

Global Data Accessibility: Limits of Openness?

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Open Science

“Open Science encompasses a collection of activities, principles and tools oriented at making scientific research accessible to all levels of society proposed to increase transparency and efficiency in research workflows and scholarly publishing.”

[Rahal and Havemann, 2019](#)

Open Access

Open Data

Free and Open Source Software

Open Educational Resources

Open Peer Review

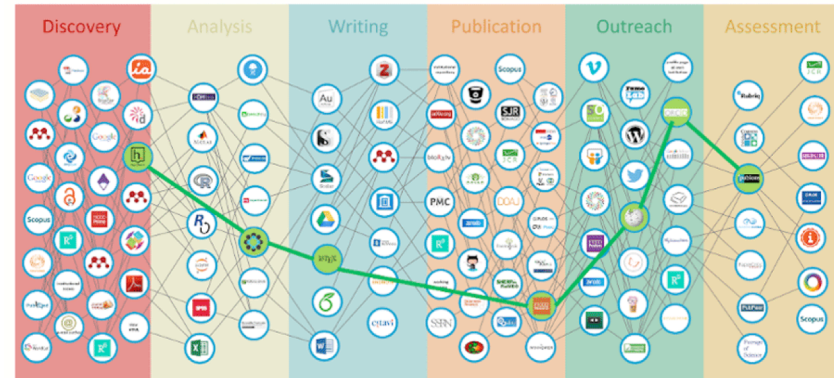
Open Methodologies

Open Hardware

Citizen Science

Open Science Ecosystem

- **Evolution of the digital infrastructures**, tools and online working practices that underpin open research activities
- **Digital tools are a ubiquitous** part of Open Science and facilitate access to open resources and collaborative working environments
- Many tools have **changed the way that research is done** and how research resources – including datasets, publications, educational resources and software – are **circulated globally**
- Support the creation of a **“digital commons”**



Access to a “Digital Commons”

- Much of the rhetoric around Open Science focuses on equitable access
- Open Science discussions have been spearheaded and largely driven by researchers in the Global North
 - Low/middle-income country (LMIC) researchers under-represented, meaning that their concerns and preferences are under-represented
 - Open Science tools/infrastructures often designed in and for the Global North and thus are premised on availability of external infrastructures
 - Funding for Open Science infrastructures reflects preferences and realities of research in the Global North

Key Questions to Ask About the OS Landscape

- Tools and underlying infrastructure are rapidly developing
 - Does the design and deployment of these tools adequately address the diverse user communities around the world?
 - If not, do they perpetuate specific visions of how research “should” be done?
 - Does this mean that membership to OS communities requires “fitting in” to specific ways of “doing”?
- Unpacking unconscious biases: two key observations:
 - Use of digital tools relies on physical, research and social infrastructures
 - Digital tools have geographic locations



Underlying Infrastructures



LMIC Research Infrastructures

- Conversations of research tend to assume high-income country (HIC) environments as “normal”
 - Unrepresentative benchmark
 - Introduces a “deficit model” for articulating contrasts
- Use of “binaries” when distinguishing LMIC research environments from high-income country labs (HICs): online/offline, visible/invisible, funded/unfunded
- Puts pressure on LMIC research environments to “catch up”
- Also flattens the range of support needed by LMIC researchers in order to be involved in OS activities

Infrastructures Affect Access and Participation

- Online/offline
 - Older software and hardware
 - Lower bandwidth
 - Cost of off-campus internet access
 - Sharing computers and ICTs

Infrastructures Affect Access and Participation

- Visible/invisible
 - Departmental websites but no personal ones
 - Subscription to professional networking sites but no updating of content
 - Use of commercial email addresses over university ones
 - Lack of policy to guide Open Science activities

