Dimensions Research Integrity

Digital Science Showcase

powered by Ripeta

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Dimensions

Part of **DIGITAL** science

Research Integrity Focus at Digital Science

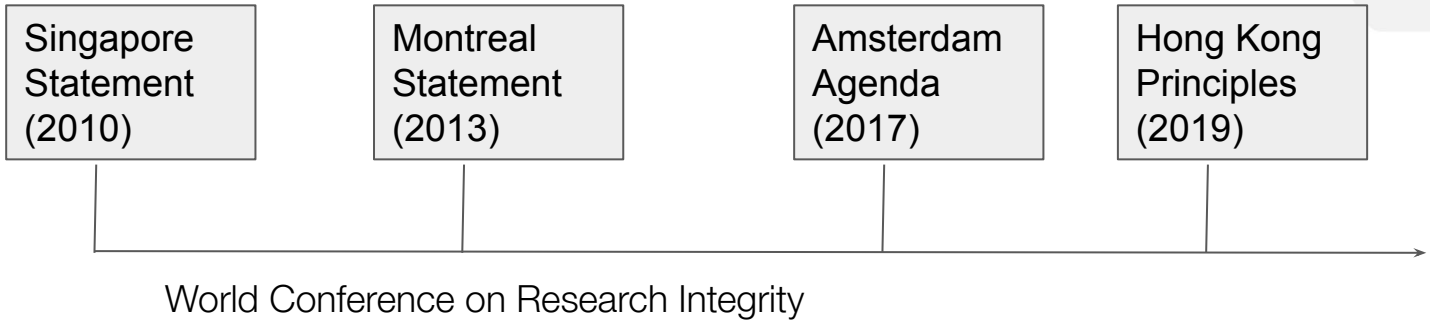
- Transformation of Research Integrity practice and expectations over the past decade.
  - How to use **Dimensions Research Integrity** to measure these changes, make strategic interventions, as well as improve workflows and practice

- Transformation of the role of **publishers** from reflecting research integrity practice to the front line of protecting trust in science

  - Using dimensions to detect social networks of suspicious publishing practice

- New Role: Digital Science Research Integrity (Dr Leslie McIntosh)

Trust Markers and the evolution of Research Integrity practice…



Standard Operating Principles for Research Integrity **(2020)**

https://sops4ri.eu/ (European Union)

Research Integrity practices and expectations for research institutions and funders have gradually been codified over the past decade

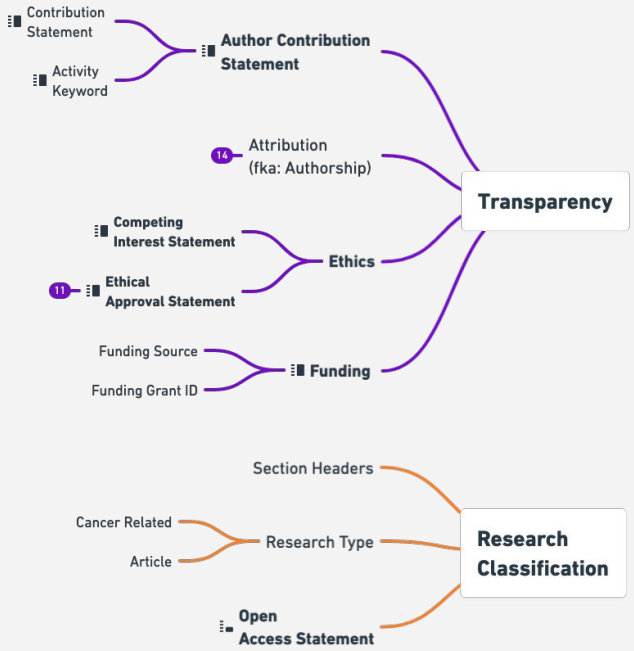
Publishers have played a critical role in ensuring that these practices are reflected in the research record

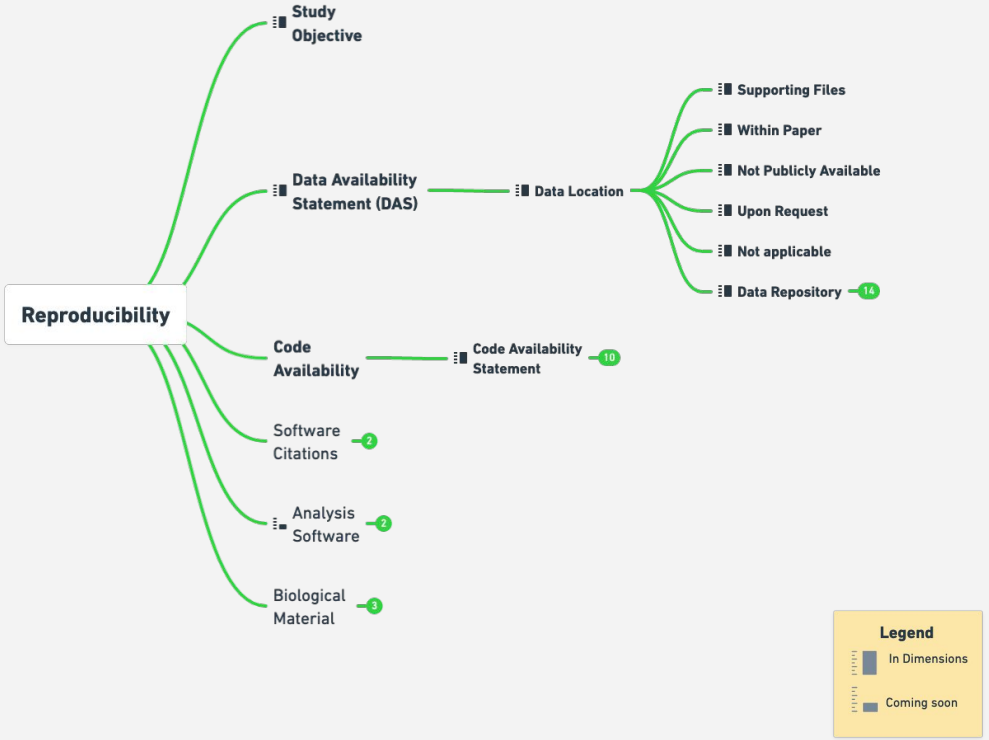
Trust Markers

- Funding Statements
- Ethical Approval Statements
- Conflicts of Interest
- Authorship
- Data Sharing

