FAIR and TRUST
a perfect couple

Ingrid Dillo, Deputy Director DANS
UCLAC Webinar Series
October 2020

Topics

DANS

Data sharing: the why

Data quality

FAIR data

Trust

Repository certification

Data Archiving and Networked Services
DANS

DANS is about keeping data FAIR

Mission: enhancing scientific quality by facilitating reuse of research data

National Centre of Expertise Research Data

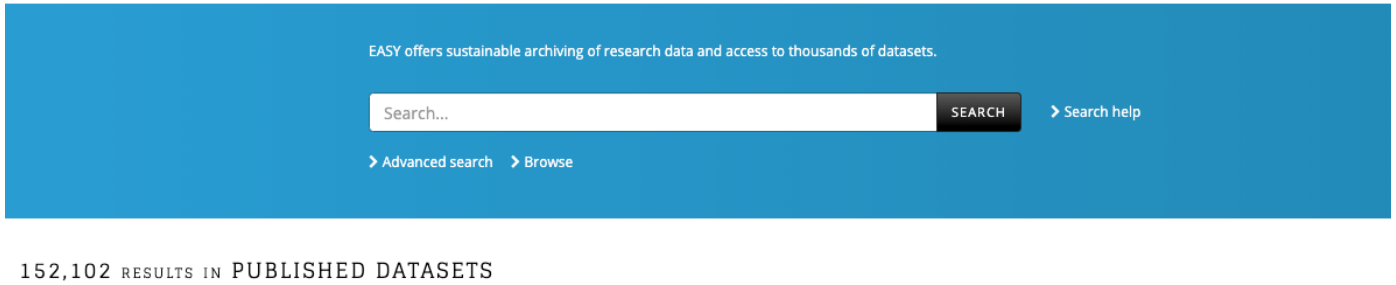
Institute of Dutch Academy and Research Funding Organisation (KNAW & NWO) since 2005

First predecessor dates back to 1964 (Steinmetz Foundation), Historical Data Archive 1989

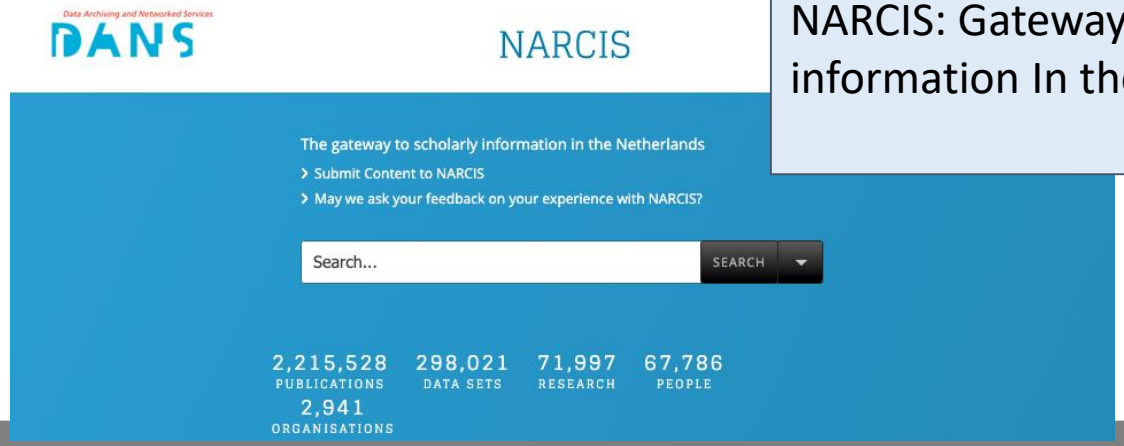
Data Archiving and Networked Services
DANS

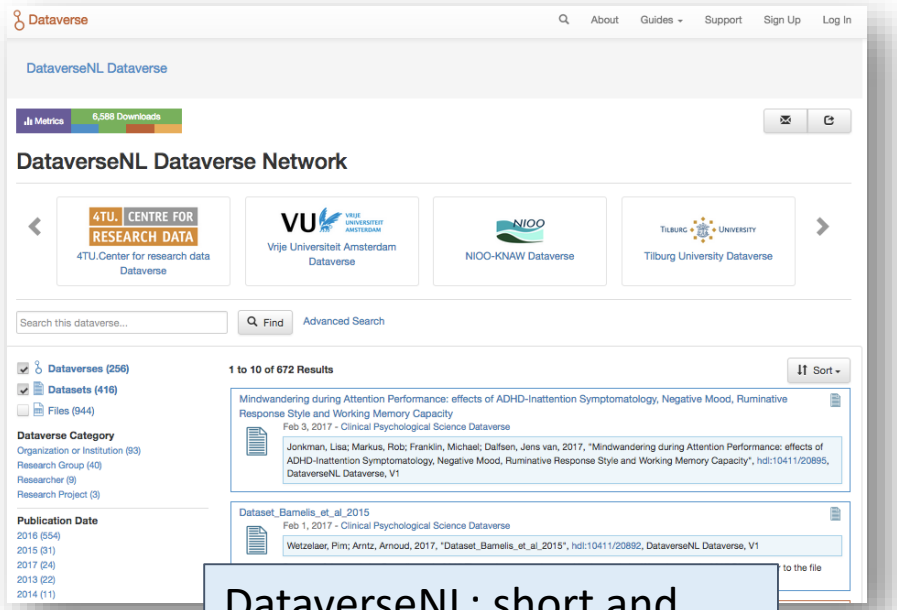
DANS Core Services

EASY: certified long-term data repository



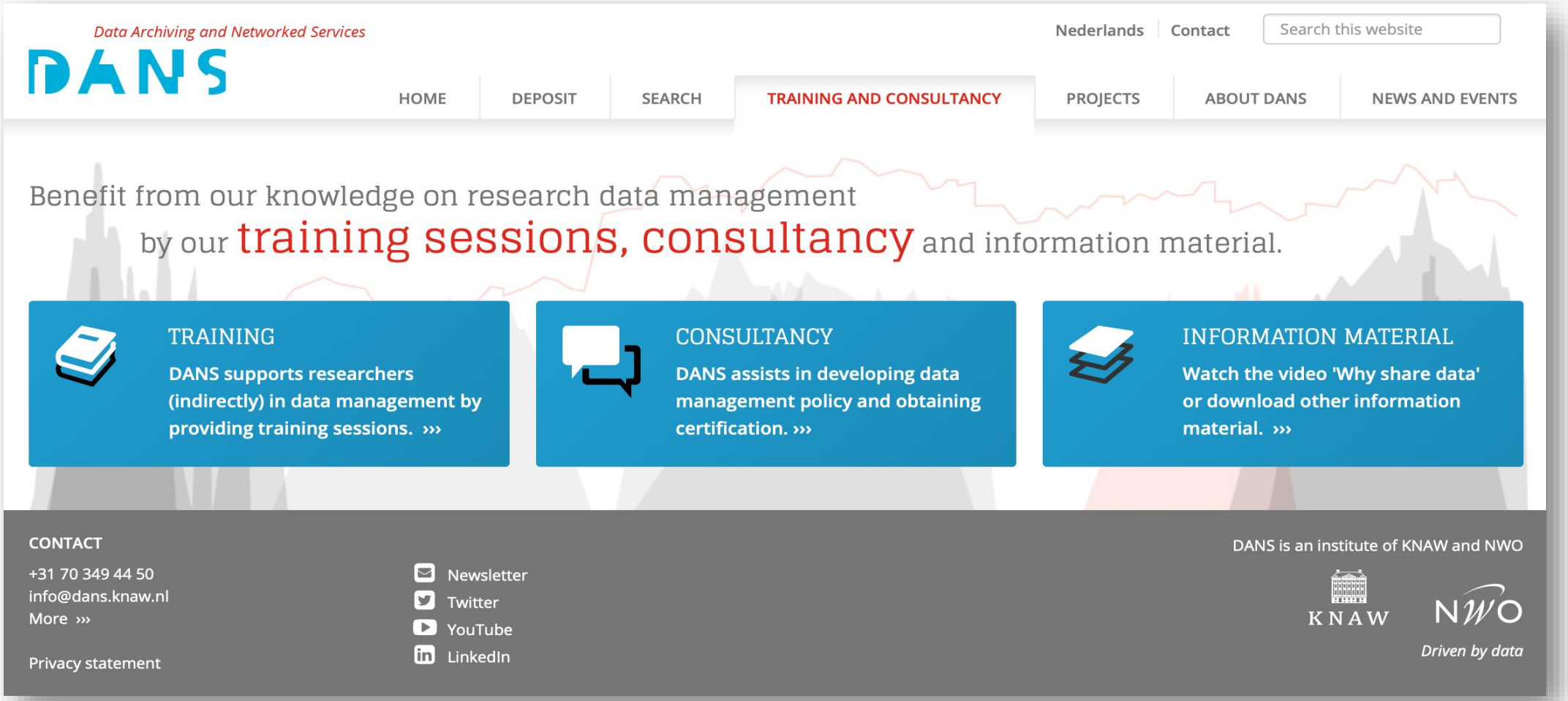
NARCIS: Gateway to scholarly information In the Netherlands