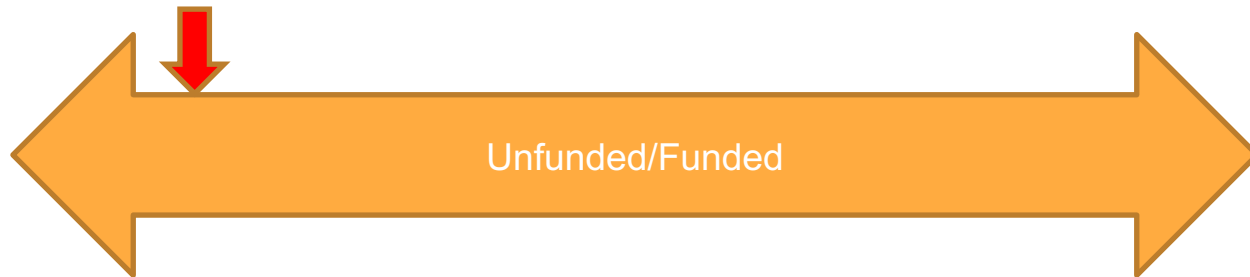
Infrastructures Affect Access and Participation

- Funded/unfunded
 - Small grants
 - High student numbers and rapid turnover
 - No "core" funding – including funding for technical support and library/curator services
 - Mix of personal investment and traditional grants

LMIC Research Infrastructures as a Continuum



Complicated set of challenges that reflect individual research environments



Avoiding Binary Assumptions

- Heterogeneous and complex research contexts impacts the *when*, *where* and *how* of Open Science activities
- Need a variety of solutions that address context-specific concerns
- Funding models and Open Science strategies often overlook nuances and key areas for future action
- Binaries also shape assumptions about *motivations and concerns* of scientists for engaging in OD practices – need dialogue