Trust Markers make research integrity practice visible

Trust Markers





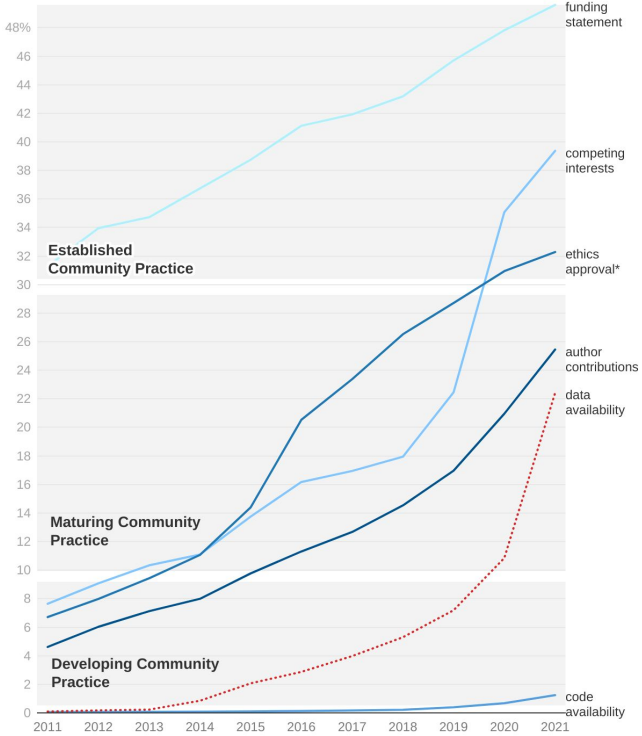
Dimensions Research Integrity
10+ Trust Markers, 33M+ data points

Trust Markers in research have increased dramatically over the last 10 years, with each Marker on a path to become an established part of research community practice

Source: Dimensions Research Integrity via Google Bigquery

Competing Interests Statements	⬆ 20%
Funding Statements	⬆ 20%
Ethics Approval	⬆ 25%
Author Contributions	⬆ 25%
Data Availability Statements	⬆ 20%
Code Availability Statements	New in 2019

Evolving Science Trust Markers 2011-2021



*The percentage of ethics papers are calculated over publications a mesh classification of Humans or Animals. the ethics trust marker looks at those papers that include a specific ethics section (as opposed to mentioning ethics approval somewhere in the text)

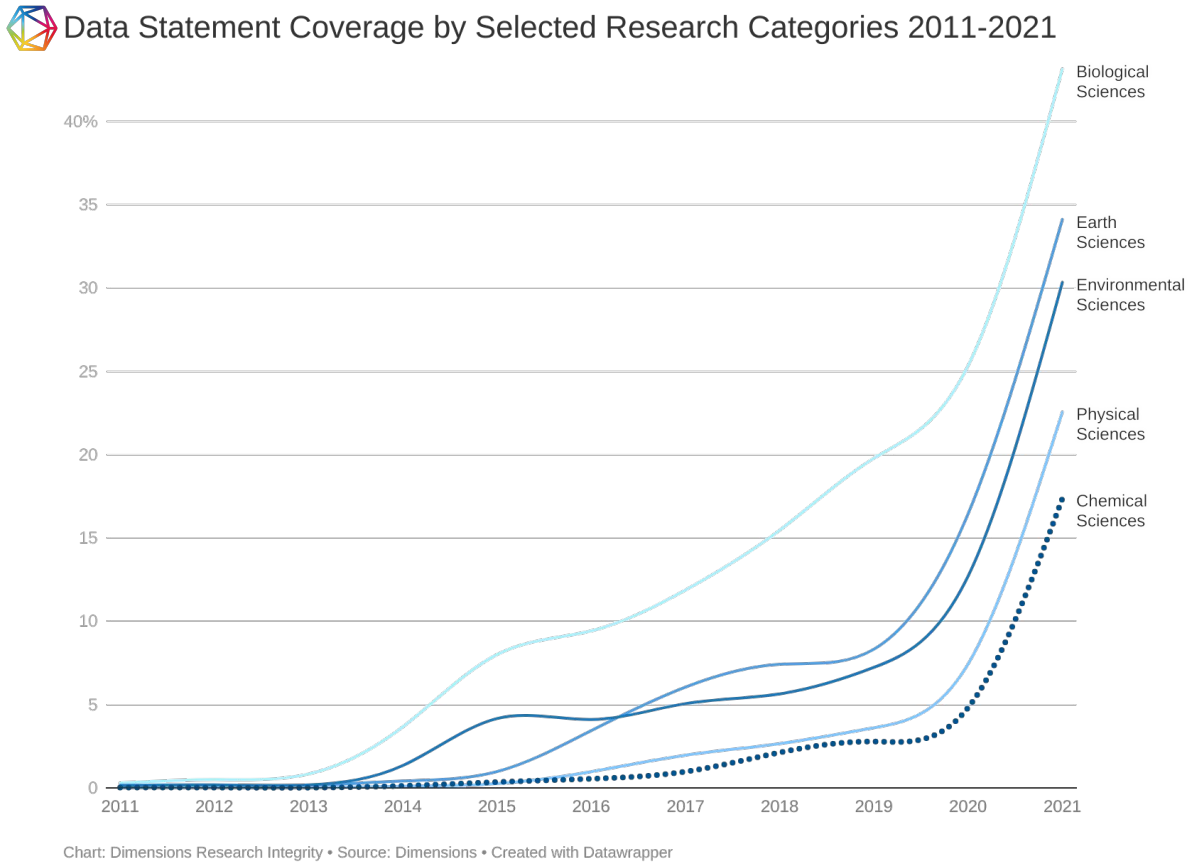
Chart: Dimensions Research Integrity • Source: Dimensions

