Open data in life sciences: why and how

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Why?

The need for open science

- 4th paradigm, all science becomes computational
- Replicability: 90% of scientists consider that "we are in a reproducibility crisis"
- Research waste: "85% of biomedical research efforts are wasted"
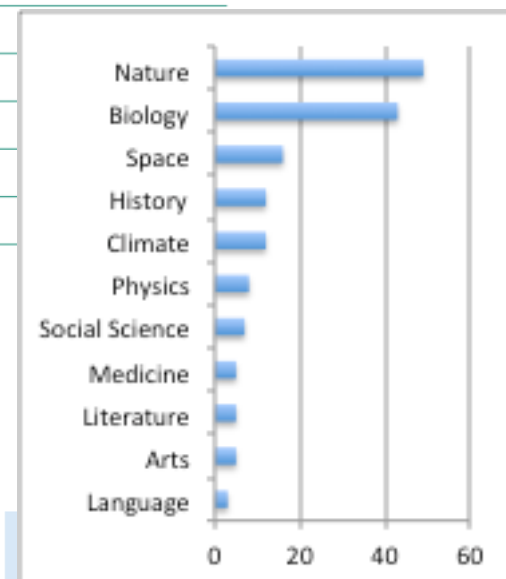- Attrition rate: "more than 80% of new drugs fail, usually in the late-stage of its development"

Osimo and Pujol, 2018. Opening Up Scientific Data For Innovation. Available at datalandscape.eu

Life science pioneering open science

Field of Science	% OA
Multidisciplinary	66%
Agriculture, forestry, fisheries	42%
Biological sciences	39%
Basic medical research	38%
Other agricultural science	38%
Other medical sciences	36%
Clinical medicine	34%
Health sciences	28%
Mathematics	27%

Table 3. Citations to data journals in different fields of science

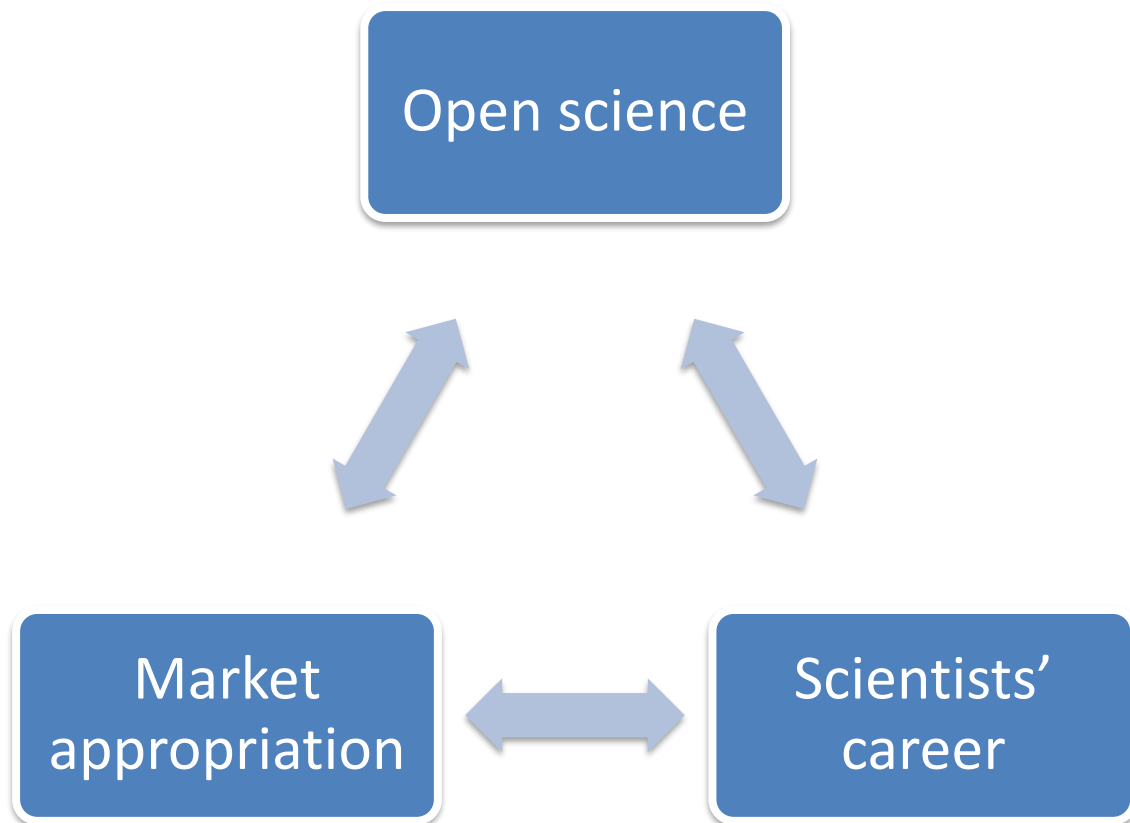| YEAR	NO. OF CITATIONS
Life sciences	563
Medical sciences	294
Earth and environmental sciences	246
Multidisciplinary journals	164
Chemistry, physics, and astronomy	146
Engineering sciences	34
Mathematics, statistics, and computer science	20
Social sciences	20
Health sciences	9
Culture	4
Economics, management, and planning	2
Information and communication sciences	2
Law	2