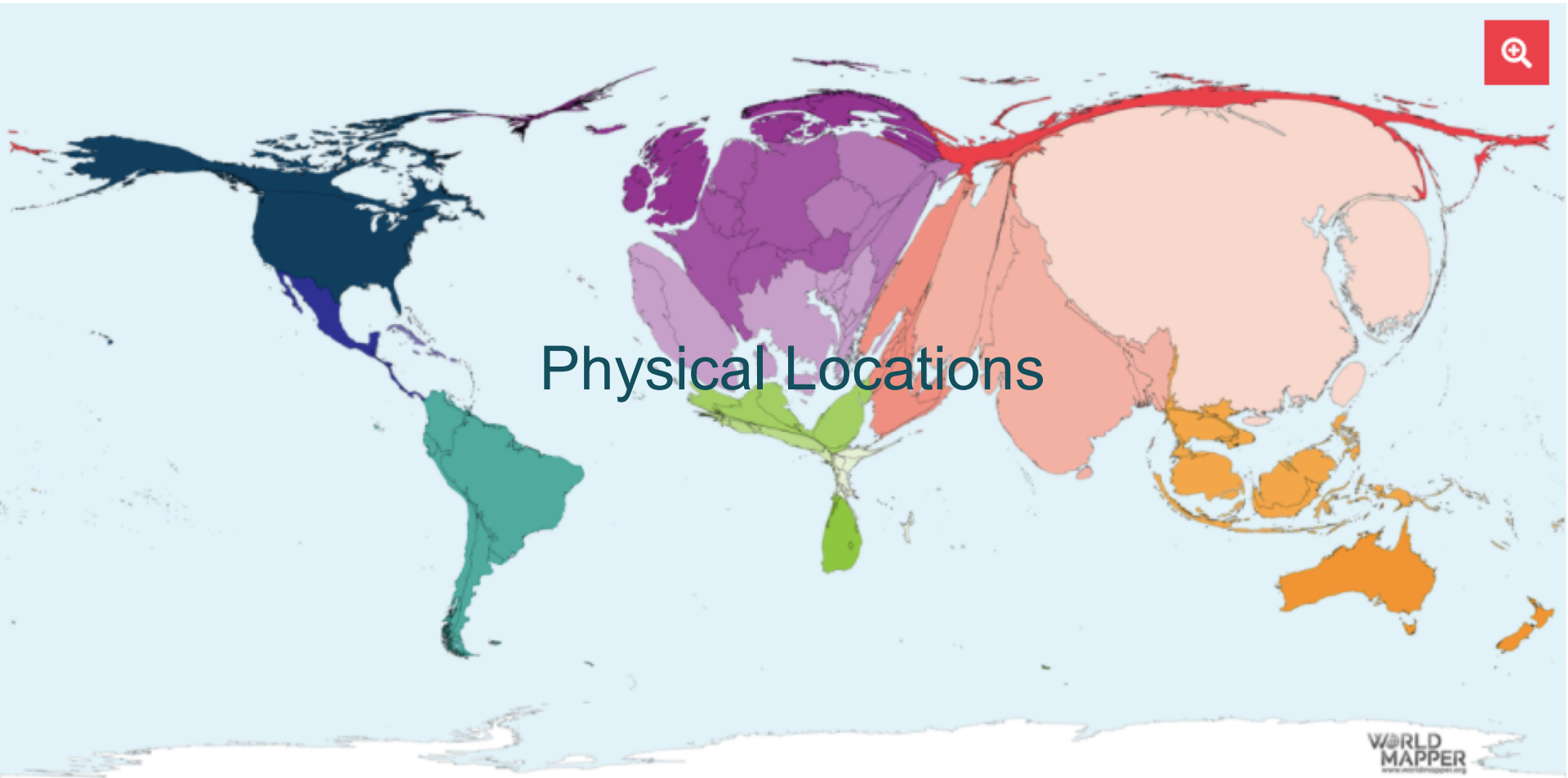
Sharing With Care

- Providing access doesn't guarantee accessibility
 - Need to critically think about what tools are used
 - "Low" vs "High" tech options
- Dialogue is key
 - LMIC researchers are often hesitant to raise issues
 - Without knowing what the problems are we can continue to perpetuate marginalization

Avoiding the Deficit Model

We should not build a digital commons that simply expects LMIC researchers to “catch up”





Physical Locations

Highly Variable Open Science Tools

- **Structure** of organization managing development and roll-out
- **Funding** for activities
- **Geographic location** of Open Science tool registration and of funding organizations
- **Language** of activity and the interface
- **Recruitment strategies** to build user communities
- **Scope/ Purpose**
- **Power dynamics**



- underlying values
- financial models
- language choices
- geographical location
- user communities



Host Locations

Number of
tools per

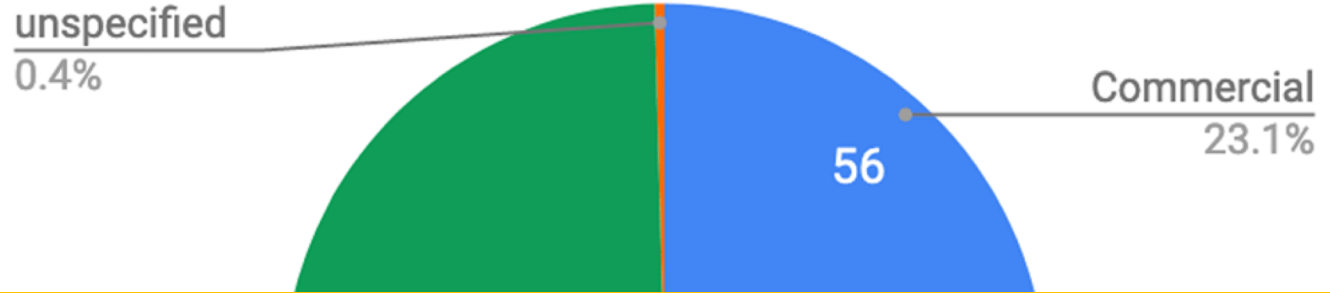


Location of Open Science tools can mean that they are subject to national legislation

Regions displayed are the United States of America (US), the European Union (EU), the United Kingdom (UK) and other parts of the world with concentration on US territory. 'Other' includes Argentina (n=1), Australia (n=2), Brazil (n=1), Canada (n=7), Colombia (n=1), Mexico (n=1), South Africa (n=1), Switzerland (n=5), with a total of n=242.

doi.org/10.12688/f1000research.26615.1

Funding



Illustration

Commercial funding and NPO status can mean that Open Science tools are subject to national financial legislation