DataverseNL: short and mid-term data storage

DANS Core Services



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Open Science

free exchange of information
for the good of science and society at large

Components of Open Science

Open science

Open science is an umbrella term for transparent science with ease of access to all products from beginning to end

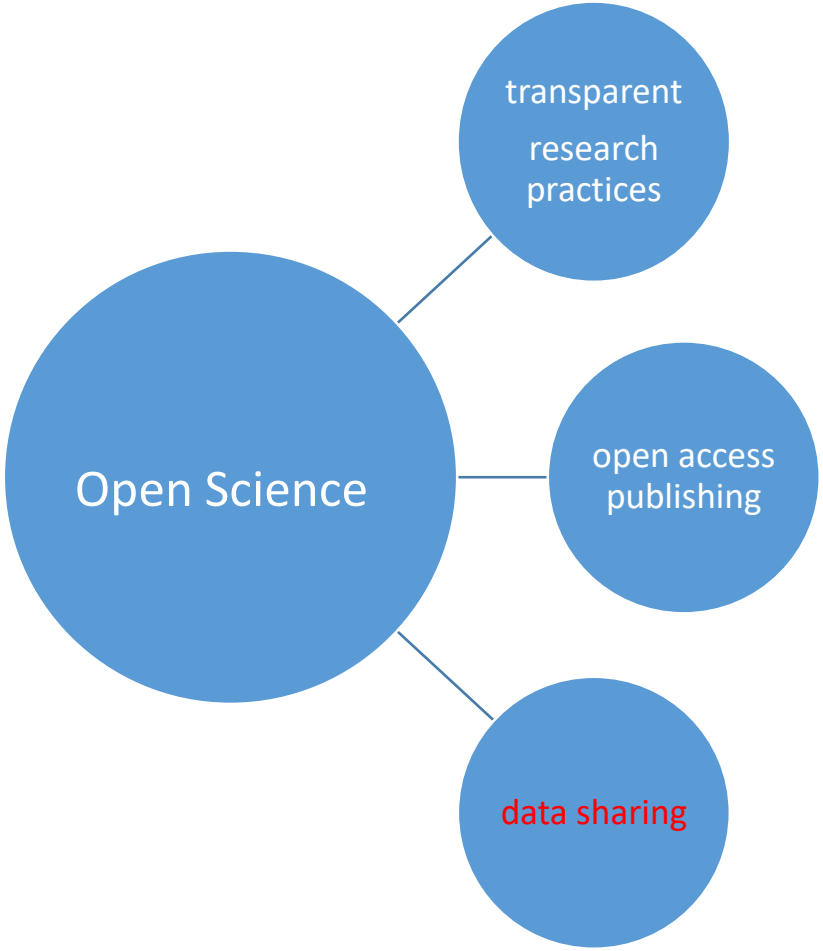

Image credit: Gema Bueno de la Fuente by CC-BY

Why data sharing is important

Replication and validation of research outcomes
(scientific integrity and transparency)

nature
International weekly journal of science

News

Report finds massive fraud at Dutch universities

Investigation claims dozens of social-psychology papers contain faked data.

The New York Times

Fraud Case Seen as a Red Flag for Psychology Research

By BENEDICT CAREY
Published: November 2, 2011

A well-known psychologist in the Netherlands whose work has been published widely in professional journals falsified data and made up entire experiments, an investigating committee has found. Experts say the case exposes deep flaws in the way science is done in a field, psychology, that has only recently earned a fragile respectability.

ScienceInsider
Breaking news and analysis from the world of science policy

Report: Dutch 'Lord of the Data' Forged Dozens of Studies (UPDATE)

by Gretchen Vogel on 31 October 2011, 7:05 PM | 34 Comments

SPIEGEL ONLINE

Niederlande

Renommierter Psychologe gesteht Fälschungen

the guardian

Public sector can combat fraud with data sharing

Outsourcing is not the only thing to blame for procurement fraud, says **Graham Kemp**, and the public sector needs to view data less as a security risk but knowledge to be shared

PLoS one
accelerating the publication of peer-reviewed science

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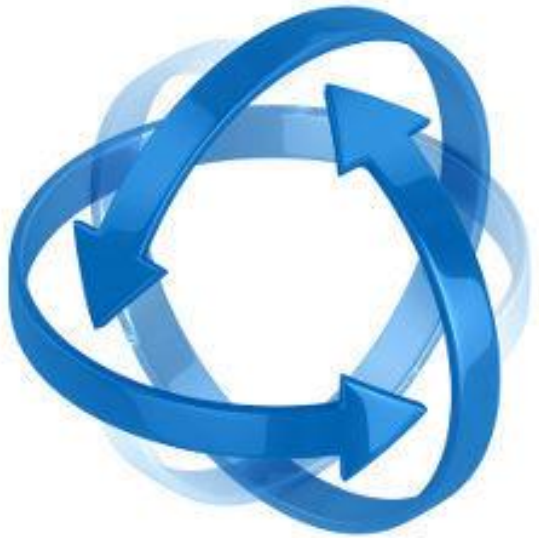
RESEARCH ARTICLE OPEN ACCESS

How Many Scientists Fabricate and Falsify Research? A Systematic Review and Meta-Analysis of Survey Data

Why data sharing is important

Re-use of data (efficiency, return on investment, standing on the shoulders of others)



ESC
European Society of Cardiology

16 year study suggests air temperature is external trigger for heart attack

28 Aug 2017

Topic(s): *Environmental and Cardiovascular Disease;*

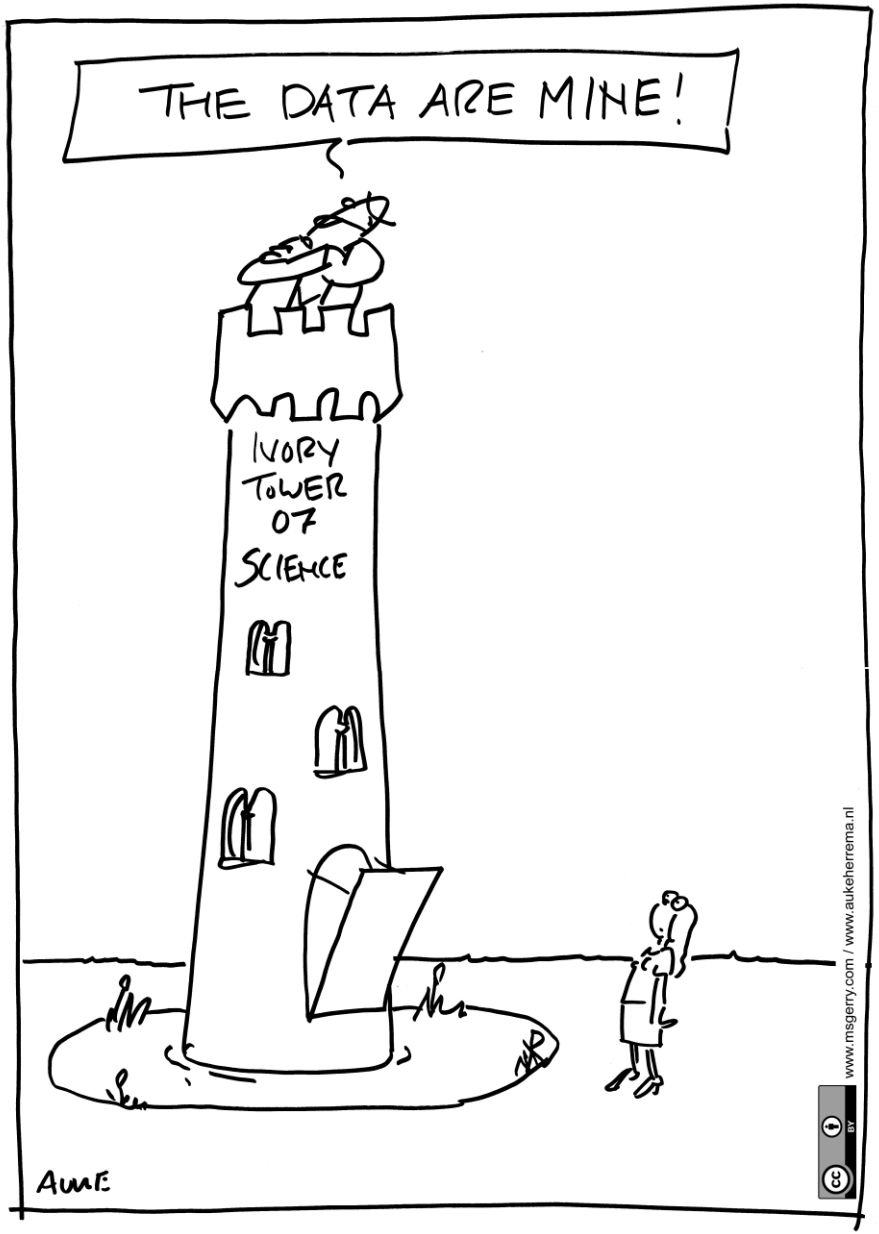
Barcelona, Spain – 28 Aug 2017: A 16 year study in more than 280 000 patients has suggested that air temperature is an external trigger for heart attack. The findings are presented today at ESC Congress. (1)

"There is seasonal variation in the occurrence of heart attack, with incidence declining in summer and peaking in winter," said first author Dr Moman A. Mohammad, from the Department of Cardiology at Lund University, Skane University Hospital, Lund, Sweden. "It is unclear whether this is due to colder temperatures or behavioural changes."