Dimensions Research Integrity: Powered by Ripeta

Part of DIGITAL science

The rate of change of adoption Trust Markers differs by discipline

Through **Monitoring** and **Intervening**, Publishers, Funders, and Institutions can speed up changes in practice



Different Fields require different levels of engagement

For fields in band 1, there is already well established practice, and it would be reasonable to work towards 100% compliance

For band 2, there is awareness of the trust marker, but more training is required to shift practice.

For bands 3 and 4, low awareness is assumed, and significant training is required.

Research Integrity Policy Implementation Bands

Based on the adoption percentages for 2021, Fields of Research are assigned policy implementation bands. For fields in band 1, there is already well established practice, and it would be reasonable to work towards 100\% compliance for all papers for which a University has a corresponding author, or is a principle investigator on a funded project. For band 2, there is awareness of the trust marker, but more training is required to shift practice. For bands 3 low awareness is assumed, and significant training is required.

Field of research	Funding statement	Competing interests	Author contributions	Data availability	Ethics approval
Biomedical and Clinical Sciences	1	1	1	1	1
Health Sciences	1	1	1	1	1
Psychology	1	1	1	1	2
Biological Sciences	1	1	1	1	2
Environmental Sciences	1	1	2	2	2
Economics	1	1	2	2	2
Agricultural, Veterinary and Food Sciences	1	1	2	2	2
Chemical Sciences	1	1	2	2	2
Earth Sciences	1	1	2	2	2
Engineering	1	1	2	2	2
Built Environment and Design	1	1	2	2	
Physical Sciences	1	2	2	2	2
Human Society	1	2	2	2	2
Information and Computing Sciences	1	2	2	2	2
Mathematical Sciences	1	2	2	2	2
Commerce, Management, Tourism and Services	2	2	2	3	2
Education	2	2	3	3	1
Philosophy and Religious Studies	2	2	3	3	2
Creative Arts and Writing	2	2	3	3	
History, Heritage and Archaeology	2	2	3	3	
Language, Communication and Culture	2	2	3	3	
Law And Legal Studies	2	2	3	3	

Table: Dimensions Research Integrity • Source: Dimensions

Some Regions have made more progress than others

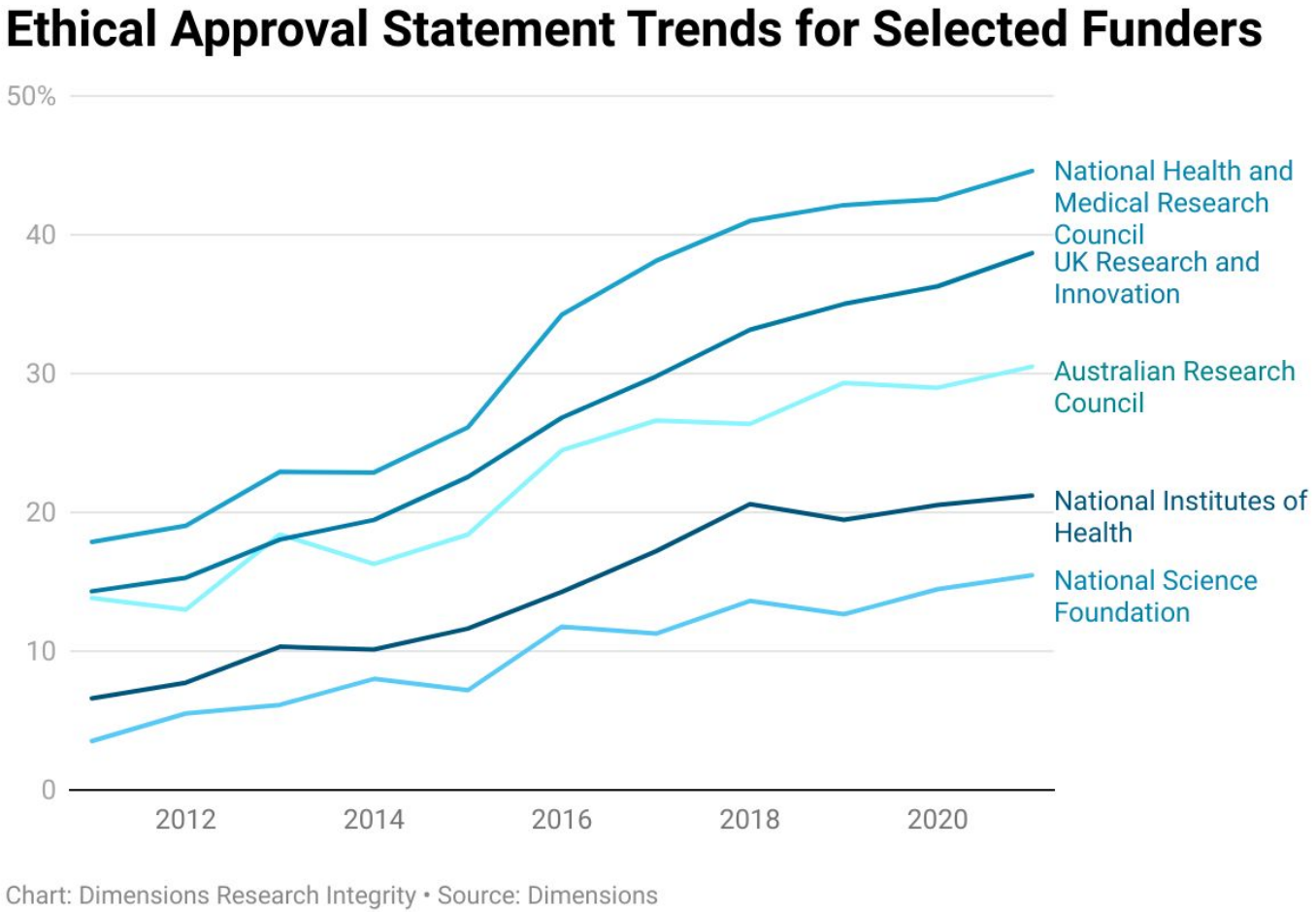
Research Integrity Policy Implementation Bands (Australia)