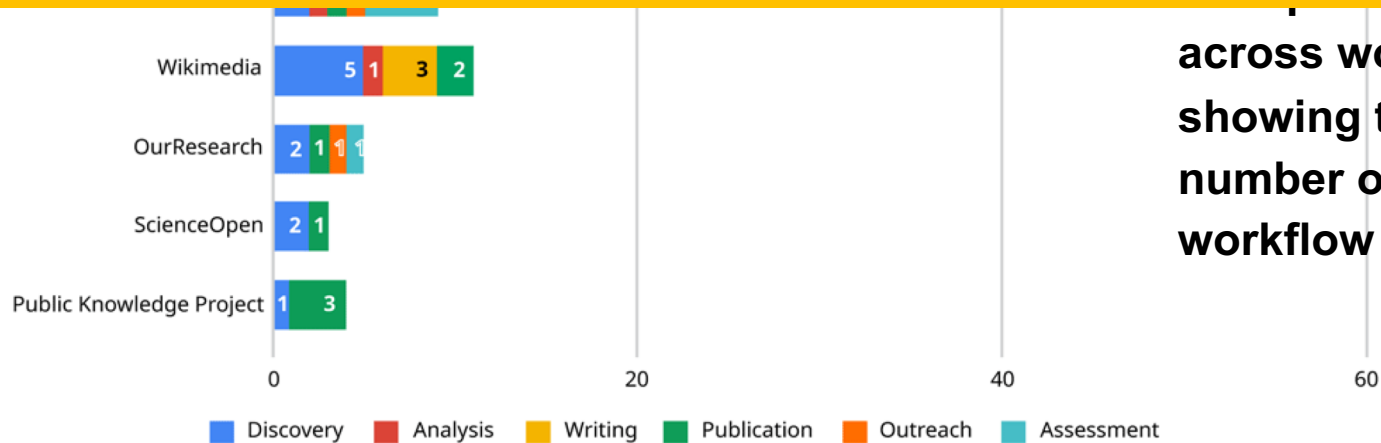
DOSTs.

The funding sources for the respective tools were classified as a) Commercial (n=56, 23.1%); b) Grant (n=19, 7.9%); c) mixed (commercial and grant, n=122, 50.4%), and d) Institutional (n=44, 18.2%). 0.4% of the tools (n=1) had no funding source specified. n=242.

Integration of Key Tools in Open Science Landscape



The availability of key Open Science tools influences entire pathways of use

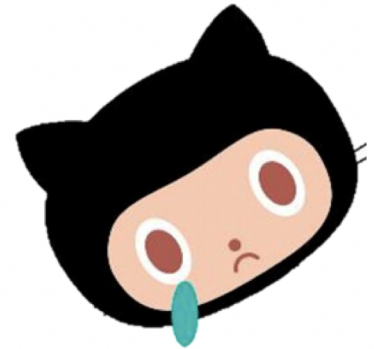


across workflow showing the number of tools per workflow step.

So What Does This Mean for Open Science Tools?

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GithubUserContent Is Blocked In Iran!

Critically Unpacking the OS Landscape

- Governments and commercial companies have undue influence on the landscape due to their hosting, financing, and otherwise influential roles
- We cannot simply assume that the **resultant ecosystem will automatically reflect and perpetuate the core values** of Open Science
- A range of different **factors inherent within Open Science tool design** create a landscape that continues to perpetuate marginalization and exclusion
- Undermines **the ideal of a “digital commons”** that provides unlimited access to shared resources

Room for Change

- The Open Science landscape is evolving and malleable – huge opportunities to create structures that support just and equitable research futures
- Being aware of current inequalities in access are very important in shaping these futures
- Be critical about your own choices, and talk to others about their choices



Final Comments

- Openness is an ideal, a set of practices, but also a responsibility
- It is the responsibility of all researchers to critically interrogate the Open Science tools and infrastructures that are shaping modern research
- Being aware of the issues of equitable access are important for making informed decisions
- Asking the “difficult questions” about tool/infrastructure design, regulation and deployment will ensure that we shape a Open Science future that is inclusive and equitable

Thank You

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Access 2
Perspectives



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