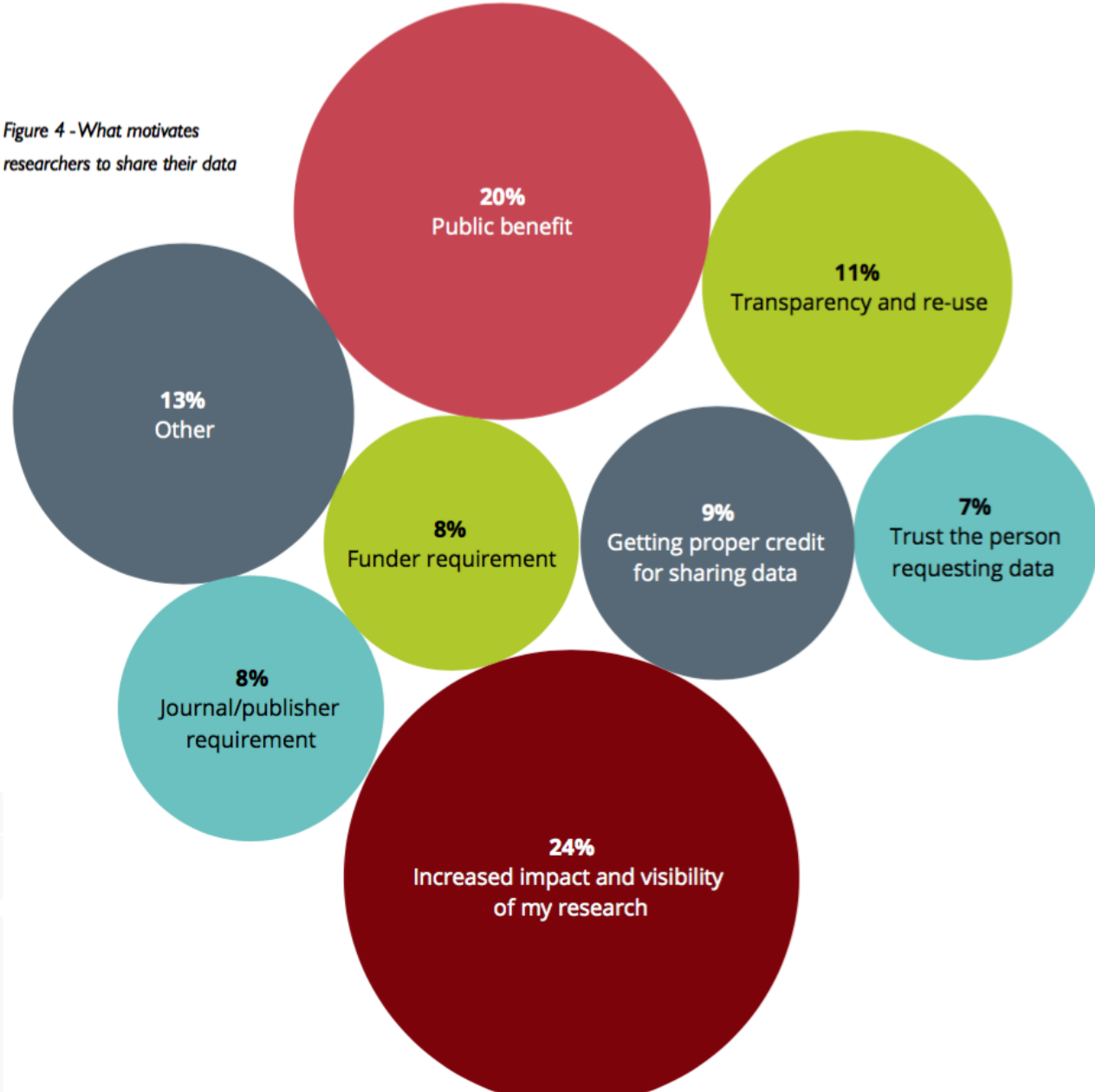Source: EC Open Science Monitor , forthcoming

How?

Tensions, not barriers

Carrots, not sticks

- Recognition
- Embargo periods
- Discriminatory access)
- Reporting
- Labels & badges
- Reputation, citability
- Funding for data sharing

- Funders' mandates have limited impact and are seldom enforced
- Relations, not transactions: Data markets *per se* does not work

Figure 4 - What motivates researchers to share their data

20%
Public benefit

11%
Transparency and re-use

13%
Other

8%
Funder requirement

9%
Getting proper credit for sharing data

7%
Trust the person requesting data

8%
Journal/publisher requirement

24%
Increased impact and visibility of my research

A continuum, not a binary choice

Source: OECD (2015), Data-Driven Innovation: Big Data for Growth and Well-Being, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264229358-en

Thanks

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Backup: GDPR

Open vs purpose-defined
Innovation without permission
Need for data hygiene