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Open Science in Horizon Europe

6th International PhD Summer School

13 Jul 2022 | KTU | Lithuania

eva.hnatkova@techlib.cz

Overview

- Evolution of OS policies across FPs
- OS Policy in Horizon Europe
- Open Research Europe (ORE)
- European Open Science Cloud (EOSC)

Open Science - “modus operandi”

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Horizon Europe

THE NEXT EU RESEARCH & INNOVATION PROGRAMME (2021 – 2027)

European Commission

€95.5 billion

The Evolution of OS policies across FPs

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2008

FP7

OA **Pilot**

Deposit and open access

2014

H2020

OA **Mandatory**

Deposit and open access

& ORD/DMP **Pilot**

2017

H2020

OA **Mandatory**

Deposit and open access

& ORD/DMP **by default (exceptions)**

2021

Horizon Europe

OA **Mandatory**
Deposit and open access

DMP in line with FAIR **Mandatory**

OD **by default (exceptions)**

& Open Science **embedded**

Open Science in Horizon Europe

Open Science

Mainstreaming of open science practices for improved quality and efficiency of R&I, and active engagement of society

Mandatory immediate Open Access to publications: beneficiaries must retain sufficient IPRs to comply with open access requirements;

Data sharing as 'open as possible, as closed as necessary': mandatory Data Management Plan for FAIR (Findable, Accessible, Interoperable, Reusable) research data

- Work Programmes may incentivize or oblige to adhere to **open science practices** such as involvement of citizens, or to use the **European Open Science Cloud**
- Assessment of open science practices through the **award criteria** for proposal evaluation
- Dedicated support to **open science policy actions**
- **Open Research Europe** publishing platform

European Commission

OPEN SCIENCE

Open science - An approach to the scientific process based on open cooperative work, tools and diffusing knowledge.

Open access - Online access to research outputs provided free of charge to the end-user.

OPEN ACCESS TO PUBLICATIONS

The beneficiaries must ensure OA to **peer-reviewed scientific publications** relating to their results.

- **at the latest at the time of publication**, a machine-readable electronic copy of **the published version**, or the **final peer-reviewed manuscript** accepted for publication, **is deposited in a *trusted repository*** for scientific publications
- **immediate OA** is provided to the deposited publication via the repository **NO EMBARGO**
- must **retain sufficient Intellectual Property Rights (IPRs)** to comply with the open access requirements

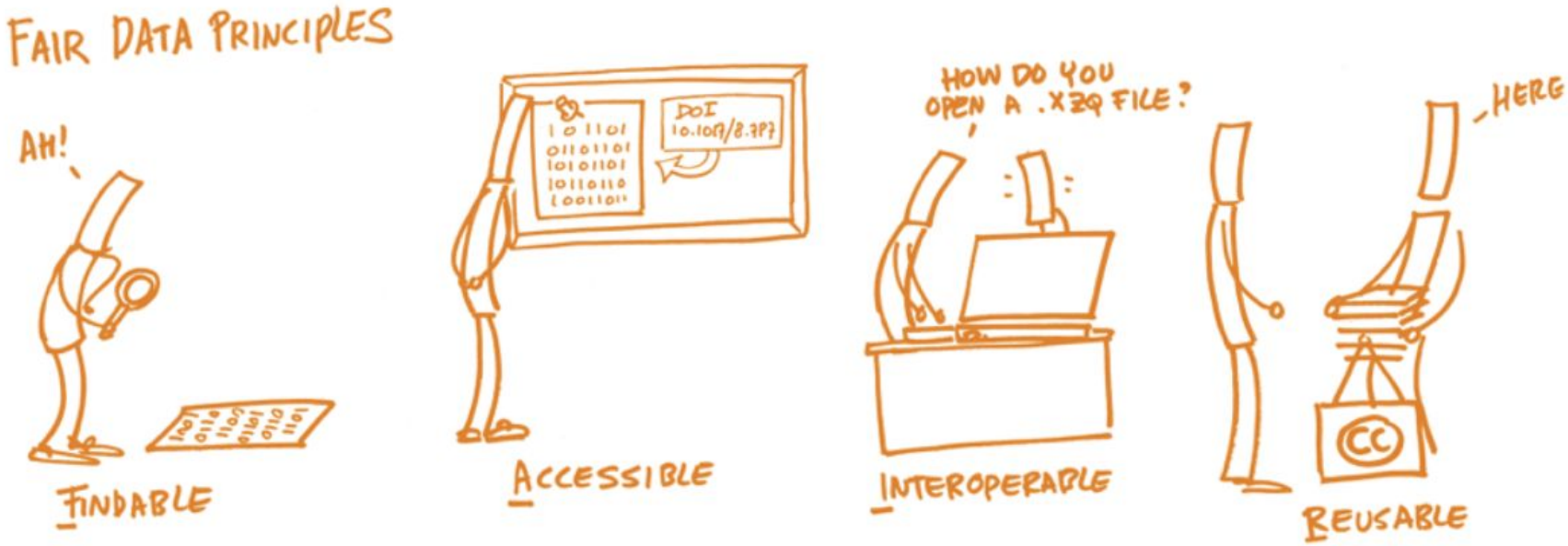
OPEN RESEARCH DATA

„As open as possible, as closed as necessary.“

OPEN UNLESS:

- be against the beneficiary’s **legitimate interests**, including regarding commercial exploitation, or
- be **contrary to any other constraints**, in particular the EU competitive interests or the beneficiary’s obligations under this Agreement; if open access is not provided (to some or all data), this must be justified in the DMP

RESEARCH DATA

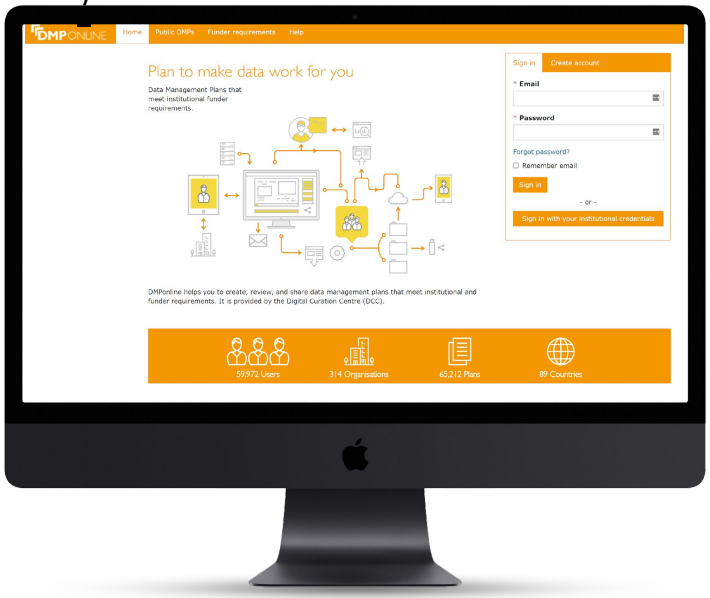


https://www.go-fair.org/fair-principles/

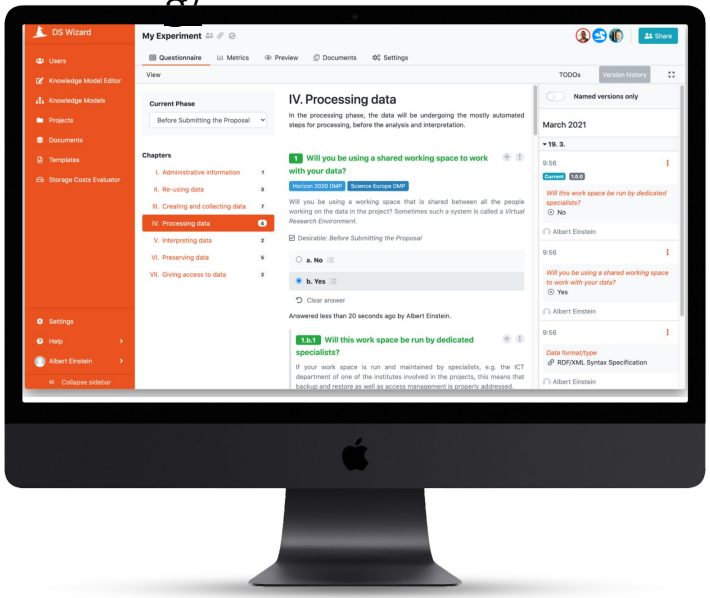
Publications | Data

DATA MANAGEMENT PLAN (M6)