Based on the adoption percentages for 2021, Fields of Research are assigned policy implementation bands. For fields in band 1, there is already well established practice, and it would be reasonable to work towards 100\% compliance for all papers for which a University has a corresponding author, or is a principle investigator on a funded project. For band 2, there is awareness of the trust marker, but more training is required to shift practice. For bands 3 low awareness is assumed, and significant training is required.

Field of research	Funding statement	Competing interests	Author contributions	Data availability	Ethics approval
Agricultural, Veterinary And Food Sciences	1	1	1	1	1
Health Sciences	1	1	1	1	1
Psychology	1	1	1	1	1
Biomedical And Clinical Sciences	1	1	1	1	1
Biological Sciences	1	1	1	1	1
Earth Sciences	1	1	1	1	
Environmental Sciences	1	1	1	2	2
Chemical Sciences	1	1	1	2	2
Human Society	1	1	2	2	1
Engineering	1	1	2	2	2
History, Heritage And Archaeology	1	1	2	2	
Built Environment And Design	1	1	2	2	
Economics	1	1	2	2	
Education	1	1	2	2	
Information And Computing Sciences	1	1	2	2	
Law And Legal Studies	1	1	2	2	
Creative Arts And Writing	1	1	3	3	
Commerce, Management, Tourism And Services	1	1	3	3	
Language, Communication And Culture	1	1	3	3	
Physical Sciences	1	2	2	2	
Philosophy And Religious Studies	1	2	2	2	
Mathematical Sciences	1	2	3	2	

Table: Dimensions Research Integrity • Source: Dimensions

Trust Marker uptake by funder



Benchmarking Publishers

Open Access Publishers have made early moves to implement trust markers in their publications

publisher	first published year	publications	data availability statement percentage	authors contribution statement	competing interests statement	funding statement percentage	ethics approval
Public Library of Science (PLoS)	2001	17,214	100	99	100	89	31
Frontiers	2007	54,759	98	99	51	80	76
MDPI	1996	129,157	97	96	92	97	15
AIP Publishing	2013	11,378	97	16	58	62	3
Hindawi	1997	24,976	93	24	58	59	23
Springer Nature	1842	304,847	50	48	62	68	69
Wiley	1807	158,801	40	17	41	52	17
Oxford University Press (OUP)	1586	20,701	34	27	54	68	19
De Gruyter	1749	14,553	33	31	30	44	73
SAGE Publications	1965	38,970	26	17	39	82	29

Use Dimensions Research Integrity to benchmark Trust Marker uptake

At a deeper level, Trust Markers also reveal patterns of researcher behaviour, be it the need to encourage more researchers to deposit in online repositories

There is a marked difference between having data availability statements, and making data available in an appropriate repository

Source: Dimensions Research Integrity via Google Bigquery

Chemical Sciences Data Statement Coverage by Publisher

publisher	publications	publications with links to online repositories	online repository percentage
Elsevier	62,746	224	0.36%
American Chemical Society (ACS)	39,789	329	0.83%
Wiley	28,663	209	0.73%
Royal Society of Chemistry (RSC)	27,201	170	0.62%
MDPI	20,014	1,028	5.14%
Springer Nature	19,461	732	3.76%
Pleiades Publishing	4,193	0	0.00%
Taylor & Francis	3,276	15	0.46%
AIP Publishing	1,714	85	4.96%
The Electrochemical Society	1,563	3	0.19%

Table: Dimensions Research Integrity • Source: Dimensions

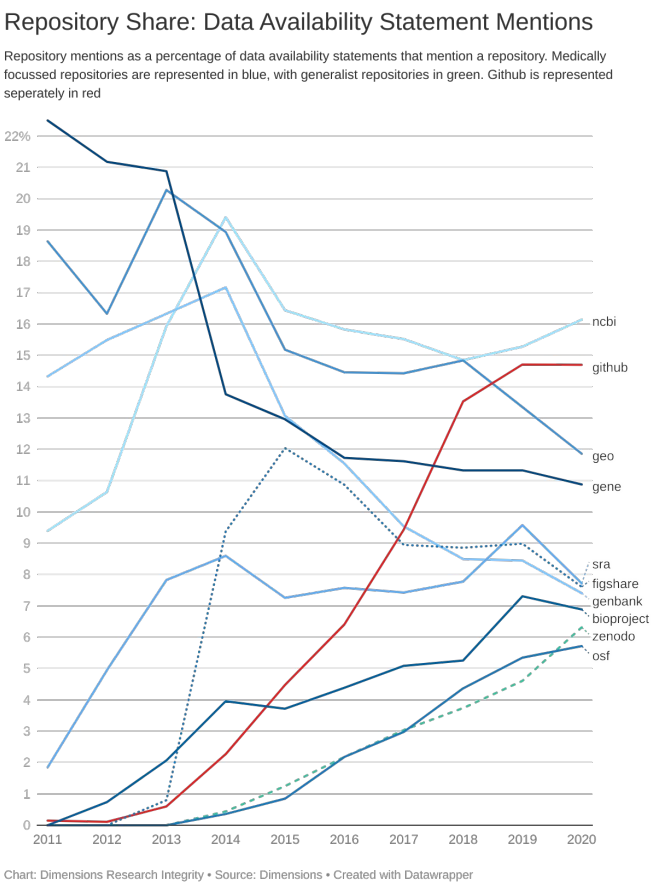
(Data filtered by Chemical Sciences)

Use Dimensions Research Integrity to benchmark Trust Marker uptake

…or identify the repositories that researchers are using using so that they can be better supported…

Github has become a 'repository' of choice for many researchers, but how many are also persistently creating a copy of their code/data in repository?