This nationwide, 16 year, observational study led by Prof David Erlinge from Lund University, is the largest to investigate the association between heart attack incidence and weather conditions such as air temperature, sunshine duration, precipitation, and air pressure.

Using the Swedish myocardial infarction registry (SWEDEHEART), all consecutive heart attacks treated at a coronary care unit between 1 January 1998 and 31 December 2013 were included in the study. The investigators studied the specific weather conditions during which heart attacks occurred using local meteorological data from hundreds of weather stations in the Swedish Meteorological and Hydrological Institute (SMHI).

https://www.escardio.org/The-ESC/Press-Office/Press-releases/16-year-study-suggests-air-temperature-is-external-trigger-for-heart-attack

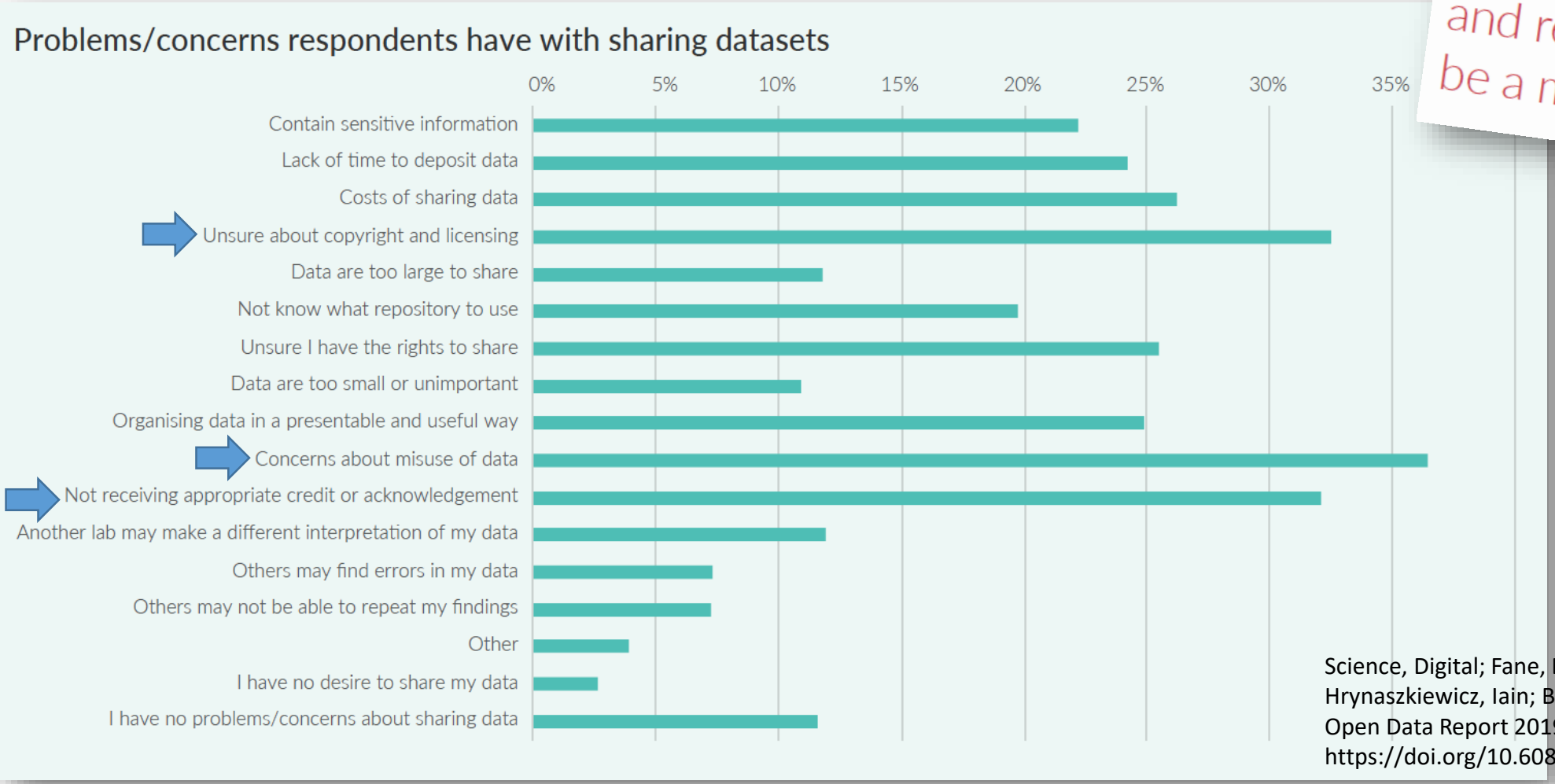


SCENE FROM THE PAST?

THE FUTURE?

…but what about the researchers?

"The biggest barrier to research data sharing and reuse seems to be a matter of trust"



Science, Digital; Fane, Briony; Ayris, Paul; Hahnel, Mark; Hrynaszkiewicz, Iain; Baynes, Grace; et al. (2019): The State of Open Data Report 2019. figshare. Report. https://doi.org/10.6084/m9.figshare.9980783.v2

Topics

DANS

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Data quality

Trust is a central element in research.

The data re-user wants to know:

- Where do these data come from?
- How were they collected?
- What has happened with them along the way?

Quality - provenance

Quality dimensions

- Scientific quality
- Fitness for use
- Technical quality

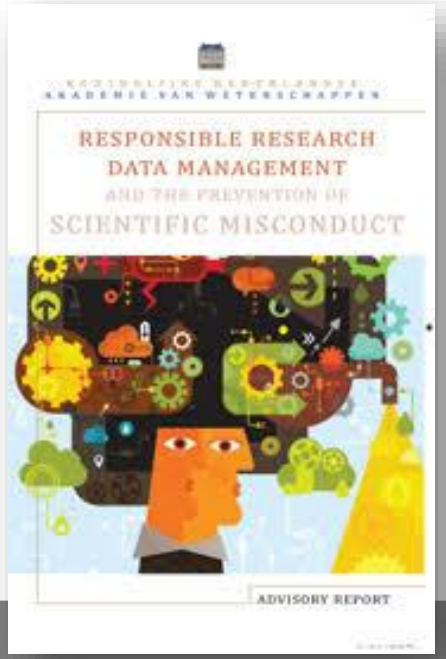
Dimension 1: Scientific quality

Principles:

Honesty, scrupulousness, transparency, independence, responsibility.

Shared responsibility:

- the *individual* responsibility of the researcher;
- the *institutional* context within which the research is carried out;
- the informal *networks* that play a vital role within the research community.



Dimension 2: Fitness for use

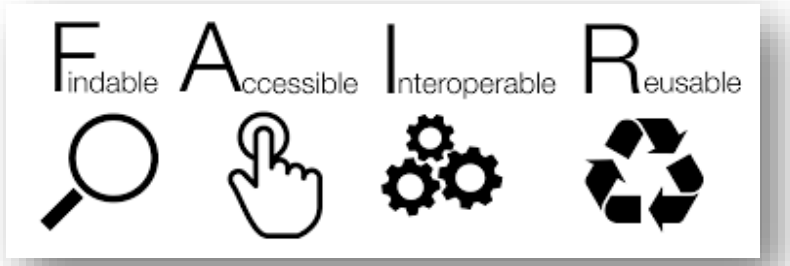
- definition of data quality as “fitness for use”
- data quality judgement depending on data consumers

Wang, R. Y., & Strong, D. M. (1996) Beyond Accuracy: What Data Quality Means to Data Consumers. *Journal of Management Information Systems 12*(4),

Dimension 3: Technical data quality

Based on UK Data Archive lifecycle: https://www.ukdataservice.ac.uk/manage-data/lifecycle

- As a product, data have quality, resulting from the process by which data are generated.
- Managing and documenting data through all stages helps to build trust.



