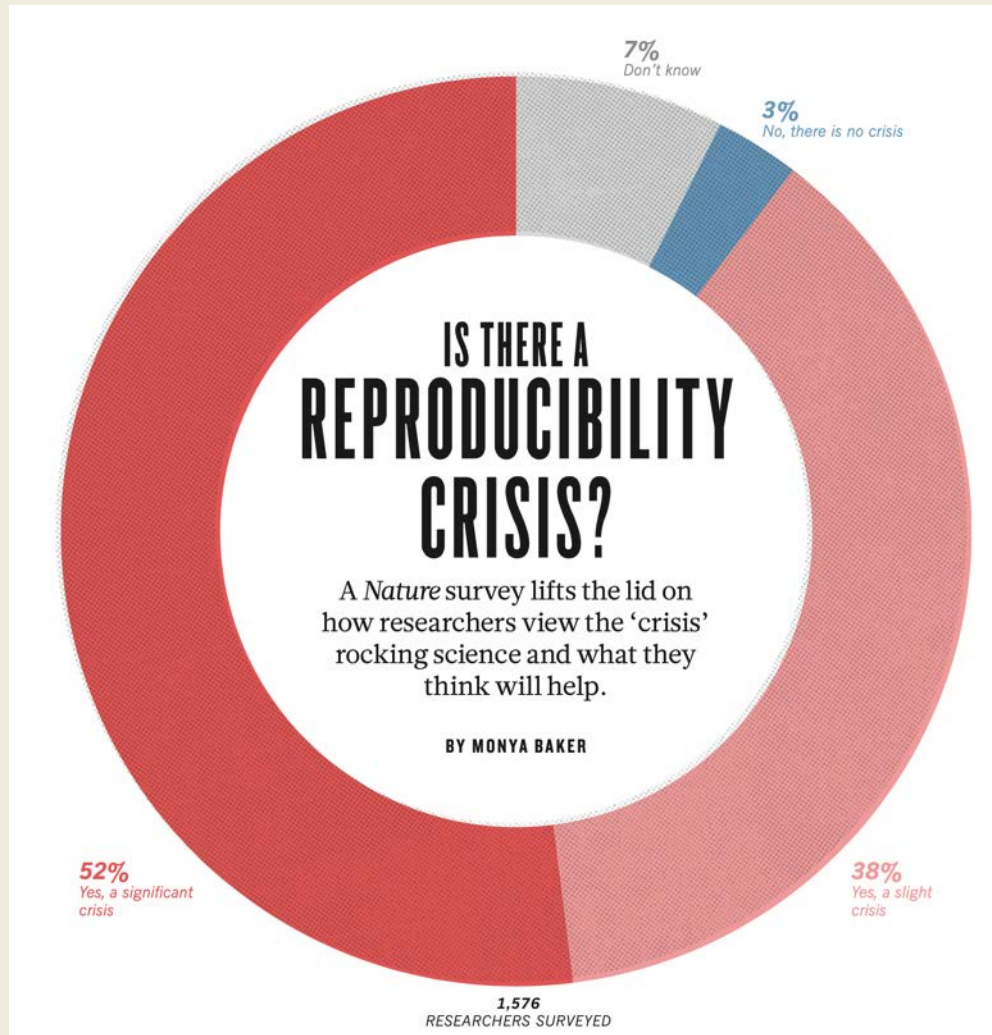
Peer review: a flawed process at the heart of science

Estimating the reproducibility of
psychological science

Believe it or not: how much can we
rely on published data on potential

Open Science Collaboration*

The reproducibility crisis



The reproducibility crisis



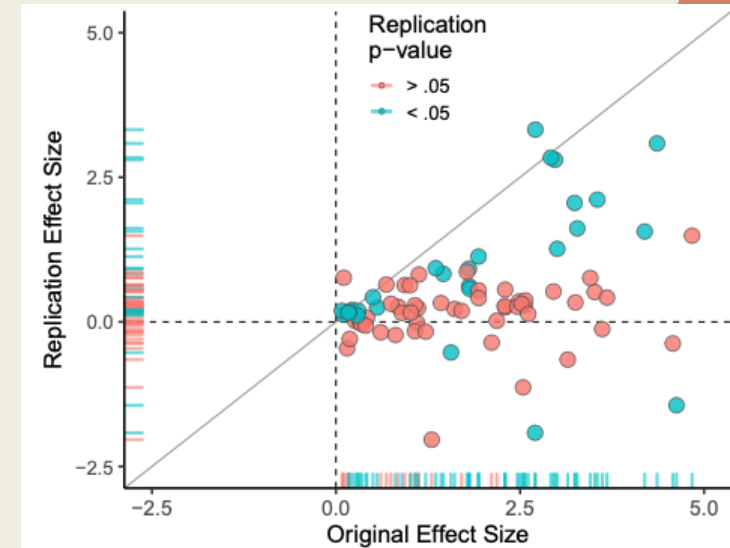
Investigating the replicability of preclinical cancer biology

Timothy M Errington^{1*}, Maya Mathur², Courtney K Soderberg¹, Alexandria Denis^{1†}, Nicole Perfito^{1‡}, Elizabeth Iorns³, Brian A Nosek^{1,4}



2021

- A total of 50 experiments from 23 papers were repeated, generating data about the replicability of a total of 158 effects.
- For positive effects, the median effect size in the replications was **85% smaller** than the median effect size in the original experiments.



Data sharing in practice

All data necessary to understand, assess, and extend the conclusions of the manuscript must be available to any reader of Science. All computer codes involved in the creation or analysis of data must also be available to any reader of Science. After publication, **all reasonable requests for data and materials must be fulfilled**. Any restrictions on the availability of data, codes, or materials, including fees and original data obtained from other sources (Materials Transfer Agreements), must be disclosed to the editors upon submission...

Science journal data sharing policy in 2011

All data used in the analysis must be available to any researcher for purposes of reproducing or extending the analysis [...]. Post-publication embargoes are **not permitted, nor are stipulations for readers to contact the authors**. [...]. Problems in obtaining access to published data are taken seriously by the Science Journals and can be reported at science_data@aaas.org.

Science journal data sharing policy in 2022



Journal of Clinical Epidemiology

Available online 30 May 2022

In Press, Journal Pre-proof



Original Article

Many researchers were not compliant with their published data sharing statement: mixed-methods study

Mirko Gabelica¹, Ružica Božić², Livia Puljak³

Results

Of 3556 analyzed articles, 3416 contained DAS. The most frequent DAS category (42%) indicated that the datasets are available on reasonable request. Among 1792 manuscripts in which DAS indicated that authors are willing to share their data, 1670 (93%) authors either did not respond or declined to share their data with us. Among 254 (14%) of 1792 authors who responded to our query for data sharing, only 122 (6.8%) provided the requested data.