Source: Dimensions Research Integrity via Google Bigquery

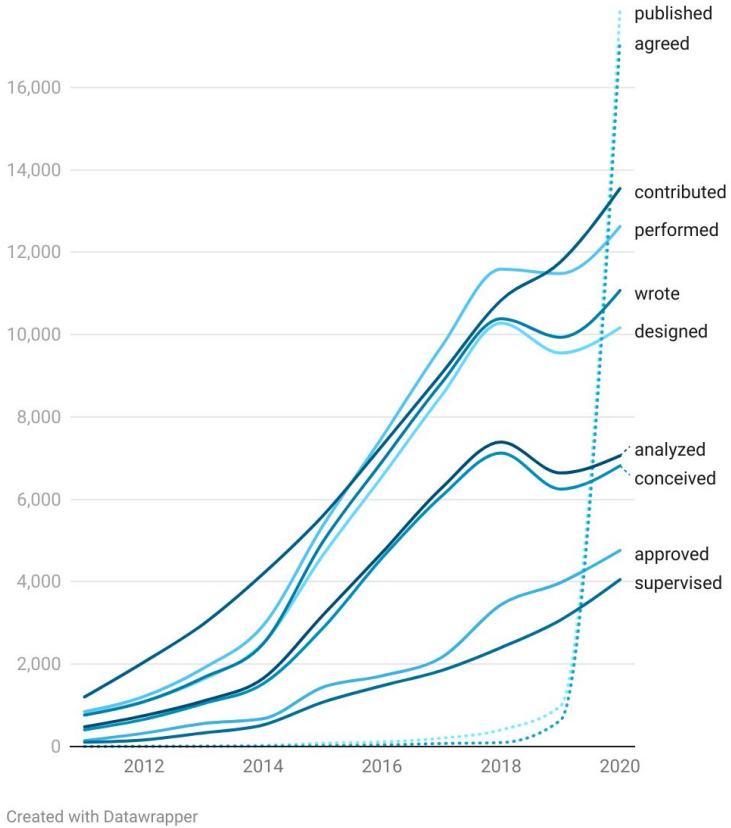


Use Dimensions Research Integrity to find trends within Trust Markers

In the Chemical Sciences, since 2019 new language is being added within Author Contribution statements

*"All authors have read and **agreed** to the **published** version of the manuscript…"*

Source: Dimensions Research Integrity via Google Bigquery



Repository Market Share

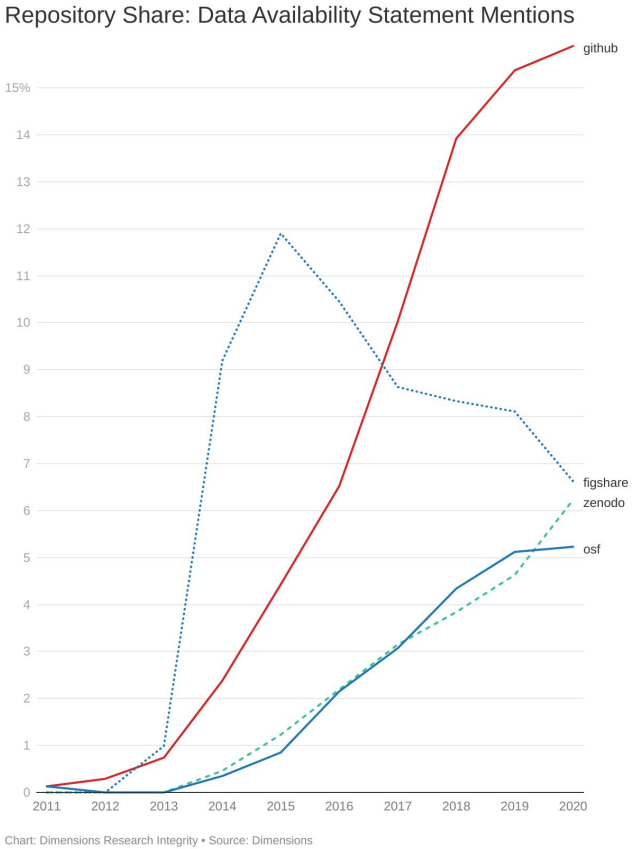


Chart: Dimensions Research Integrity • Source: Dimensions

Repository Market Share

1% 56%

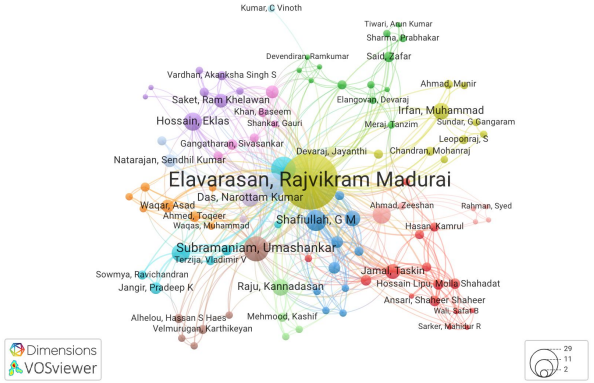
Field of research	GitHub	Figshare	Zenodo	OSF
Agricultural, Veterinary And Food Sciences	8%	8%	5%	2%
Biological Sciences	17%	6%	6%	1%
Biomedical And Clinical Sciences	13%	5%	4%	4%
Built Environment And Design	23%	11%	14%	3%
Chemical Sciences	16%	4%	10%	1%
Commerce, Management, Tourism And Services	16%	8%	6%	12%
Creative Arts And Writing	31%	8%	9%	32%
Earth Sciences	12%	9%	27%	2%
Economics	26%	7%	11%	15%
Education	9%	12%	7%	27%
Engineering	**19%**	**5%**	**10%**	**1%**
Environmental Sciences	17%	13%	15%	3%
Health Sciences	18%	7%	6%	11%
History, Heritage And Archaeology	16%	7%	17%	8%
Human Society	16%	5%	6%	12%
Information And Computing Sciences	**56%**	**7%**	**13%**	**7%**
Language, Communication And Culture	24%	5%	6%	48%
Law And Legal Studies	28%	5%	15%	17%
Mathematical Sciences	**46%**	**3%**	**7%**	**4%**
Philosophy And Religious Studies	14%	10%	7%	34%
Physical Sciences	**25%**	**4%**	**19%**	**2%**
Psychology	16%	6%	4%	48%