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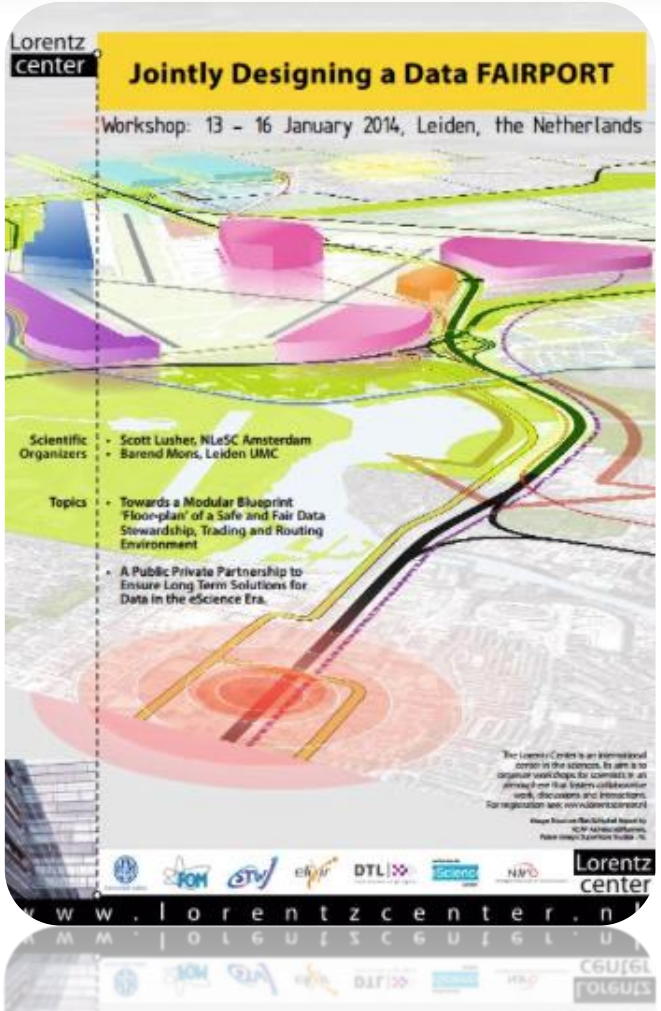
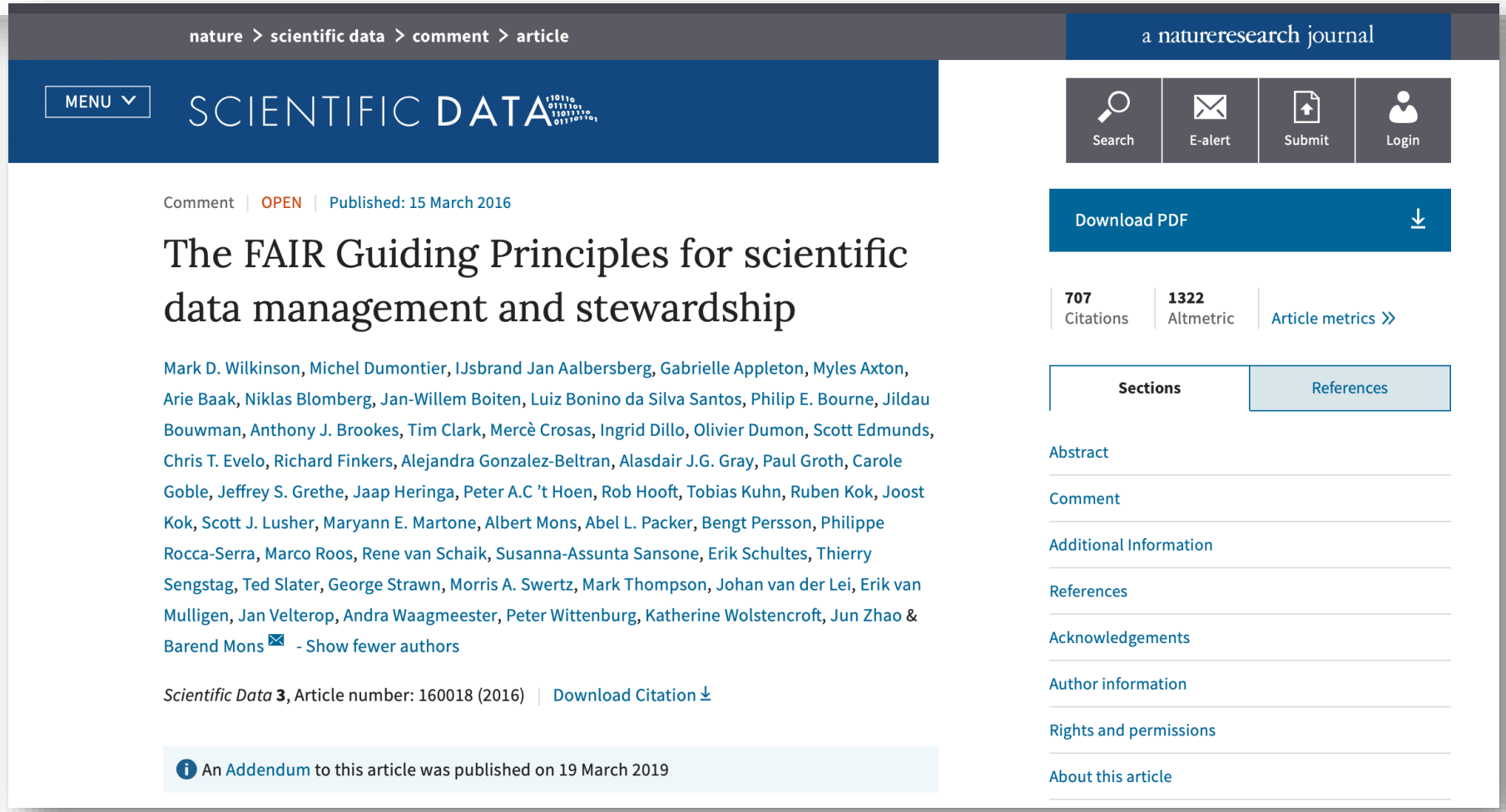
FAIR Data Principles (2014)

During a workshop for the life sciences in Leiden in 2014 a minimal set of community-agreed guiding principles were formulated.



- F: Easy to find by both humans and machines based on metadata
- A: With well-defined use license and access conditions (Open Access if possible)
- I: Ready to be linked with other datasets
- R: Ready to be re-used for future research and to be processed further using computational methods and tools

FAIR guiding principles (2016)



nature > scientific data > comment > article

a natureresearch journal

MENU

SCIENTIFIC DATA

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Comment | OPEN | Published: 15 March 2016

The FAIR Guiding Principles for scientific data management and stewardship

Mark D. Wilkinson, Michel Dumontier, IJsbrand Jan Aalbersberg, Gabrielle Appleton, Myles Axton, Arie Baak, Niklas Blomberg, Jan-Willem Boiten, Luiz Bonino da Silva Santos, Philip E. Bourne, Jildau Bouwman, Anthony J. Brookes, Tim Clark, Mercè Crosas, Ingrid Dillo, Olivier Dumon, Scott Edmunds, Chris T. Evelo, Richard Finkers, Alejandra Gonzalez-Beltran, Alasdair J.G. Gray, Paul Groth, Carole Goble, Jeffrey S. Grethe, Jaap Heringa, Peter A.C 't Hoen, Rob Hooft, Tobias Kuhn, Ruben Kok, Joost Kok, Scott J. Lusher, Maryann E. Martone, Albert Mons, Abel L. Packer, Bengt Persson, Philippe Rocca-Serra, Marco Roos, Rene van Schaik, Susanna-Assunta Sansone, Erik Schultes, Thierry Sengstag, Ted Slater, George Strawn, Morris A. Swertz, Mark Thompson, Johan van der Lei, Erik van Mulligen, Jan Velterop, Andra Waagmeester, Peter Wittenburg, Katherine Wolstencroft, Jun Zhao & Barend Mons - Show fewer authors

Scientific Data **3**, Article number: 160018 (2016) | Download Citation

An Addendum to this article was published on 19 March 2019

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707 Citations | 1322 Altmetric | Article metrics

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- Comment
- Additional Information
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https://www.nature.com/articles/sdata201618

FAIR metrics

Box 2 | The FAIR Guiding Principles

To be Findable:
F1. (meta)data are assigned a globally unique and persistent identifier
F2. data are described with rich metadata (defined by R1 below)
F3. metadata clearly and explicitly include the identifier of the data it describes
F4. (meta)data are registered or indexed in a searchable resource

15 Criteria

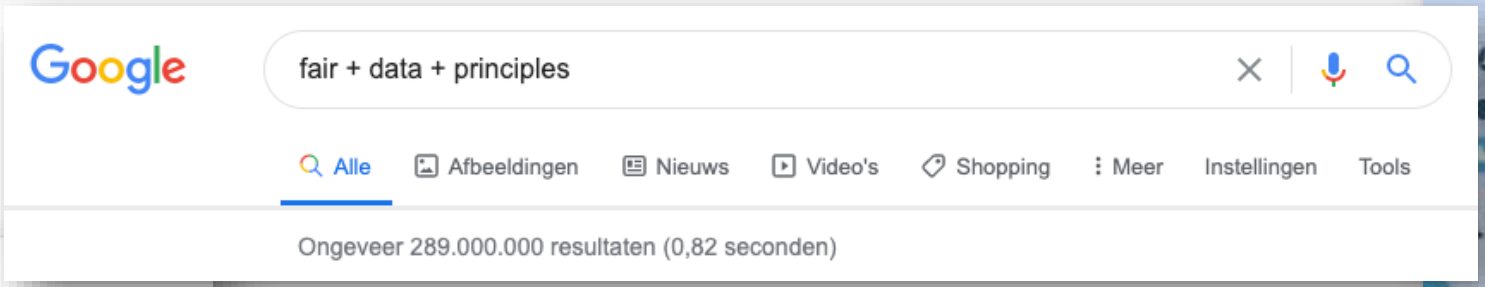
To be Accessible:
A1. (meta)data are retrievable by their identifier using a standardized communications protocol
A1.1 the protocol is open, free, and universally implementable
A1.2 the protocol allows for an authentication and authorization procedure, where necessary
A2. metadata are accessible, even when the data are no longer available

To be Interoperable:
I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
I2. (meta)data use vocabularies that follow FAIR principles
I3. (meta)data include qualified references to other (meta)data