https://dmponline.dcc.ac.uk/



https://ds-wizard.org/



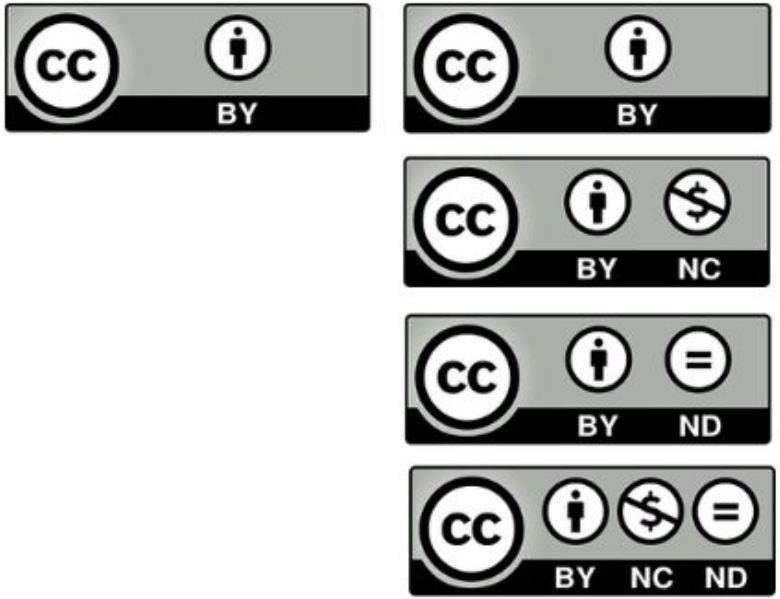
HE TEMPLATE

Source: Slides from Aneta Kašlíková on MSCA Postdoctoral Fellowships 2022 (TC AV ČR)

Licences

Articles

Datasets



Monographs and other long text formats

Metadata

For deposited publications and datasets must provide at least:

- author(s), publication/datasets title, publication date and venue;
- Horizon Europe or Euratom funding;
- grant project name, acronym and number;
- licensing terms;
- **persistent identifiers** (PIDs) for the publications (DOI) and datasets (DOI), the authors (ORCID), if possible, for their organisations and the grant.
- Where applicable, include PIDs for any research output or any other tools and instruments needed to validate the conclusions of the publication.

Open Science in Horizon Europe

For detailed descriptions and resources on OS see the:

- Horizon Europe Annotated Model Grant Agreement (AGA) annex 5 (p.151 - 160)
- Horizon Europe programme guide Chapter 16 (p.37-53)
- Horizont Europe DMP template

Evaluation of proposals and Open Science

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"Excellence" criterion

(methodology)

- Evaluation of the quality of open science practices

- Up to 1 page to describe OS practices + up to 1 page to describe research data/output management

"Quality and efficiency of implementation" criterion

(capacity of participants and consortium as a whole + list of achievements)

- Explain expertise on OS

- List publications, software, data, etc, relevant to the project with qualitative assessment and, where available, persistent identifiers

Publications are expected to be open access; datasets are expected to be FAIR and 'as open as possible, as closed as necessary'. **Significance of publications to be evaluated on the basis of proposers' qualitative assessment** and not per Journal Impact Factor

Exceptions: ERC + some EIC programmes for now evaluate OS practices under impact

OPEN SCIENCE IN MSCA PF PROJECT PROPOSAL

Part B-1

For guidance on open science practices and research data management, please refer to the relevant section of the HE Programme Guide.

1.2 Soundness of the proposed methodology *(including interdisciplinary approaches, consideration of the gender dimension and other diversity aspects if relevant for the research project,* ***and the quality of open science practices****)*

Open science practices: **Describe how appropriate open science practices are implemented as an integral part of the proposed methodology**. Show how the choice of practices and their implementation is adapted to the nature of your work in a way that will increase the chances of the project delivering on its objectives [e.g. up to ½ page, including research data management]. If you believe that none of these practices are appropriate for your project, please provide a justification here.

Open science is an approach based on open cooperative work and systematic sharing of knowledge and tools as early and widely as possible in the process. Open science practices include early and open sharing of research (for example through preregistration, registered reports, pre-prints, or crowd-sourcing); research output management; measures to ensure reproducibility of research outputs; providing open access to research outputs (such as publications, data, software, models, algorithms, and workflows); participation in open peer-review; and involving all relevant knowledge actors including citizens, civil society and end users in the co-creation of R&I agendas and contents (such as citizen science).

Please note that this does not refer to outreach actions that may be planned as part of the communication, dissemination and exploitation activities. These aspects should instead be described below under 'Impact'.

Research data management and management of other research outputs: Applicants generating/collecting data and/or other research outputs (except for publications) during the project must explain how the data will be managed in line with the FAIR principles (Findable, Accessible, Interoperable, Reusable).

Source: Slides from Aneta Kašlíková on MSCA Postdoctoral Fellowships 2022 (TC AV ČR)

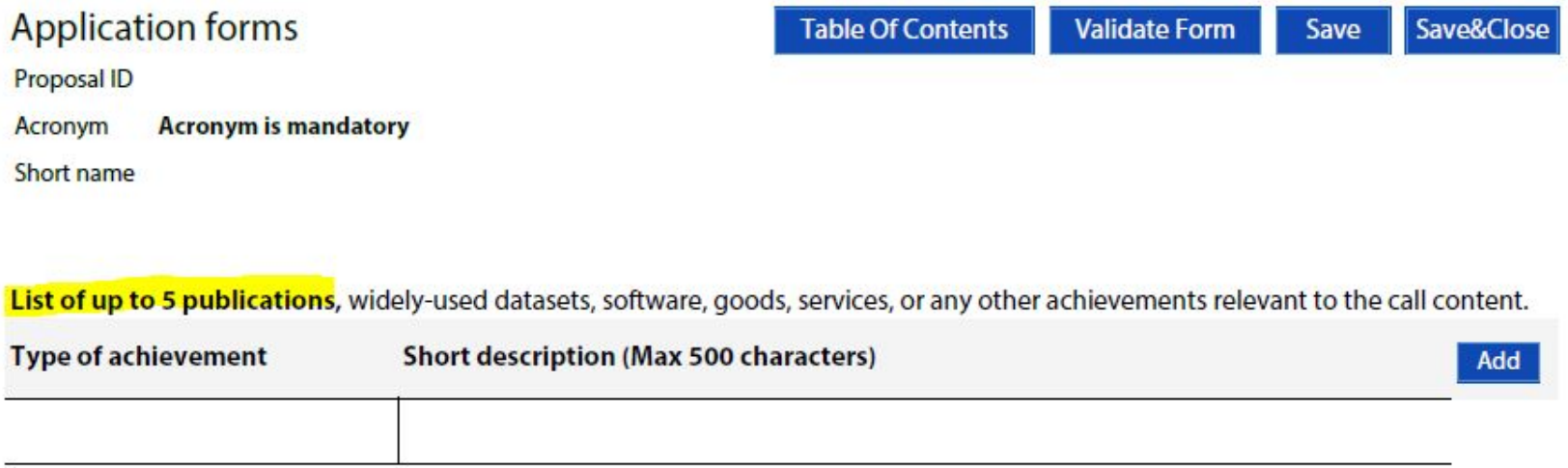
OPEN SCIENCE PRACTICES

What?	How?	Mandatory in all calls/recommended
Early and open sharing of research	Preregistration, registered reports, preprints etc.	Recommended
Research output management	Manage responsibly in line with FAIR (including a management plan)	• **Mandatory** for research data • Recommended for research outputs other than publications and research data
Measures to ensure reproduciblity of research outputs	Information on outputs/tools/instruments & access to data/results for validation of publications	**Mandatory**
Open access to research outputs through deposition in trusted repositories	• Open access to publications • Open access to data • Open access to software, models, algorithms, workflows etc.	• **Mandatory** for peer-reviewed publications • **Mandatory** for research data **but** with exceptions (‘as open as possible…’) • Recommended for other research outputs
Participation in open peer-review	Publishing in open peer-reviewed journals or platforms	Recommended
Involving all relevant knowledge actors	Involvement of citizens, civil society and end-users in co-creation of content (e.g. crowd-sourcing, etc.)	Recommended

Source: Slides from Aneta Kašlíková on MSCA Postdoctoral Fellowships 2022 (TC AV ČR)

OPEN SCIENCE IN MSCA PF PROJECT PROPOSAL

ADMINISTRATIVE FORMS



Source: Slides from Aneta Kašlíková on MSCA Postdoctoral Fellowships 2022 (TC AV ČR)

OPEN SCIENCE IN MSCA PF PROJECT PROPOSAL

Part B2

The CV should include information on:

Publications in peer-reviewed scientific journals, peer-reviewed conference proceedings, and/or monographs (**they are expected to be open access either published or through repositories**) and **other outputs** such as data, software, algorithms significant for your research path (**they are expected to be open access in appropriate repositories** to the extent possible;

they should be accompanied by a very short qualitative assessment of their scientific significance and **NOT by the Journal Impact Factor**);

...