Table: Dimensions Research Integrity • Source: Dimensions

Using **Dimensions** research networks to identify **suspicious authors**

progressive filters	Student	Postdoc
greater than 20 publications	1,938	5,170
and unique coauthor network shape	1,638	4,867
and most frequent collaborator is young	854	2,126
and less than 30 percent same county	159	399
and degree difference greater than 10	156	395
and postdocs students greater than 58 percent	61	122

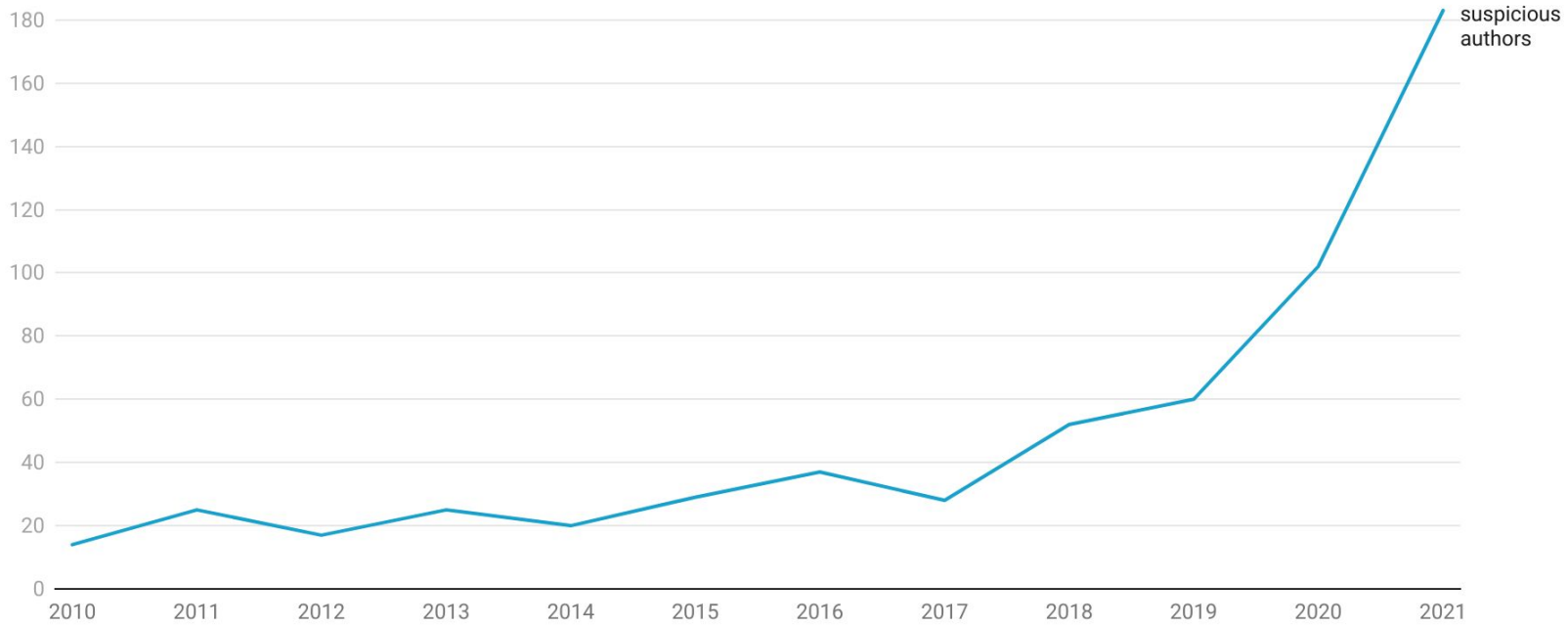
(2021 - per year statistics)