To be Reusable:
R1. meta(data) are richly described with a plurality of accurate and relevant attributes
R1.1. (meta)data are released with a clear and accessible data usage license
R1.2. (meta)data are associated with detailed provenance
R1.3. (meta)data meet domain-relevant community standards

See: http://datafairport.org/fair-principles-living-document-menu and https://www.force11.org/group/fairgroup/fairprinciples

Policy makers/funders and FAIR



EUROPEAN COMMISSION
Directorate-General for Research & Innovation

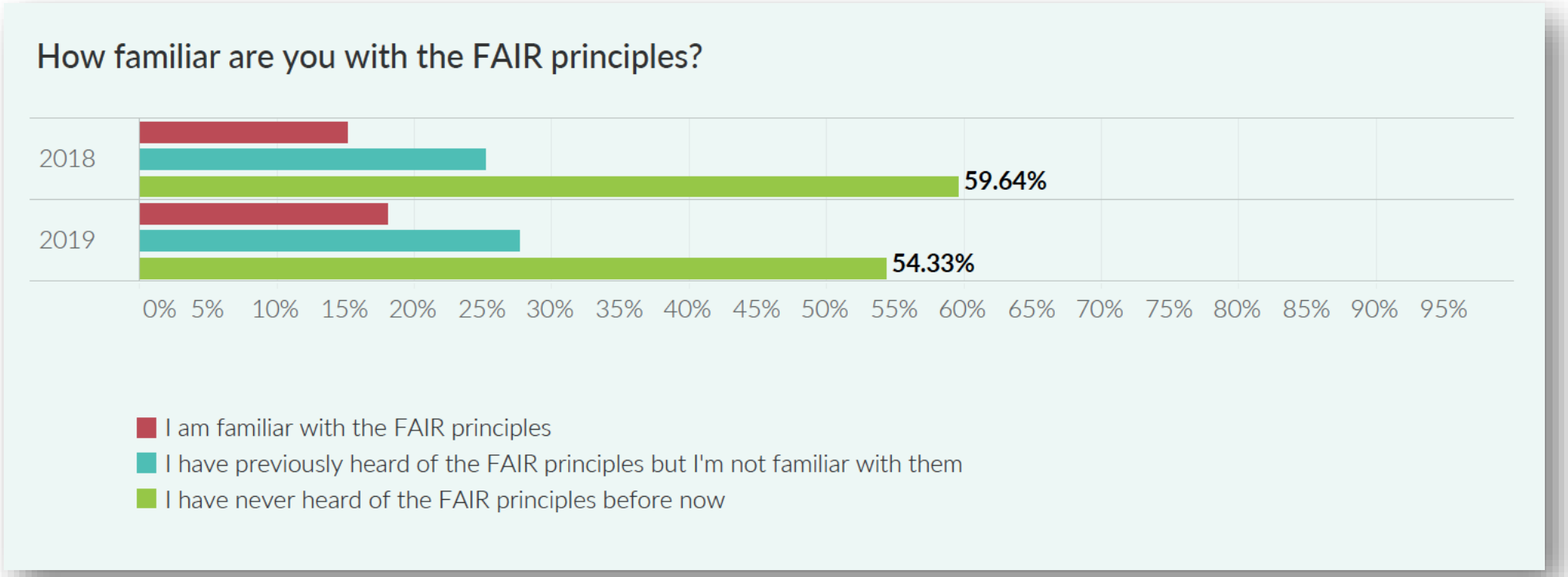
H2020 Programme

Guidelines on

FAIR Data Management in Horizon 2020

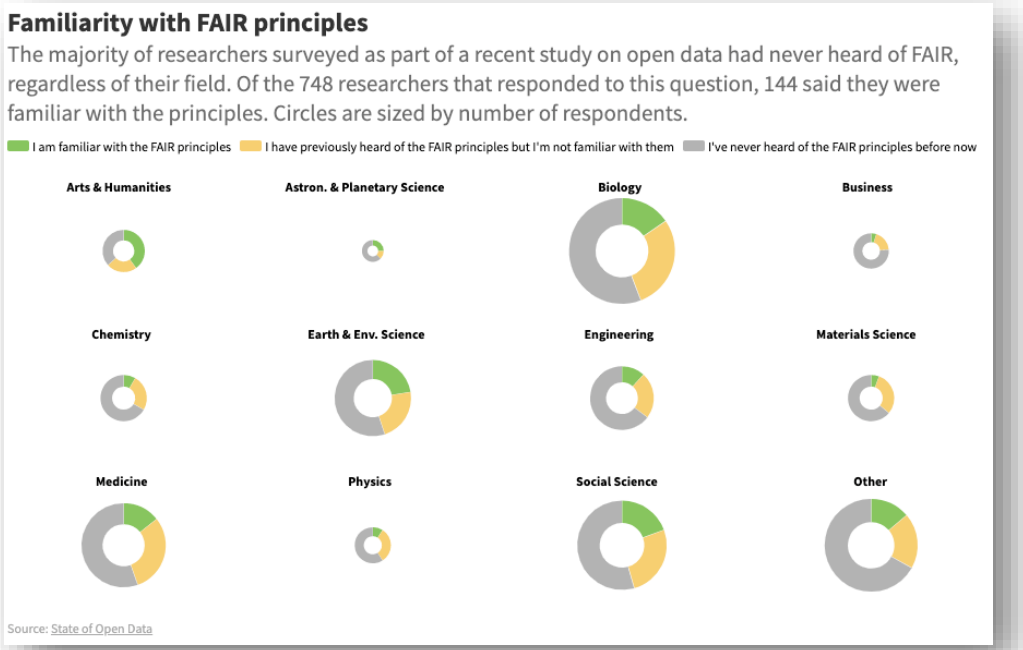
https://publications.europa.eu/en/publication-detail/-/publication/7769a148-f1f6-11e8-9982-01aa75ed71a1/language-en/format-PDF/source-80611283

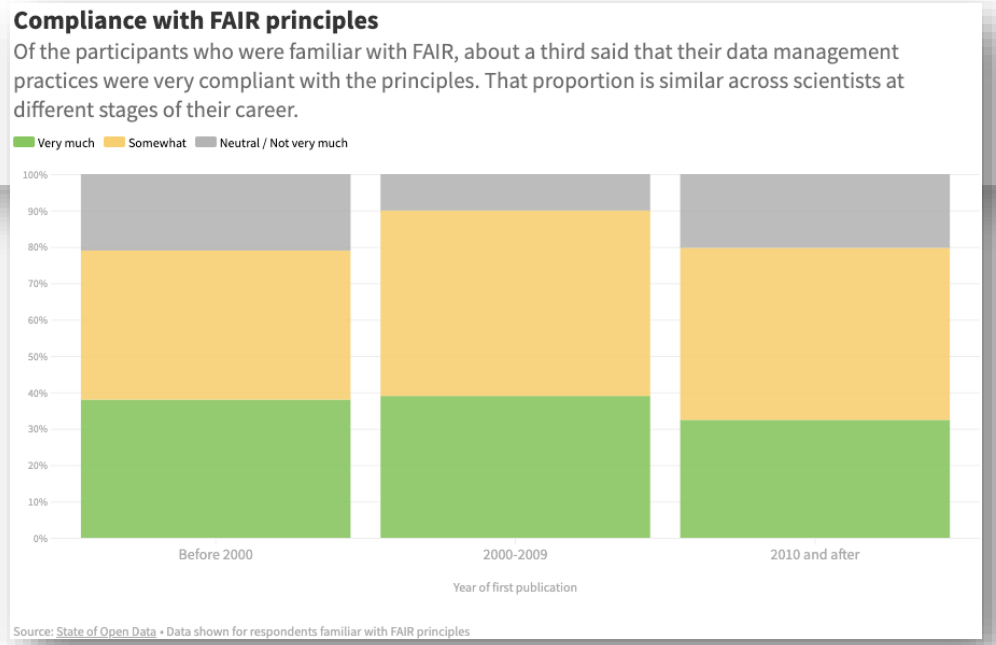
Researchers and FAIR

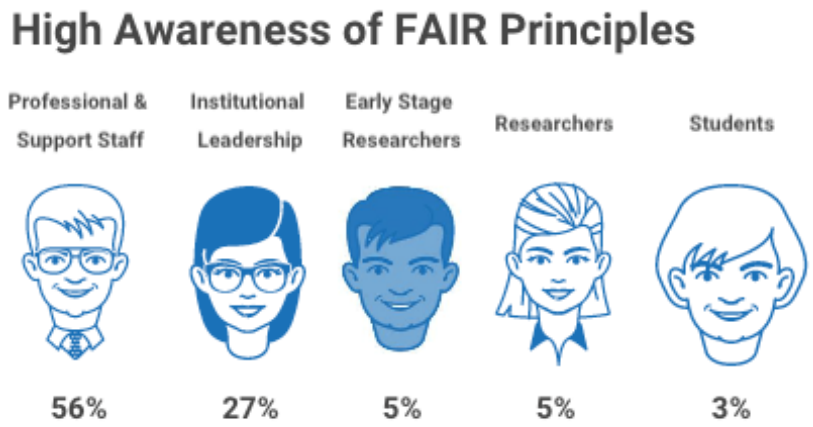


Science, Digital; Fane, Briony; Ayris, Paul; Hahnel, Mark; Hrynaszkiewicz, Iain; Baynes, Grace; et al. (2019): The State of Open Data Report 2019. figshare. Report. https://doi.org/10.6084/m9.figshare.9980783.v2

Researchers and FAIR







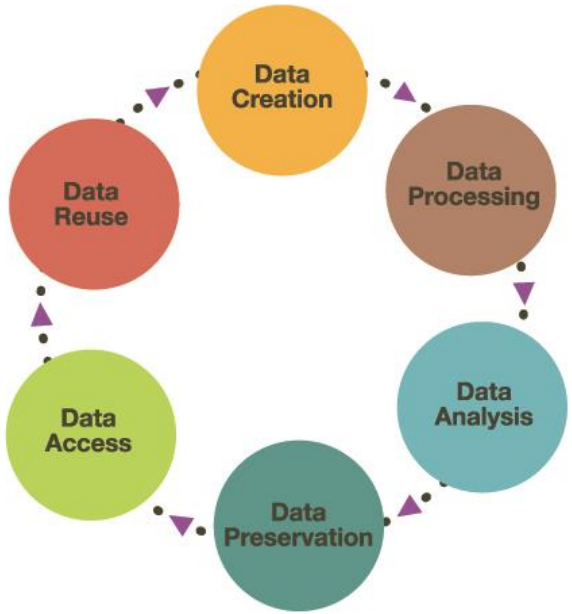
Data Archiving and Networked Services

DANS

https://www.fairsfair.eu/fair-european-higher-education

The concept of FAIR: what does it really mean?

Responsible management of your data !?



FAIR principles

- Focus on the data and metadata
- Provides a “snapshot” of a digital object in isolation of its context

Data sharing a FAIRytale?

"Research data will not become nor stay FAIR by magic. We need skilled people, transparent processes, interoperable technologies and collaboration to build, operate and maintain research data infrastructures."

Mari Kleemola,

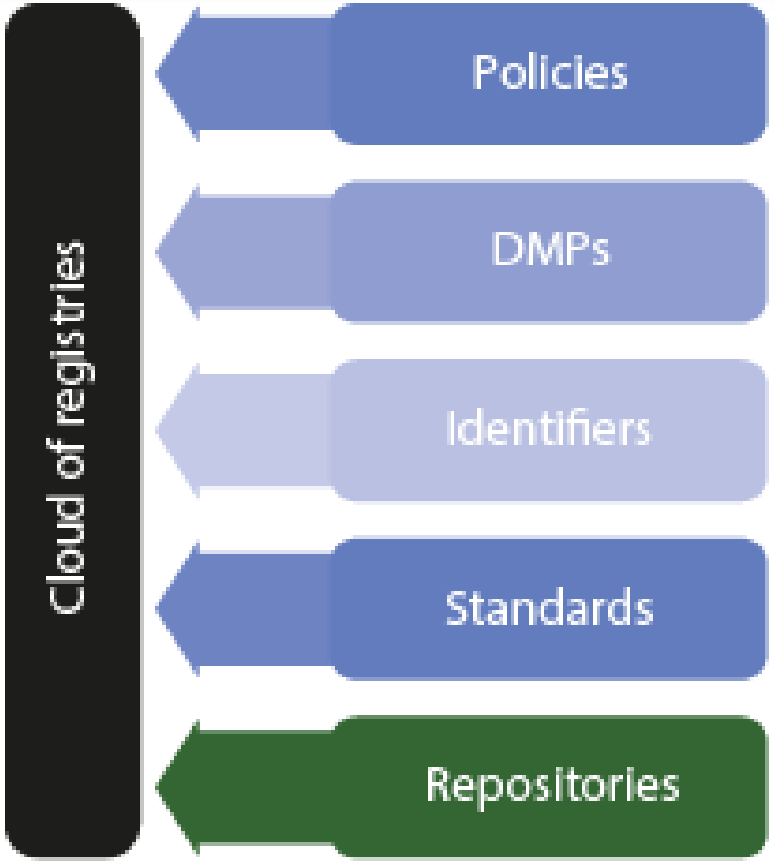
CoreTrustSeal Board

https://tietoarkistoblogi.blogspot.com/2018/11/being-trustworthy-and-fair.html

FAIR Data Ecosystem

- **F1.** (meta)data are assigned a globally unique and persistent **identifier**
- **F4.** (meta)data are registered or indexed in a **searchable resource**

- **A1.** (meta)data are retrievable by their identifier using a **standardized communications protocol**
- **A1.2** the protocol allows for an **authentication and authorization** procedure, where necessary
- **A2.** metadata are accessible, even when the **data are no longer available**



Turning FAIR data into reality, Final report and Action Plan from the European Commission Expert Group on FAIR Data https://doi.org/10.2777/54599

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FAIR data

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Repository certification


“Perhaps the biggest challenge in sharing data is trust: how do you create a system robust enough for scientists to trust that, if they share, their data won’t be lost, garbled, stolen or misused?”
The Data Harvest:
How sharing research data can yield knowledge, jobs and growth
An RDA Europe Report
December 2014

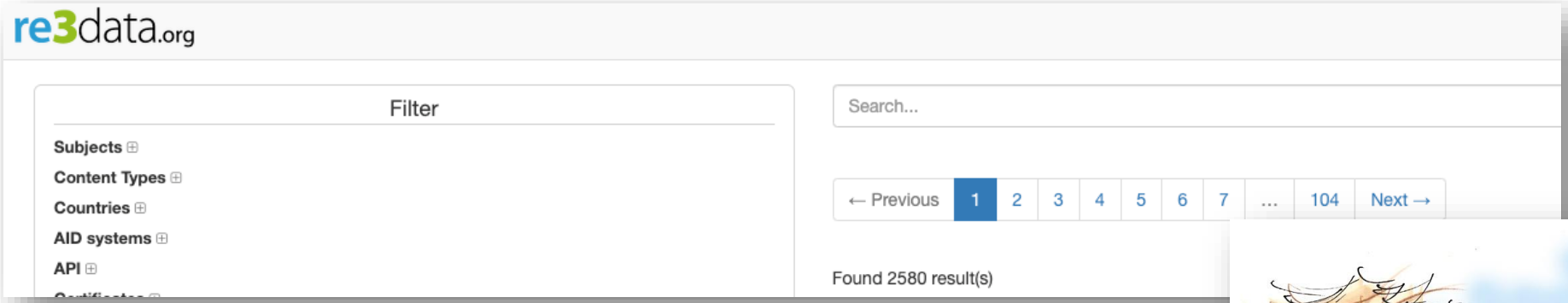
Importance of sustainable data infrastructure

”36% of respondents have lost data on which they were working and there is, unsurprisingly, a high correlation between the vehicle for storing data and where it was lost - computer hard drives were the most common culprit here.”

Science, Digital; Hahnel, Mark; Treadway, Jon; Fane, Briony; Kiley, Robert; Peters, Dale; et al. (2017): The State of Open Data Report 2017. figshare. Paper.

https://doi.org/10.6084/m9.figshare.5481187.v1

Where to store your data? And whom should you trust?



https://www.re3data.org

A matter of TRUST: principles to **keep** data FAIR

•Discussion of a TRUST White Paper at two RDA plenaries

•Community consultation resulting in 200+ public comments

•19 co-authors representing:
- 4 continents, 8 countries
- Diverse stakeholders: funders, publishers, librarians, standards experts, preservation specialists
- Multiple domains: social sciences, biomedical sciences, geosciences, etc.

High level principles to facilitate stakeholder discussion and guide repositories

The TRUST principles

The TRUST Principles

Principle	Guidance for Repositories
Transparency	To be transparent about specific repository services and data holdings that are verifiable by publicly accessible evidence.
Responsibility	To be responsible for ensuring the authenticity and integrity of data holdings and for the reliability and persistence of its service.
User Focus	To ensure that the data management norms and expectations of target user communities are met.
Sustainability	To sustain services and preserve data holdings for the long-term.
Technology	To provide infrastructure and capabilities to support secure, persistent, and reliable services.

Source: Lin et al., 2020. The TRUST Principles for Digital Repositories. Scientific Data https://doi.org/10.1038/s41597-020-0486-7

The TRUST principles

READ

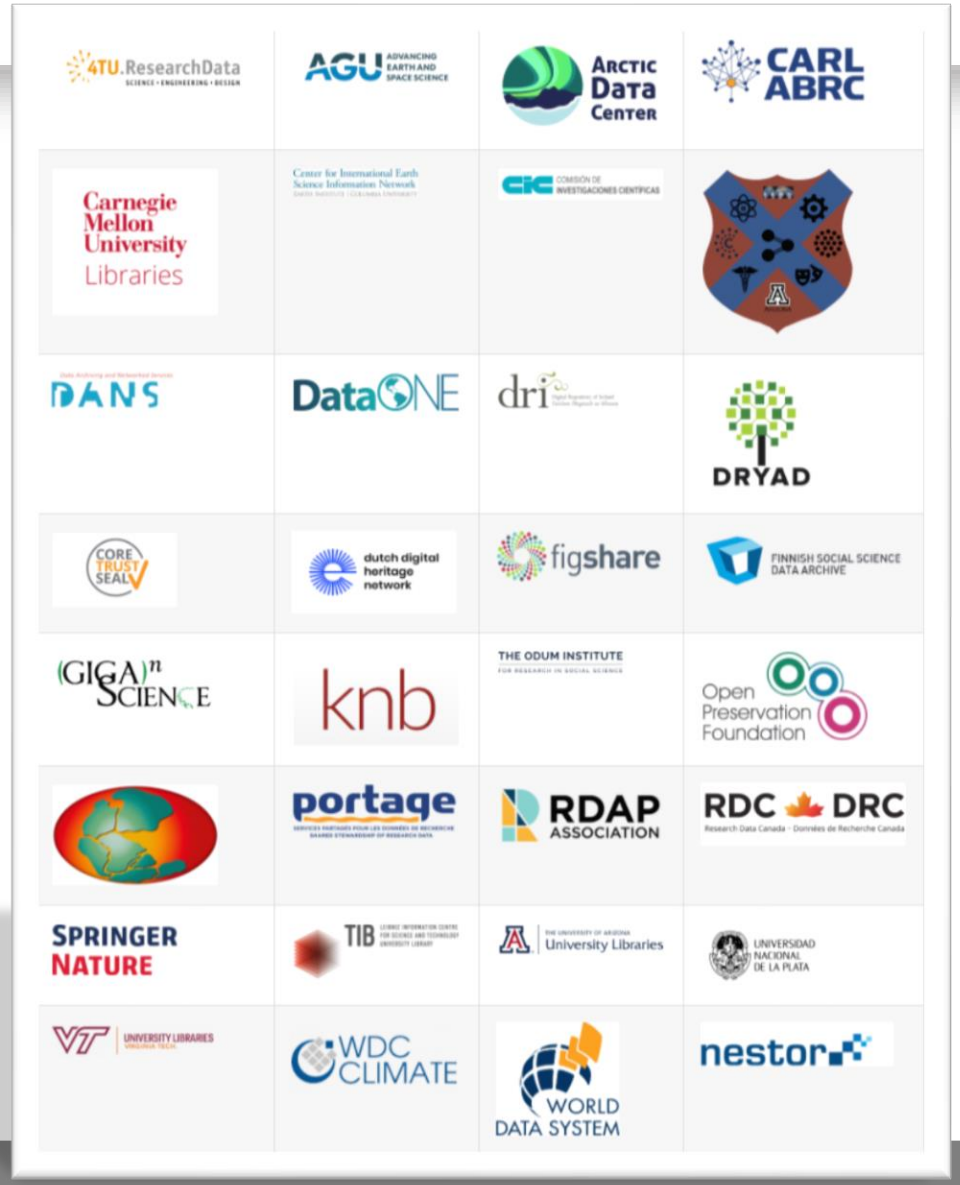
The TRUST Principles for digital repositories
https://doi.org/10.1038/s41597-020-0486-7

ENDORSE

https://www.rd-alliance.org/rda-community-effort-trust-principles-digital-repositories

CONTRIBUTE

RDA Interest Group Certification: TRUST principles to be discussed at RDA Plenary 16



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Trusting digital repositories

- actions and attributes of the trustee (integrity, transparency, competence, predictability, guarantees, positive intentions)

- external acknowledgements:
  - reputation (researchers)
  - third party endorsements (funders, publishers)

CoreTrustSeal

- Community driven repository certification
- Developed under the umbrella of RDA

- 16 requirements, reflecting the characteristics of TRUSTworthy Data Repositories (TDRs)
- Minimal (core) standard

- Peer review, 3 year cycle, transparent processes
- Global uptake, discipline agnostic

https://www.coretrustseal.org

CoreTrustSeal

- Gives **data producers** assurance that data are preserved and remain reusable (i.e. FAIR) in the future;
- Provides **funding bodies** confidence that investments are maximized;
- Enables **data consumers** to choose the repositories where data are held;
- Supports **repositories** to improve their processes.

CoreTrustSeal requirements

Categories:

- Background information (R0)
- Organizational infrastructure (R1-6)
- Digital object management (R7-14)
- Technology and security (R15-16)

- Applicant feedback

Certification process

Self assessment based on 16 Requirements (written responses + URLs of documented public evidence + compliance level)

Peer review by two expert and independent reviewers under the responsibility of the CoreTrustSeal Standards and Certification Board

- Online tool
- Administrative fee of 1,000 euro
- Successful applications are made publicly available
- Certification valid 3 years

Library of public applications; all are certified and so can be considered exemplars.

Perceived benefits

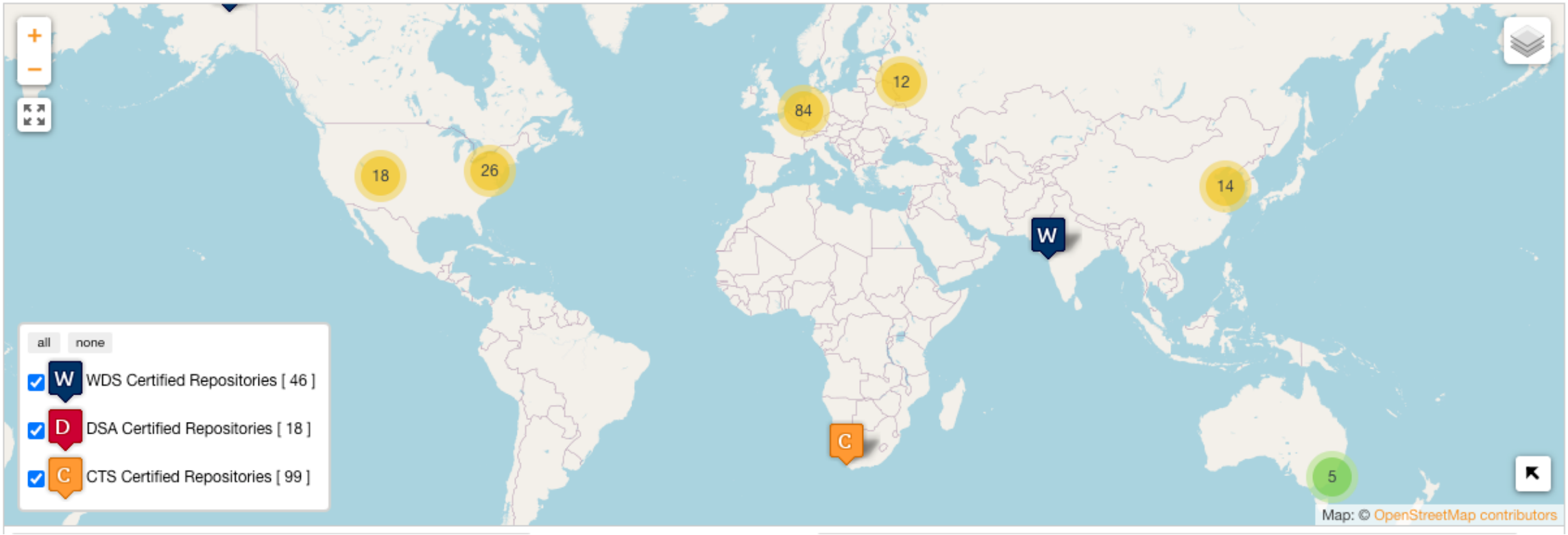
External:

- Displays commitment to data and service quality and long-term data curation
- Heightens stakeholder confidence
- Increases national and international recognition and reputation
- Increases your visibility
- Show data holdings and services are searchable, accessible, and satisfy national and international standards

Internal:

- Benchmark for comparison/ determine strengths and weaknesses
- Improves professionalism:
  - Checking, improving and updating policy and workflow documents
  - Re-evaluating and making improvements on our technical solutions and processes for long-term preservation
- Improves awareness and compliance with established standards
- Increases internal communication
- Good team building exercise
- Ensuring transparency

CoreTrustSeal uptake



Current situation in LAC countries

- 32 repositories registered in the Re3Data registry
- No CTS certified trustworthy digital repositories yet

TDR to guarantee a baseline of FAIRness

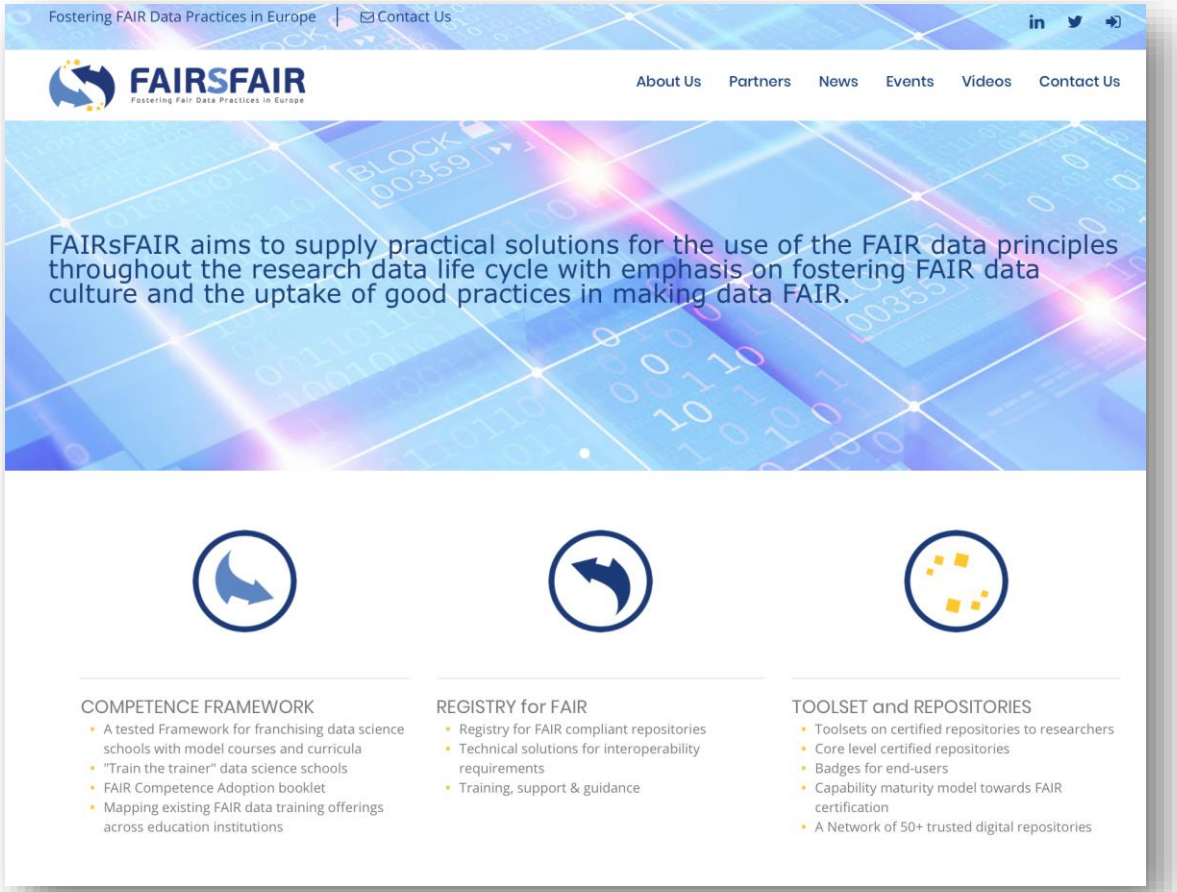
Majority of CoreTrustSeal requirements (indirectly) refer to the FAIRness of the repository holdings

Baseline of data FAIRness, but:

Some data will be more FAIR than others

We need more assessment mechanisms for in the FAIR ecosystem

European FAIRsFAIR project



supplying **practical solutions** for the use of the FAIR data principles throughout the research data life cycle;

fostering **FAIR data culture** and the uptake of good practices in making data FAIR;

- 10 million euro
- 36 months
- Starting date: March 1 2019
- 22 partners from 8 European countries

https://www.fairsfair.eu/

FAIRsFAIR results

Wp1	Project Management and Sustainability
Wp2	FAIR Practices: Semantics, Interoperability, and Services
Wp3	FAIR Policy and Practice
Wp4	FAIR Certification
Wp5	Engagement, Communication and Uptake
Wp6	FAIR Competence Centre
Wp7	FAIR Data Science and Professionalisation

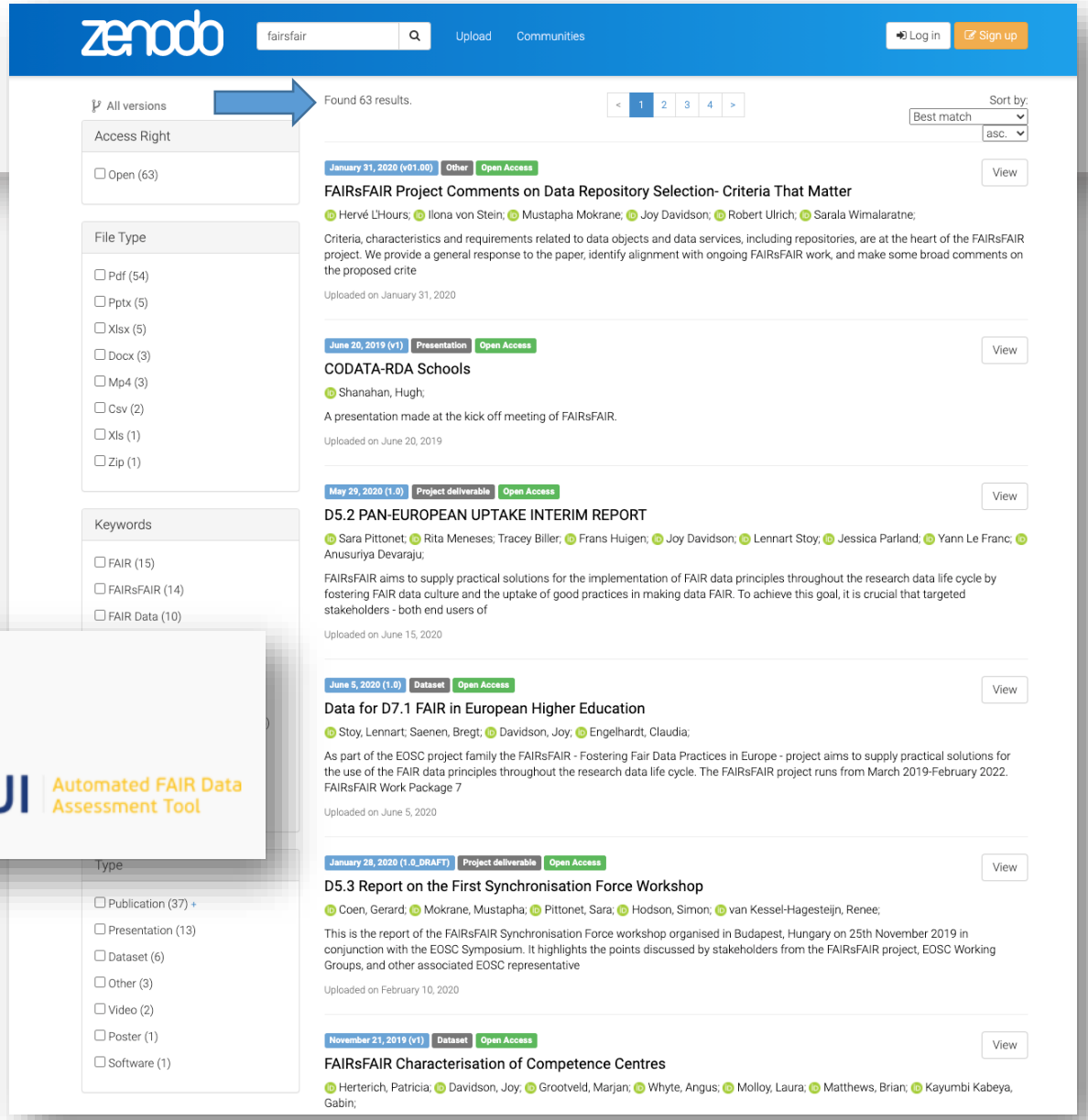
Software & Tools

FAIR Aware

FAIR Data Object Assessment Metrics

F-UJI Automated FAIR Data Assessment Tool

Stay tuned:
https://www.fairsfair.eu/user/register



https://zenodo.org/search?page=1&size=20&q=fairsfair

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https://www.rd-alliance.org/plenaries/rda-16th-plenary-meeting-costa-rica

RDA 16th Plenary - Pathways

Home » VP16; P16; Plenary 16; Pathways » RDA 16th Plenary - Pathways

20 October 2020 | 177 reads | Facebook | Twitter

Plenary 16 Information

Welcome to the RDA Plenary Pathways for P16!

Find your breakout session by theme.

The Plenary Pathways are the result of a joint effort between TAB and OA to provide a guide through the rich diversity of topics that the plenary presents. As such, they are meant to enhance the plenary experience rather than constrain, to highlight convergences, and to propose divergences you may not have considered. We hope you find them useful.

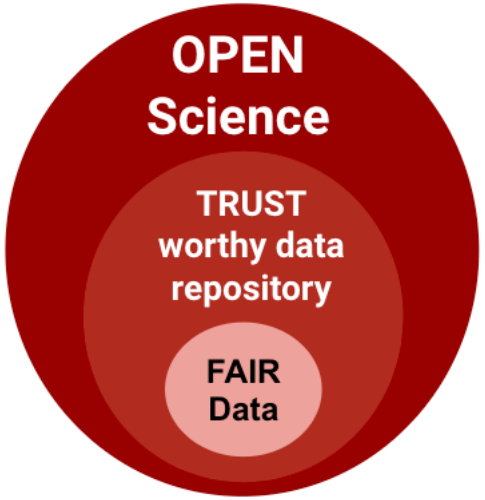
Please find the Pathways below:

- COVID-19 / Infectious Diseases
- The Data Life Cycle, Versioning, Provenance, and Reuse
- Research Software
- Data Management Practices
- Skills and Human Capacity Development
- The FAIR Agenda

Main takeways

- We need to share our data in order to turn open science into a reality;
- The **FAIR** principles help us to define high quality and transparent research data management practices;
- Certification mechanisms, like CoreTrustSeal for digital repositories, help us to create **TRUST** in the research data infrastructure we need in order to safeguard the accessibility and assessibility of our (FAIR) data for the future.

FAIR and TRUST
a perfect couple



Thank you for listening!

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