Source: Slides from Aneta Kašlíková on MSCA Postdoctoral Fellowships 2022 (TC AV ČR)

Open Research Europe (ORE)

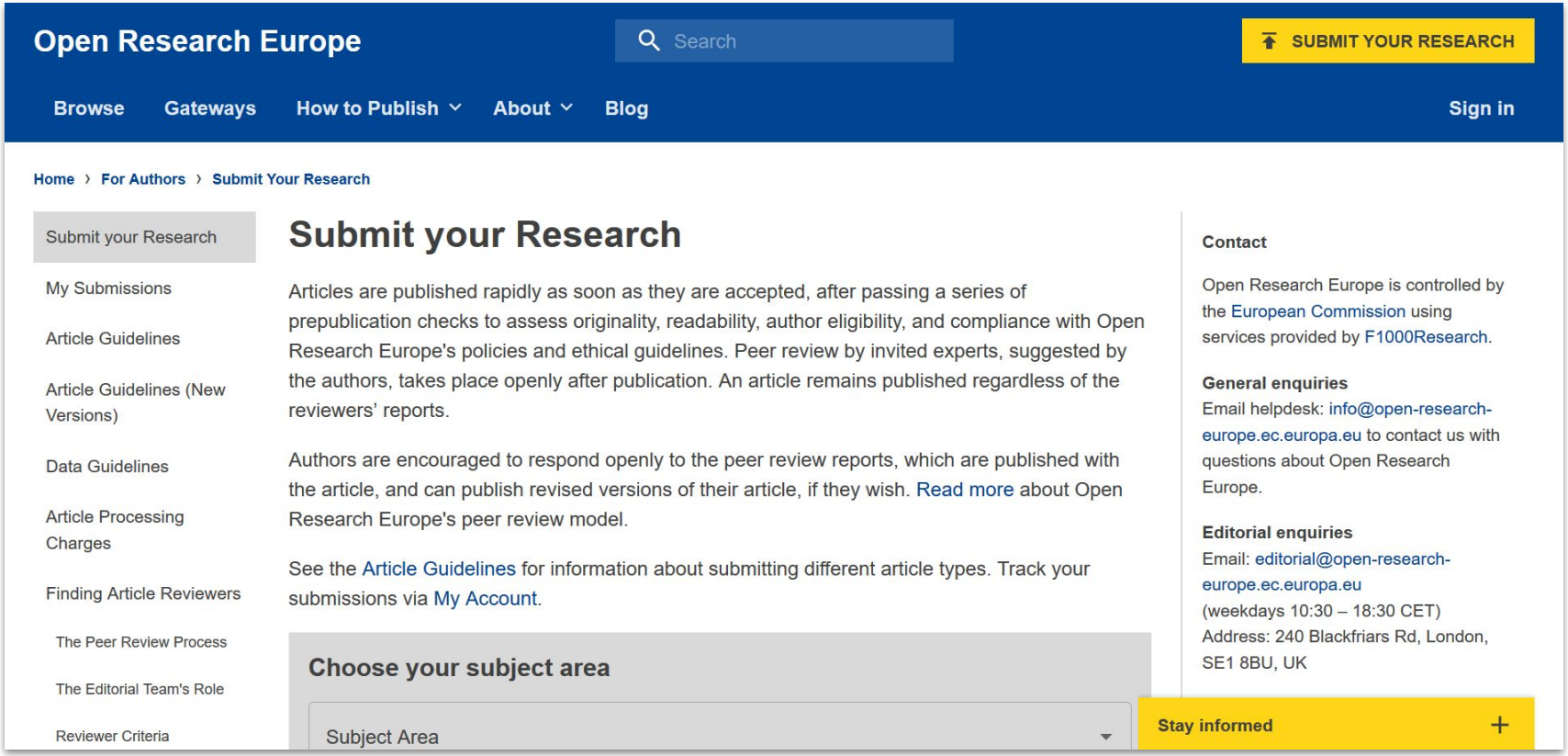
OA Publishing Platform for H2020 & HEU research results

- Initiative of EC
- By F1000 Research
- Immediate OA
- Open/FAIR Data support
- Open Peer Review
- NO author fee
- All disciplines
- Article-level metrics
- **Indexed in Scopus**

Launched in March 2021

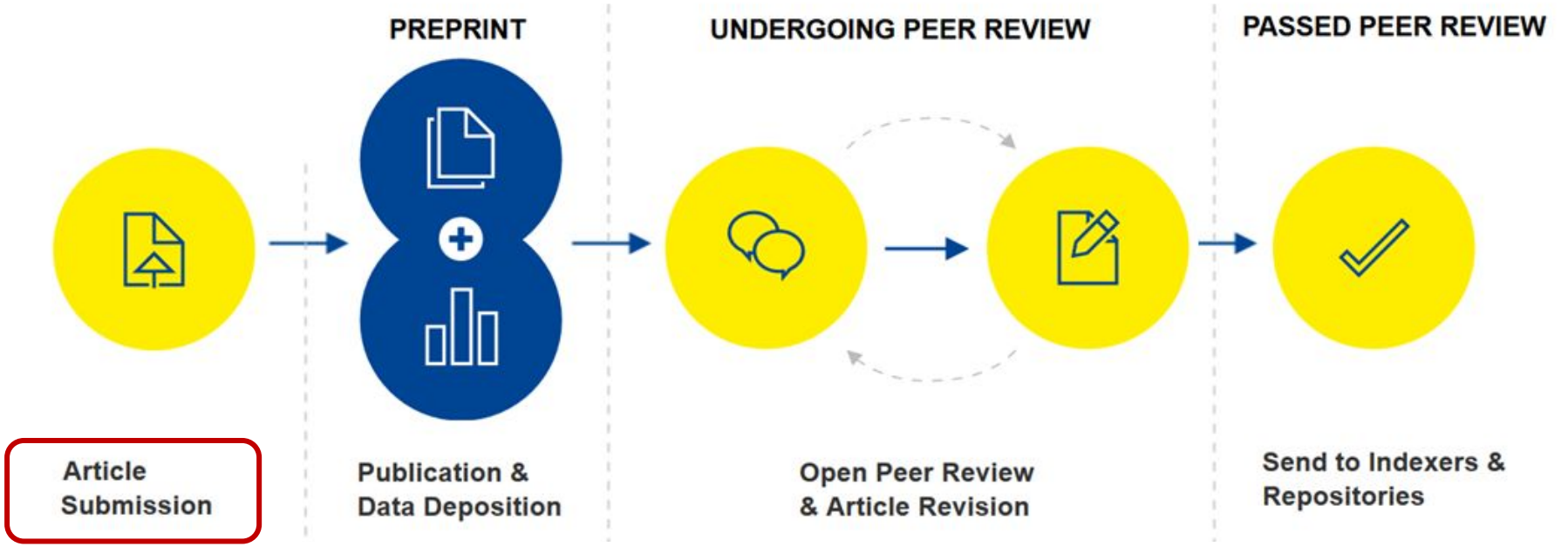
https://open-research-europe.ec.europa.eu/