Example of a suspicious network

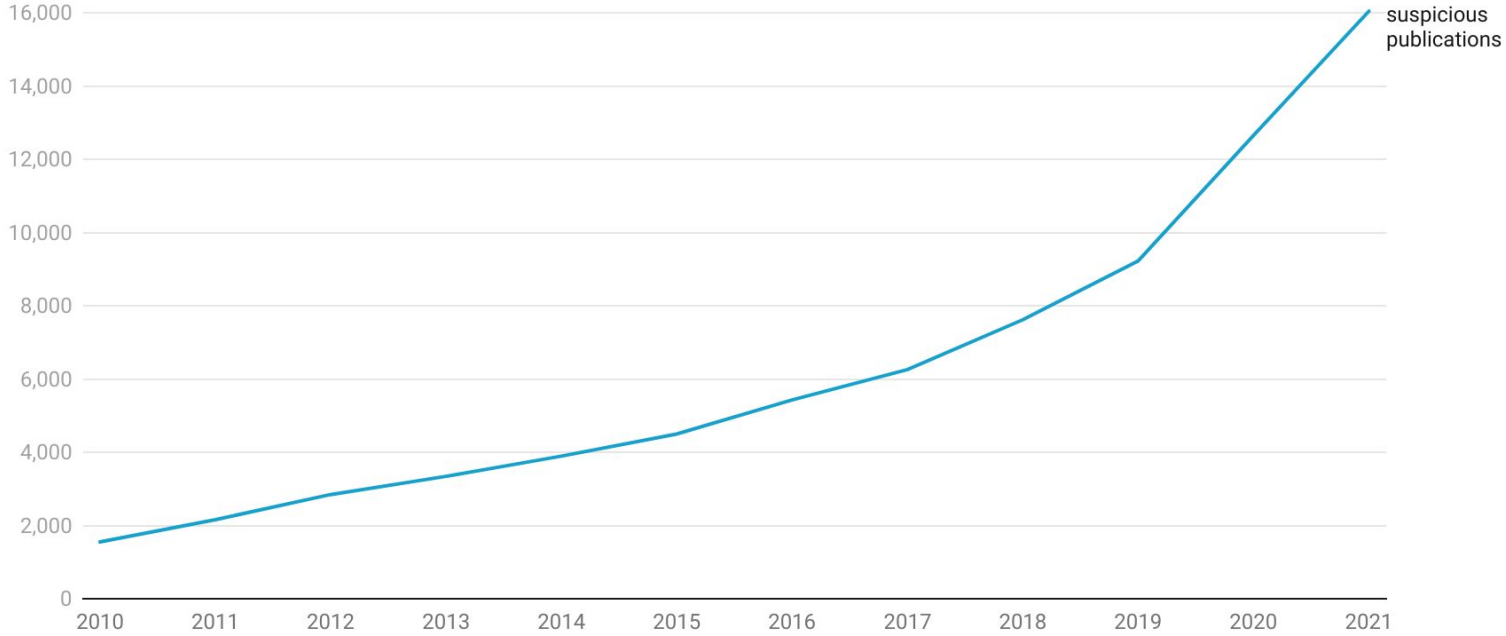
Using **Dimensions** research networks to identify **suspicious authors**

The number of *really* suspicious authors per year has increased by 570% since 2017



Using **Dimensions** research networks to identify **suspicious authors**

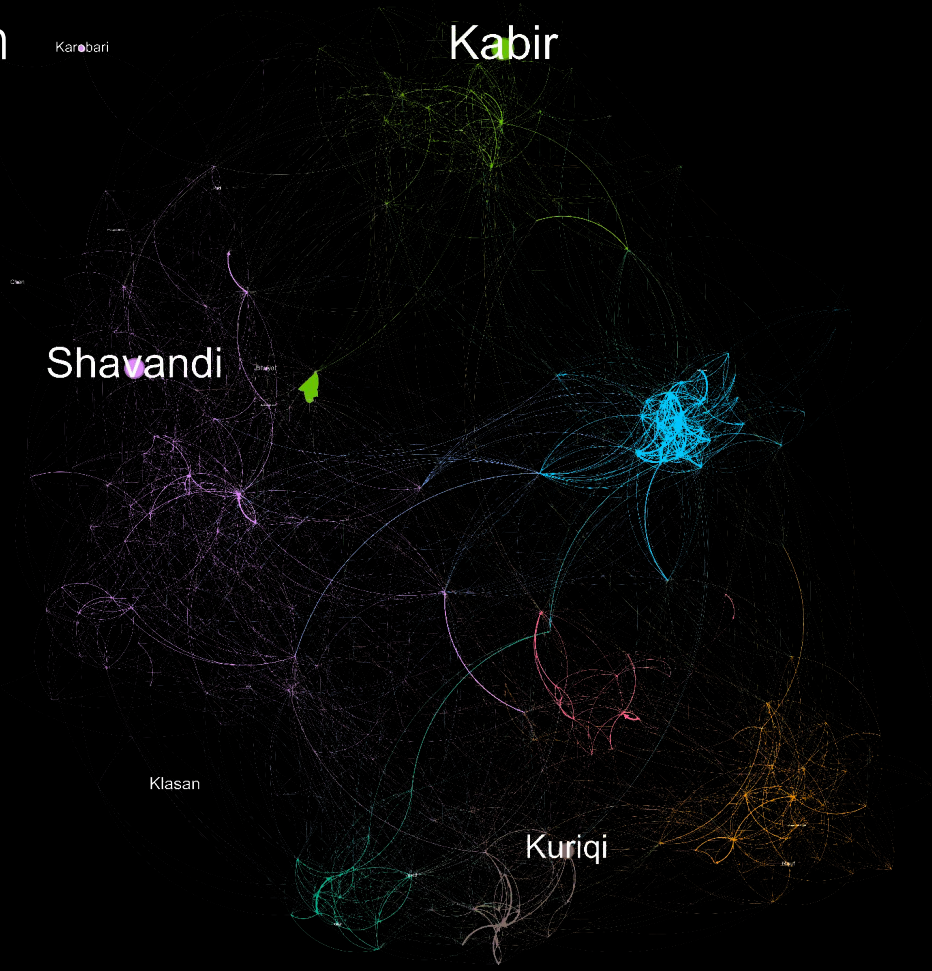
Publications produced by *really suspicious* authors