Open Publishing Platform via ORE



ORE Publishing Platform | Science Business article on ORE

ORE Publishing Model



Prepublication checks

Upon Submission

- Assess author eligibility
- Check article scope
- Check for plagiarism

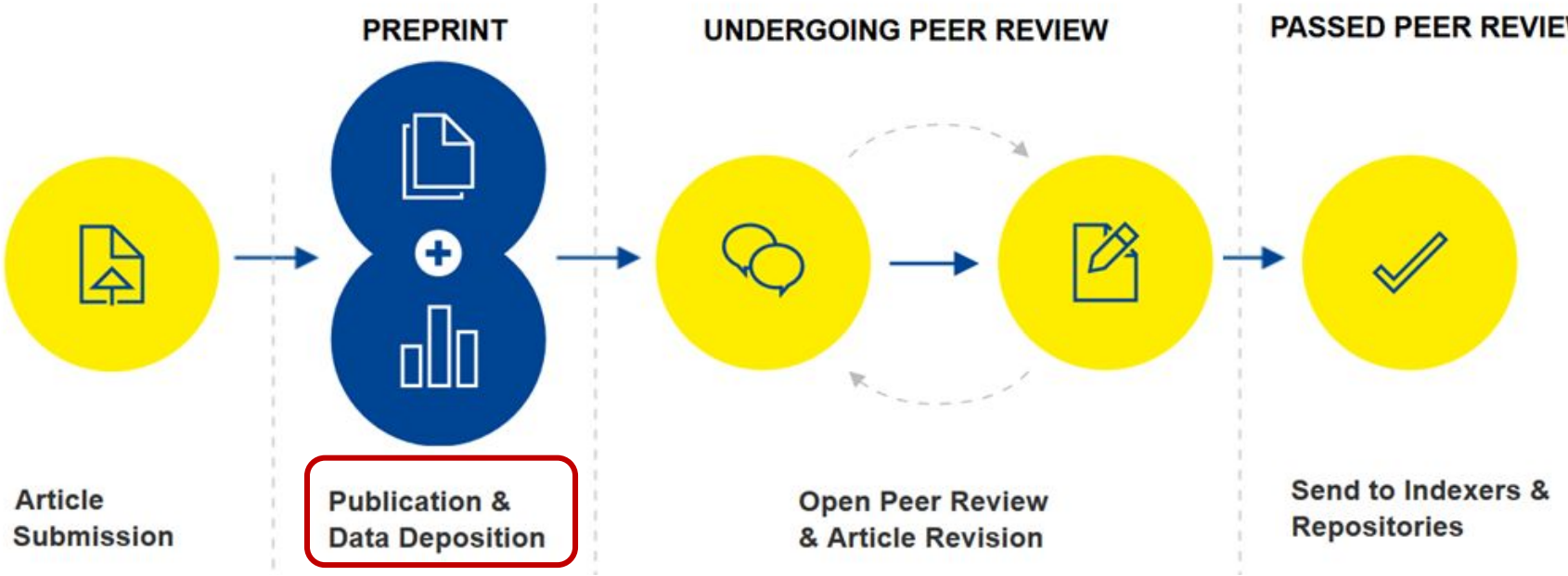
Pre-publication Checks

- Comprehensive checks on reporting, editorial & ethical guidelines
- Check for data availability
- Support authors in making data and software FAIR

Production

- Converted to text and data-mining formats (PDF, HTML, XML)
- Proofs and editing if necessary
- Quality checks on citations, references, image resolutions & multimedia
- Ensure persistent identifiers are assigned and resolve correctly

Open Research Publishing Model



Data and Software Availability

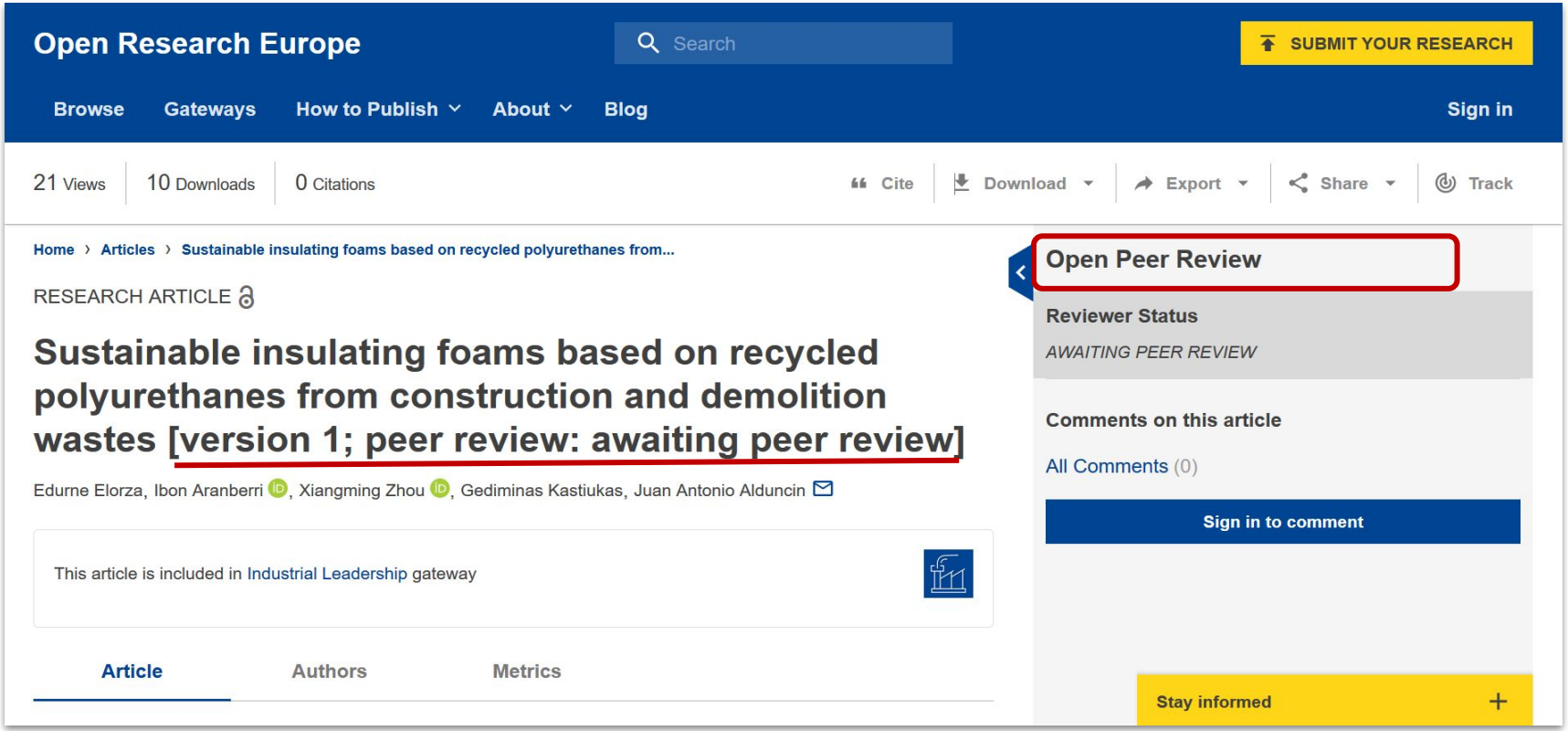
ORE requires that, where possible, the source data underlying the results are made available at publication.

However, the sharing of research data **must**:

- Protect the confidentiality, security and privacy of individuals
- Respect the terms of consent by individuals who are involved in research
- Be consistent with H020/HEU legal, ethical and regulatory frameworks
- Guard against unreasonable costs

https://open-research-europe.ec.europa.eu/for-authors/data-guidelines

Pre-publication (example)



https://open-research-europe.ec.europa.eu/articles/1-37

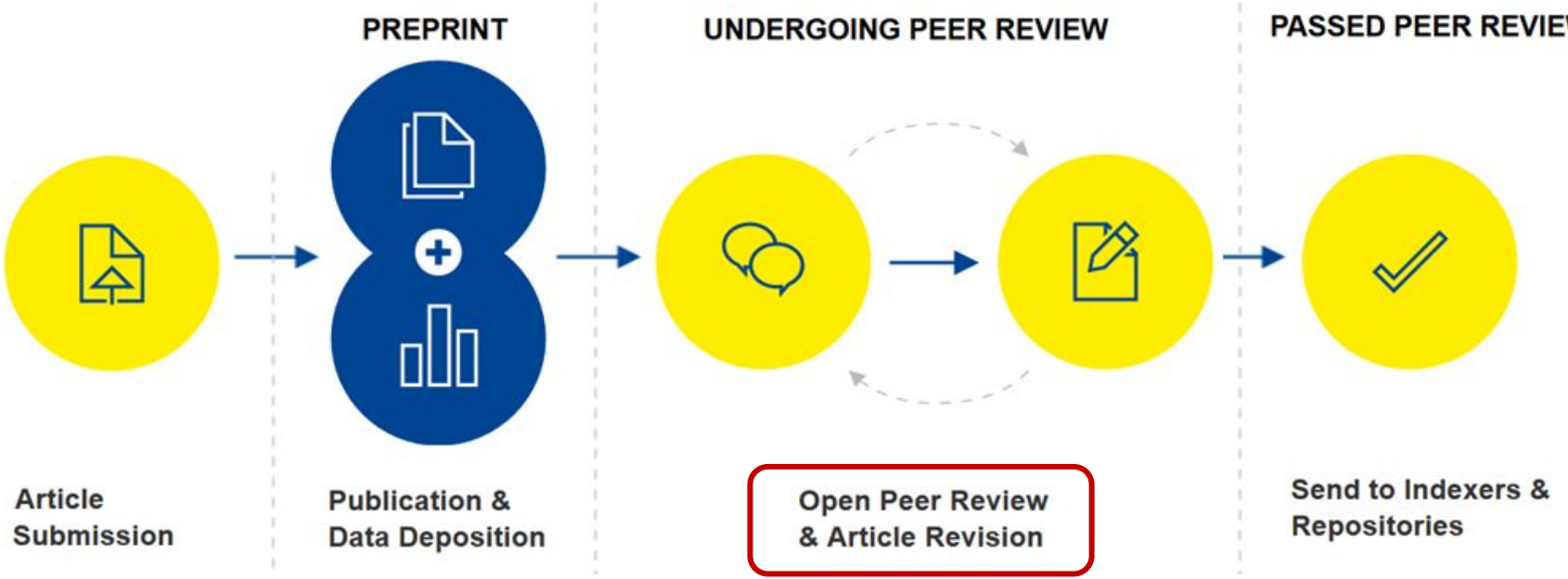
Data availability statement

Data availability

Dataset including full data files used for analysis in this review: http://doi.org/10.5281/zenodo.438024 (Ross-Hellauer, 2017).

https://f1000research.com/articles/9-449

Publishing Model



Open Peer Review

Open identities

- Reviewers must provide name and affiliation
- Must identify conflicting interests

Open reports

- Reviewer reports will be published alongside the article
- these are citable and have viewing metrics

Open review status

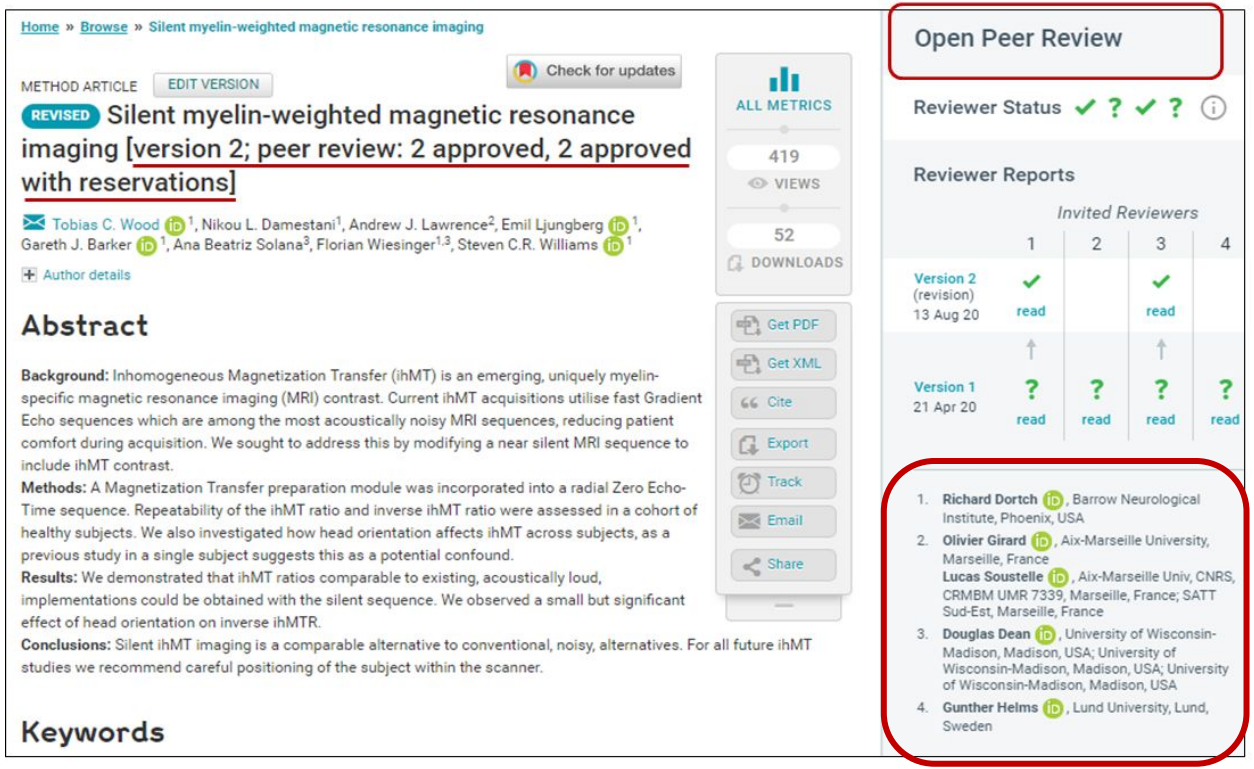
- Reviewers assign a status

APPROVED
The paper is scientifically sound in its current form and only minor, if any, improvements are suggested

APPROVED WITH RESERVATIONS
Key revisions are required to address specific details and make the paper fully scientifically sound

NOT APPROVED
Fundamental flaws in the paper seriously undermine the findings and conclusions

Open Peer Review example



Alongside their report, reviewers assign a status to the article:

APPROVED
The paper is scientifically sound in its current form and only minor, if any, improvements are suggested

APPROVED WITH RESERVATIONS
Key revisions are required to address specific details and make the paper fully scientifically sound

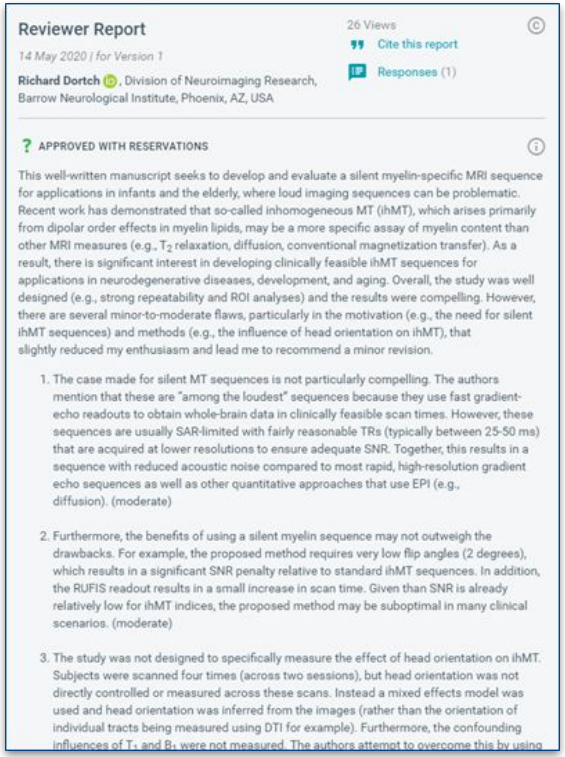
NOT APPROVED
Fundamental flaws in the paper seriously undermine the findings and conclusions

Visibility & credit for reviewers:

- Co-reviewing
- ORCID ids
- DOIs for reports

https://wellcomeopenresearch.org/articles/5-74

Open Peer Review - example 1



Reviewer Report

14 May 2020 | for Version 1

Richard Dortch, Division of Neuroimaging Research, Barrow Neurological Institute, Phoenix, AZ, USA

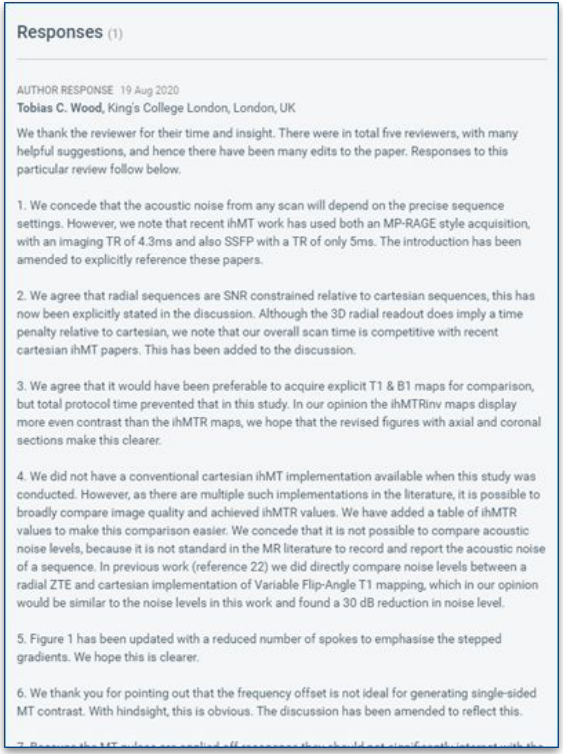
? APPROVED WITH RESERVATIONS

This well-written manuscript seeks to develop and evaluate a silent myelin-specific MRI sequence for applications in infants and the elderly, where loud imaging sequences can be problematic. Recent work has demonstrated that so-called inhomogeneous MT (ihMT), which arises primarily from dipolar order effects in myelin lipids, may be a more specific assay of myelin content than other MRI measures (e.g., T_2 relaxation, diffusion, conventional magnetization transfer). As a result, there is significant interest in developing clinically feasible ihMT sequences for applications in neurodegenerative diseases, development, and aging. Overall, the study was well designed (e.g., strong repeatability and ROI analyses) and the results were compelling. However, there are several minor-to-moderate flaws, particularly in the motivation (e.g., the need for silent ihMT sequences) and methods (e.g., the influence of head orientation on ihMT), that slightly reduced my enthusiasm and lead me to recommend a minor revision.

1. The case made for silent MT sequences is not particularly compelling. The authors mention that these are "among the loudest" sequences because they use fast gradient-echo readouts to obtain whole-brain data in clinically feasible scan times. However, these sequences are usually SAR-limited with fairly reasonable TRs (typically between 25-50 ms) that are acquired at lower resolutions to ensure adequate SNR. Together, this results in a sequence with reduced acoustic noise compared to most rapid, high-resolution gradient echo sequences as well as other quantitative approaches that use EPI (e.g., diffusion). (moderate)

2. Furthermore, the benefits of using a silent myelin sequence may not outweigh the drawbacks. For example, the proposed method requires very low flip angles (2 degrees), which results in a significant SNR penalty relative to standard ihMT sequences. In addition, the RUFIS readout results in a small increase in scan time. Given than SNR is already relatively low for ihMT indices, the proposed method may be suboptimal in many clinical scenarios. (moderate)

3. The study was not designed to specifically measure the effect of head orientation on ihMT. Subjects were scanned four times (across two sessions), but head orientation was not directly controlled or measured across these scans. Instead a mixed effects model was used and head orientation was inferred from the images (rather than the orientation of individual tracts being measured using DTI for example). Furthermore, the confounding influences of T_1 and B_1 were not measured. The authors attempt to overcome this by using



Responses (1)

AUTHOR RESPONSE 19 Aug 2020

Tobias C. Wood, King's College London, London, UK

We thank the reviewer for their time and insight. There were in total five reviewers, with many helpful suggestions, and hence there have been many edits to the paper. Responses to this particular review follow below.

1. We concede that the acoustic noise from any scan will depend on the precise sequence settings. However, we note that recent ihMT work has used both an MP-RAGE style acquisition, with an imaging TR of 4.3ms and also SSFP with a TR of only 5ms. The introduction has been amended to explicitly reference these papers.

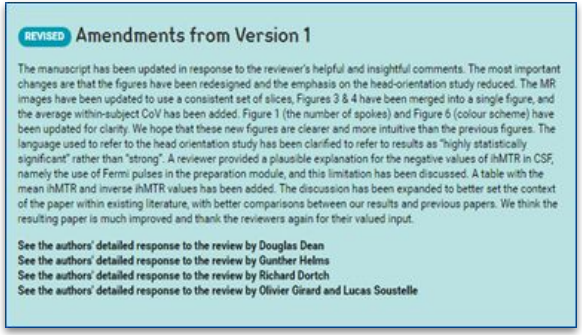
2. We agree that radial sequences are SNR constrained relative to cartesian sequences, this has now been explicitly stated in the discussion. Although the 3D radial readout does imply a time penalty relative to cartesian, we note that our overall scan time is competitive with recent cartesian ihMT papers. This has been added to the discussion.

3. We agree that it would have been preferable to acquire explicit T1 & B1 maps for comparison, but total protocol time prevented that in this study. In our opinion the ihMTRinv maps display more even contrast than the ihMTR maps, we hope that the revised figures with axial and coronal sections make this clearer.

4. We did not have a conventional cartesian ihMT implementation available when this study was conducted. However, as there are multiple such implementations in the literature, it is possible to broadly compare image quality and achieved ihMTR values. We have added a table of ihMTR values to make this comparison easier. We concede that it is not possible to compare acoustic noise levels, because it is not standard in the MR literature to record and report the acoustic noise of a sequence. In previous work (reference 22) we did directly compare noise levels between a radial ZTE and cartesian implementation of Variable Flip-Angle T1 mapping, which in our opinion would be similar to the noise levels in this work and found a 30 dB reduction in noise level.

5. Figure 1 has been updated with a reduced number of spokes to emphasise the stepped gradients. We hope this is clearer.

6. We thank you for pointing out that the frequency offset is not ideal for generating single-sided MT contrast. With hindsight, this is obvious. The discussion has been amended to reflect this.



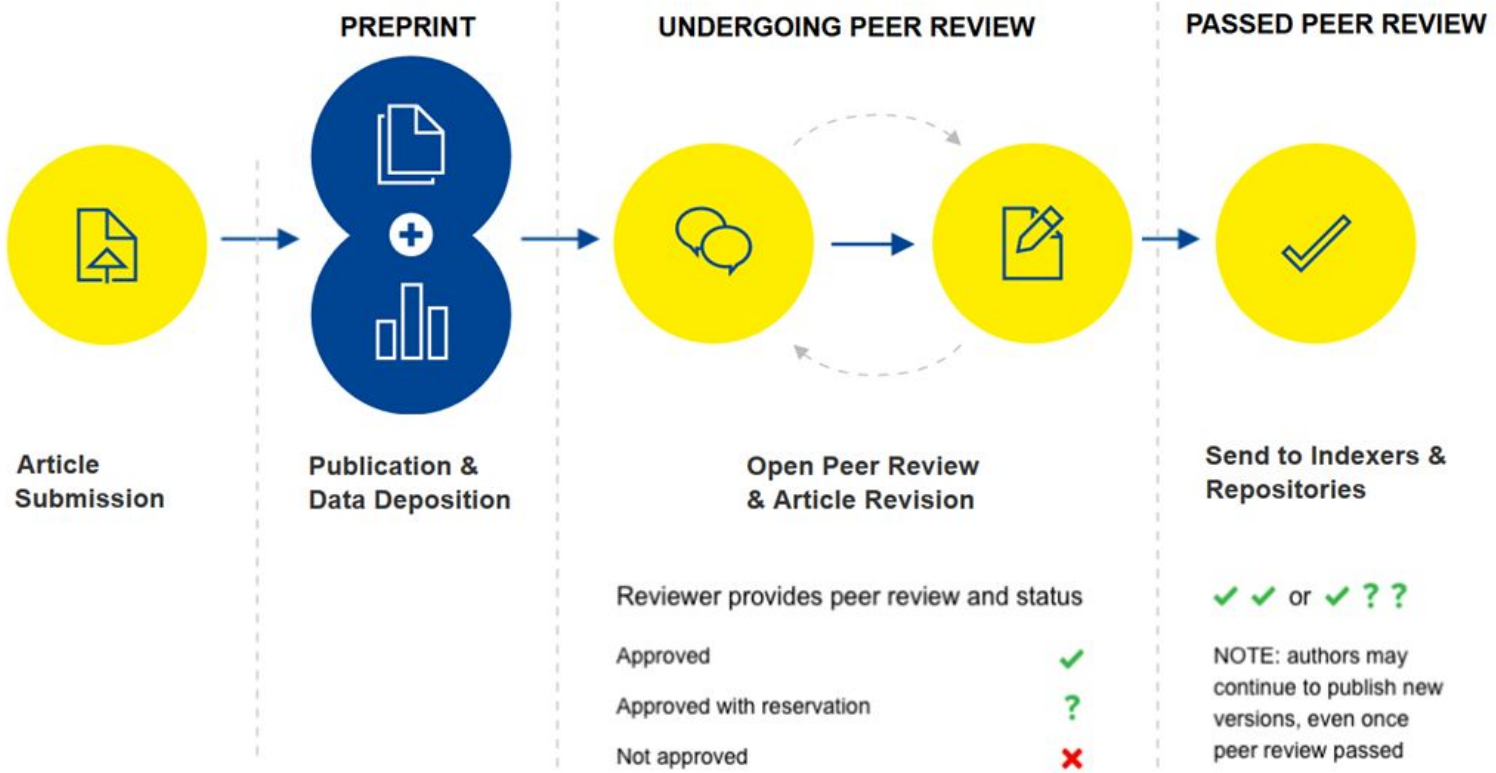
REVISED **Amendments from Version 1**

The manuscript has been updated in response to the reviewer's helpful and insightful comments. The most important changes are that the figures have been redesigned and the emphasis on the head-orientation study reduced. The MR images have been updated to use a consistent set of slices, Figures 3 & 4 have been merged into a single figure, and the average within-subject CoV has been added. Figure 1 (the number of spokes) and Figure 6 (colour scheme) have been updated for clarity. We hope that these new figures are clearer and more intuitive than the previous figures. The language used to refer to the head orientation study has been clarified to refer to results as "highly statistically significant" rather than "strong". A reviewer provided a plausible explanation for the negative values of ihMTR in CSF, namely the use of Fermi pulses in the preparation module, and this limitation has been discussed. A table with the mean ihMTR and inverse ihMTR values has been added. The discussion has been expanded to better set the context of the paper within existing literature, with better comparisons between our results and previous papers. We think the resulting paper is much improved and thank the reviewers again for their valued input.

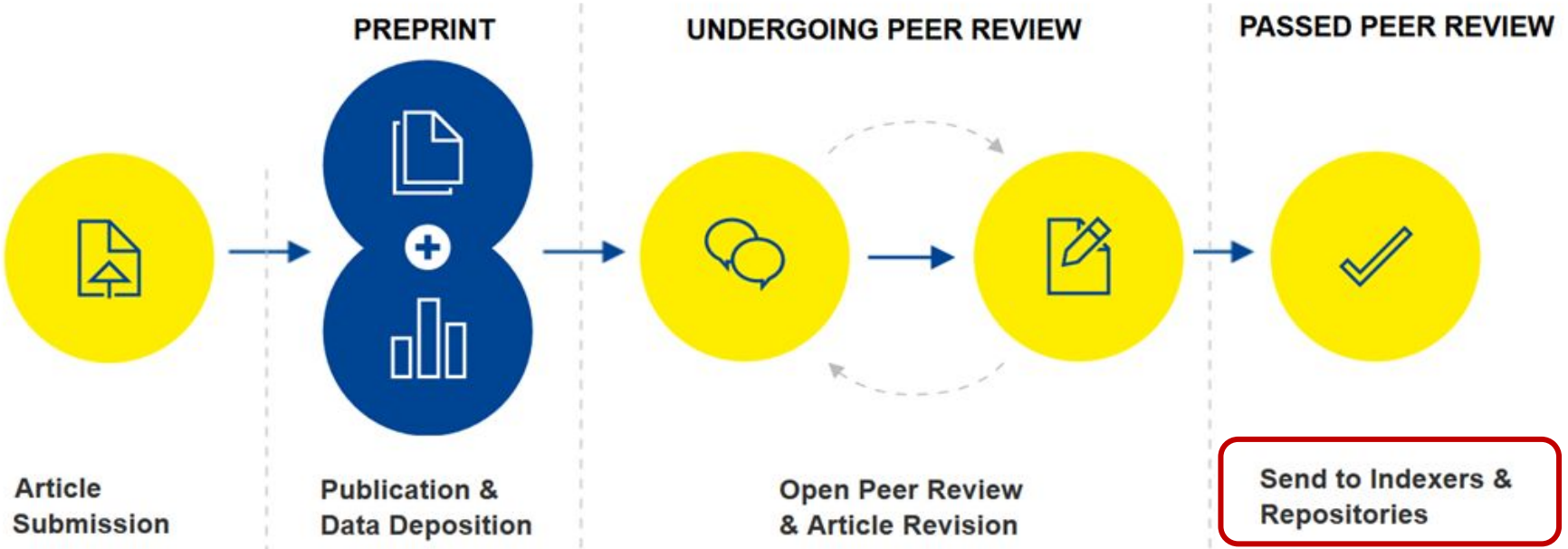
See the authors' detailed response to the review by Douglas Dean
See the authors' detailed response to the review by Gunther Helms
See the authors' detailed response to the review by Richard Dortch
See the authors' detailed response to the review by Olivier Girard and Lucas Soustelle

https://wellcomeopenresearch.org/articles/5-74

Publishing model

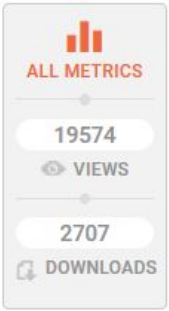


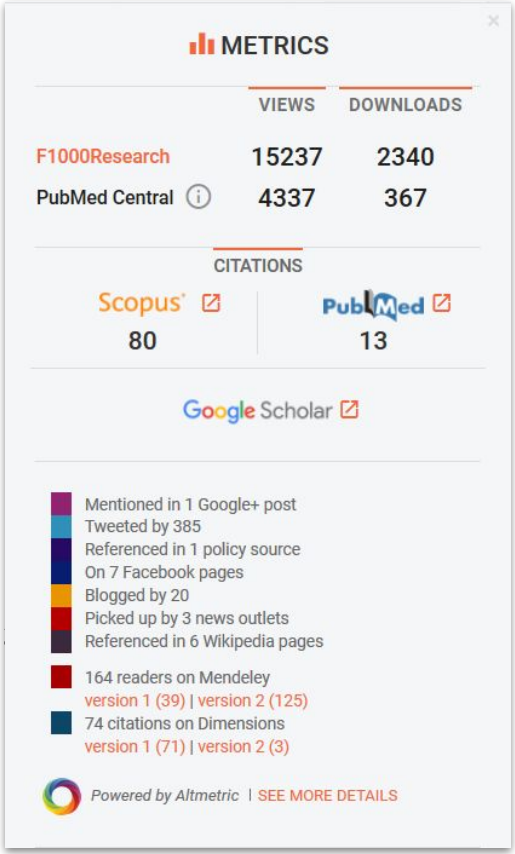
Publishing model: if passed peer-review



New generation metrics

Each article have a dedicated metrics page





Various types of articles

- Research Articles
- Brief Reports
- Data Notes
- Method Articles
- Software Tool Articles
- Study Protocols
- Clinical Practice Articles
- Case Studies & Reports
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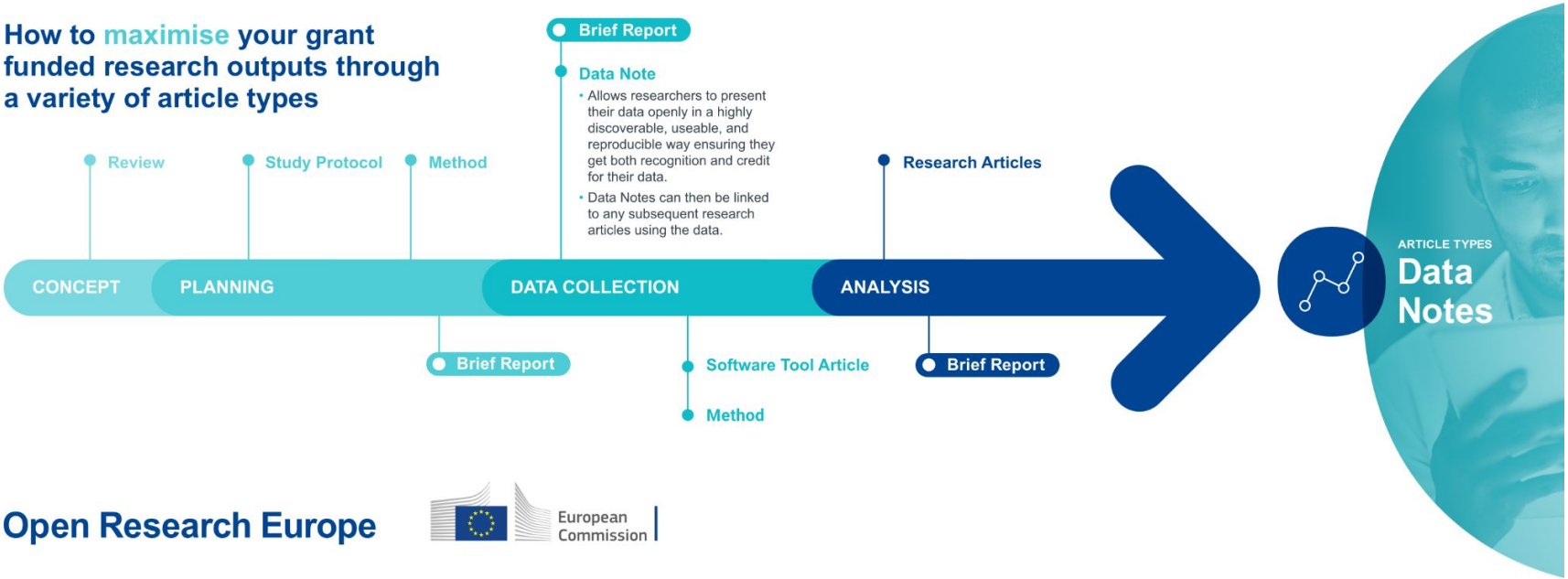
See full list for your subject area: Article Guidelines

Data Note

Dataset discoverable, shareable, and usable by publishing a Data Note



https://think.f1000research.com/open-research-europe-submission/data-notes/

Software Tool articles

Allow researchers & engineers to expand the reach of their work.

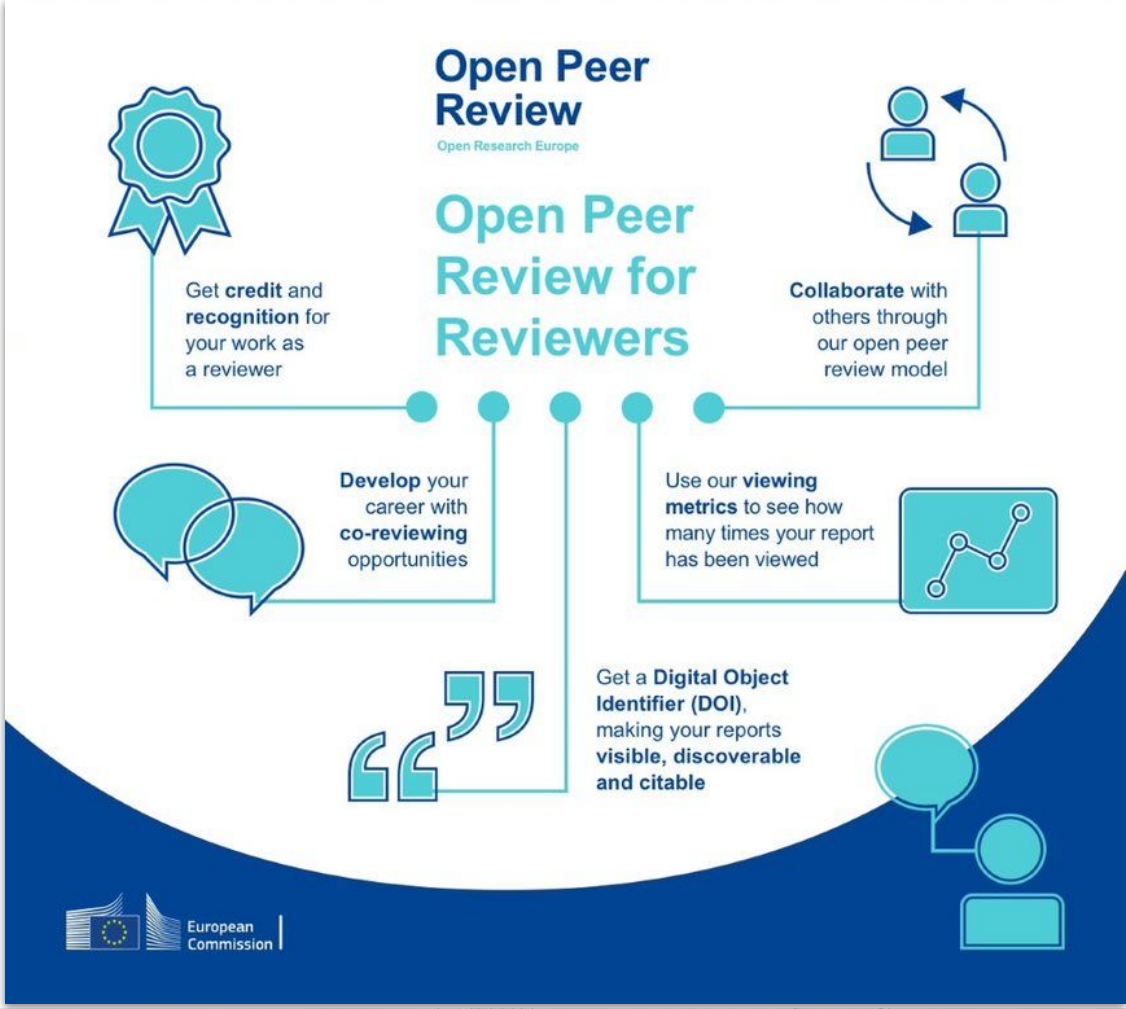
https://think.f1000research.com/open-research-europe-submission/software-tools

Find out how to become a reviewer

https://open-research-europe.ec.europa.eu/for-referees/guidelines

Open Peer Review

- Co-review with your peers
- Receive credit for your work
- Gain views and citations



European Open Science Cloud (EOSC)

EOSC - a virtual research environment for all researchers

https://eosc-portal.eu/

- Researchers at the core
- Store/share own data
- Find/re-use other data
- Combine different data
- Deploy AI tools on data
- Go beyond current science
- Engage in developing EOSC

European Open Science Cloud (EOSC)

- **EC initiative** aiming at developing an infrastructure providing its users with services promoting Open Science practices
- Part of the "**European Cloud Initiative - Building a competitive data and knowledge economy in Europe**", launched in 2016
- **Infrastructure is built by aggregating services** from several providers

Web of FAIR Data

for research, innovation and educational purposes

EUROPEAN OPEN SCIENCE CLOUD

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EOSC Portal - A gateway to information and resources in EOSC

The European Open Science Cloud (EOSC)

Offers 1.7 million European researchers and 70 million professionals in science and technology a virtual environment with open and seamless services for storage, management, analysis and re-use of research data, across borders and scientific disciplines.

More about EOSC

EUROPEAN OPEN SCIENCE CLOUD

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COMPUTE

STORAGE

SHARING & DISCOVERY

DATA MANAGEMENT

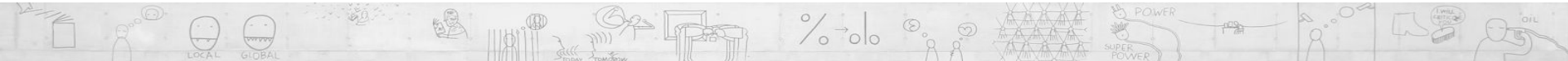
PROCESSING & ANALYSIS

SECURITY & OPERATIONS

TRAINING & SUPPORT

EOSC in progress

- The building blocks for an Open Science Commons serving all European researchers are in place. More to be done, including a clear model for **federating and on-boarding thematic communities into EOSC**
- To ensure the development beyond 2020, the current EOSC Governance has been working to establish a **European Partnership under Horizon Europe**
- The **EOSC Association**, the leading entity of the Partnership, was established in July 2020. Work progressing on the on-boarding process of new members.
- A **Strategic Research and Innovation Agenda** (SRIA) is under development, following an open consultation on its content



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Národní technická knihovna
National Library of Technology

Thank you for your attention

Questions?

eva.hnatkova@techlib.cz