Suspicious Author Citation graph

Citations between suspicious authors that do not coauthor with each other

Highlighted researchers have between 129 and 400! Peer reviews in ORCID



Dimensions Research Integrity and your institution

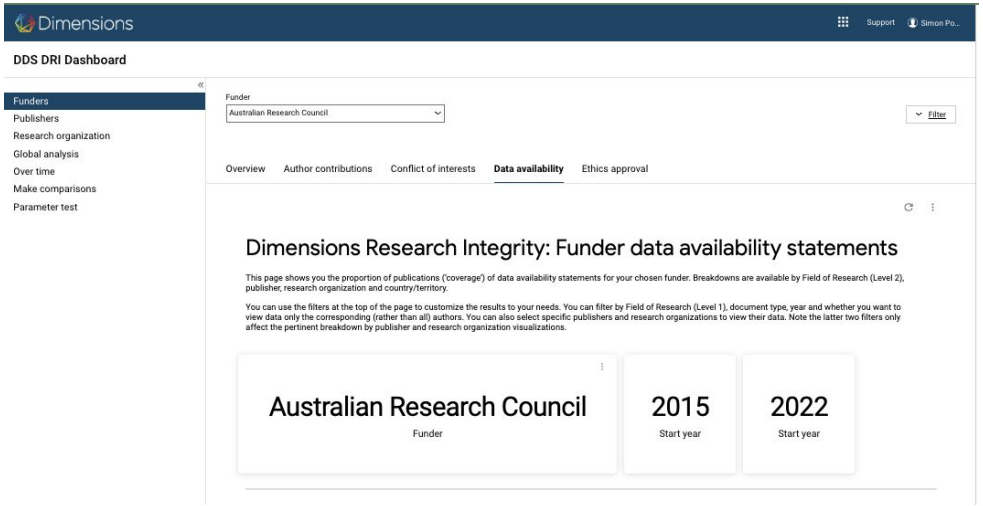
Consultancy Report:

Socialise Trust Marker Analysis within the University

Assist with training/strategy planning

Monitor data sharing behaviour

Dashboards (soon):



Breakdown by Field of Research

This table breaks down coverage of the trust marker at Field of Research (Level 2) level. This enables you to compare fields and identify areas of relatively high and/or low coverage. Used in conjunction with the *Field of Research* filter at the top of the page, you can focus in on interdisciplinary areas of research.

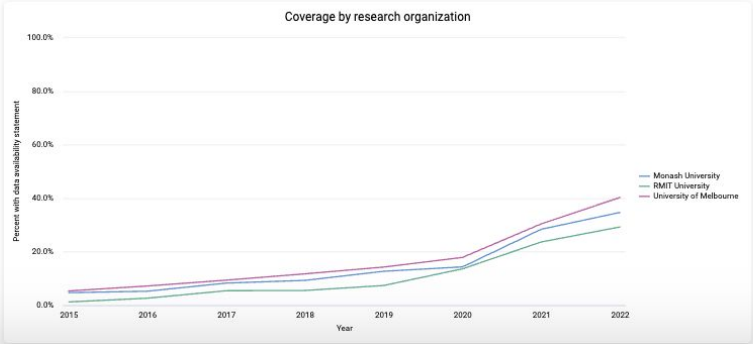
Coverage by Field of Research

	Field of Research (Level 2)	2022 Percent with data availability statement	2021 Percent with data availability statement	2020 Percent with data availability statement	2019 Percent with data availability statement	2018 Percent with data availability statement	2017 Percent with data availability statement	2016 Percent with data availability statement	2015 Percent with data availability statement
1	Geoinformatics	100.0%	37.5%	0.0%	6.7%	0.0%	0.0%	11.1%	0.0%
2	Oceanography	74.4%	67.9%	39.5%	21.2%	15.3%	10.6%	10.0%	3.1%
3	Oncology And Carcinogenesis	71.4%	51.7%	23.4%	22.8%	25.0%	12.7%	12.7%	10.5%
4	Atmospheric Sciences	70.4%	58.6%	33.1%	23.4%	18.3%	19.6%	9.5%	1.9%
5	Climate Change Science	69.2%	50.8%	32.4%	22.4%	13.0%	11.9%	2.2%	2.5%
6	Neurosciences	68.2%	30.8%	33.7%	20.2%	19.2%	11.8%	8.7%	3.4%
7	Plant Biology	65.7%	42.0%	26.3%	17.2%	12.0%	14.0%	9.7%	8.5%
8	Medical Microbiology	65.5%	64.9%	52.7%	43.4%	33.7%	38.2%	20.6%	16.7%
9	Bioinformatics And Computational Biology	63.5%	71.4%	48.6%	52.3%	43.6%	32.7%	29.8%	26.0%
10	Medical Biochemistry And Metabolomics	62.5%	43.8%	28.6%	27.3%	0.0%	25.0%	15.4%	0.0%
11	Biochemistry And Cell Biology	61.9%	49.5%	32.5%	26.4%	24.0%	19.3%	11.8%	12.2%
12	Veterinary Sciences	61.9%	37.0%	30.6%	19.4%	31.3%	29.7%	26.7%	25.7%
13	Microbiology	61.9%	59.0%	41.0%	39.7%	25.4%	23.2%	18.1%	14.6%
14	Nutrition And Dietetics	61.8%	29.2%	20.5%	17.0%	16.7%	22.9%	6.0%	7.4%
15	Fisheries Sciences	61.5%	21.1%	15.8%	29.4%	11.8%	15.4%	22.2%	22.7%
16	Medicinal And Biomolecular Chemistry	61.2%	36.4%	6.3%	4.8%	4.9%	2.6%	6.1%	8.2%
17	Genetics	60.5%	63.6%	46.7%	41.7%	35.9%	31.2%	27.2%	24.6%

Level 2 Field of Research breakdown of data availability statement coverage over time.

Breakdown by research organization

This chart breakdowns coverage of trust markers across research organizations, for work the chosen funder has funded. You can use the corresponding author filter to limit this data only to the affiliation(s) of the *corresponding author(s)*. You can use the *Research organization(s)* filter to choose your own selection.



Workshop Question 1:

How can you imagine using this data within your institution?

Year 1?

Year 2?

Year 3?

Libraries?

Training?

Faculties and Schools?

Workshop Question 2:

Are there ways that we shouldn't use this information?

Reporting at the Researcher Level?

Beyond Trust Markers

Workshop 3

Is there a useful way that we could surface information this information responsibly in a dashboard?

Reporting at the Researcher Level?

Bonus Tour: