

Addressing Inclusivity in Open Science

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There are many definitions of “open science”

Open science is
transparent and
accessible knowledge
that is shared and
developed through
collaborative networks.

*Diversity and inclusion as core
values of open science*
(Whitaker, 2019)
<https://doi.org/10.5281/zenodo.3243217>

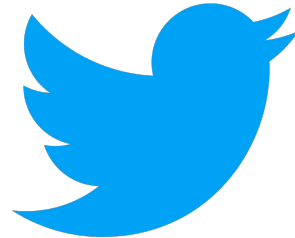


The umbrella of open scholarship

The goals of open science are, broadly, to democratize access and to promote good research practices.

Open science “spaces” can include...

- Open-source software projects
- Collaborative research projects
- Conferences
- Hackathons
- Informal discussions (i.e., on social media platforms)



The Plan

What we'll be talking about
today

- I. Inclusivity, accessibility, diversity, equity, and justice
- II. Broopen science & other social barriers
- III. Science vs. geography
- IV. Geopolitical threats to openness

Let's start with semantics...

Diversity refers to the presence of *variation in people, perspectives, etc.*, which often focuses on *increasing representation of underrepresented groups, ideas, etc.*

Diversity can be furthered by **inclusion**, which centers around *making people of different identities and backgrounds feel welcomed and valued* in a space.

Inclusivity depends heavily on **accessibility**, as it is hard to feel welcomed and valued when there are *barriers to you accessing spaces, ideas, technology, information, etc.*

Equity acknowledges that we don't all have the same *access to opportunities* and attempts to address this gap.

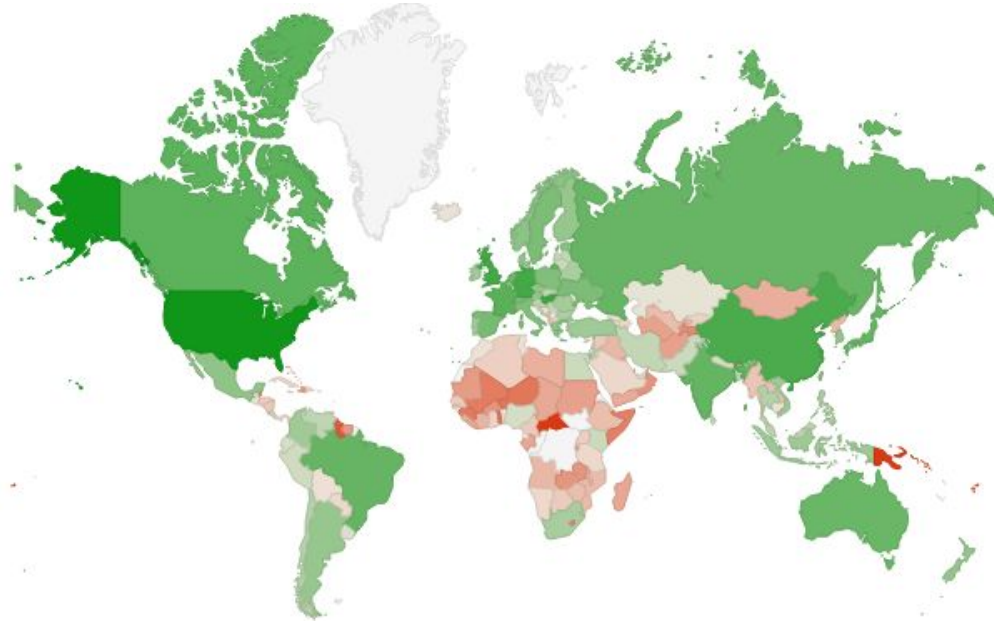
Justice seeks to further equity by *dismantling systemic disadvantages and barriers that prevent equal opportunity* for all people.



Inclusivity & accessibility go hand-in-hand

Open science spaces (initiatives, meetings, projects) are often inaccessible due to:

- Language
- Jargon
- Eligibility (e.g., formal institutional affiliation)
- Fees
- Hidden costs (e.g., technology, internet access, travel)
- Scheduling
- Cultural inaccessibility



Towards Global Inclusivity in Open Science (Gould van Praag et al., 2020)

<https://www.youtube.com/watch?v=RRwuOs0BA4I>

(Levitis, Gould van Praag, et al. 2021; Gau et al., 2021; medium.com/@hoffa/github-top-countries-201608-13f642493773)

Broken Science

How do you find your place in
academia/research ?

Asked to several under represented groups

"With most people I've found that no matter how much you pass, just mentioning that you're transgender, even if they're progressive they usually treat you different."

Anonymous

"Where do I start (referring to being underrepresented in academia)? Ever since undergrad I felt like an outsider, despite continuous effort to be part of the institutions. Problem was that bw needling grants & being the first to discover whatever, there were many mishaps, the higher ups starting an idea, and the rest repeating same"

Anonymous



*"It is hard to feel
connected when there
is no people like you
in the room."*

Anonymous shared
opinion

Open, Safe & Brave Spaces

Open, Safe & Brave Spaces

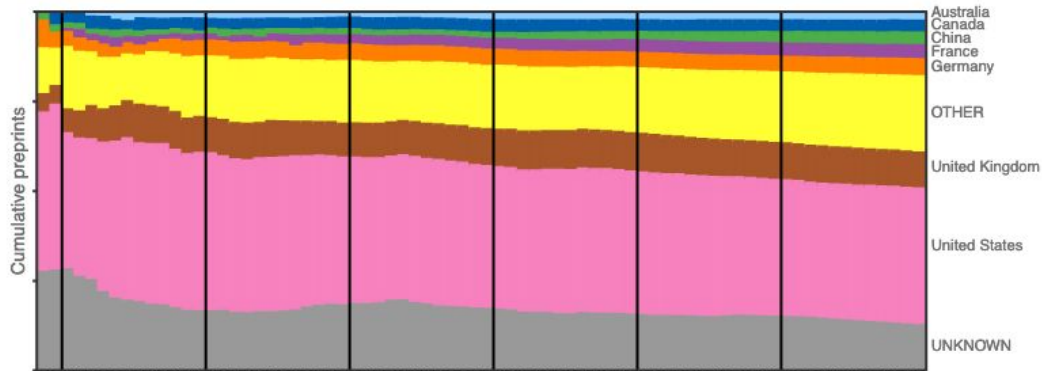
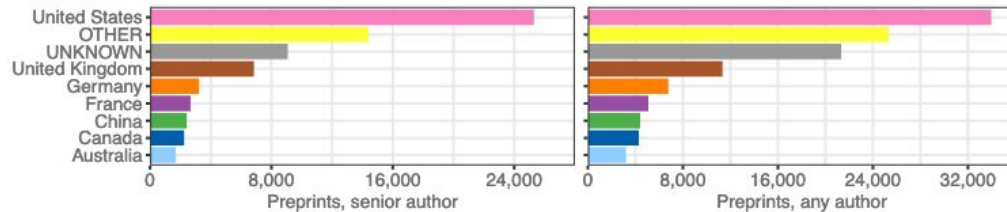
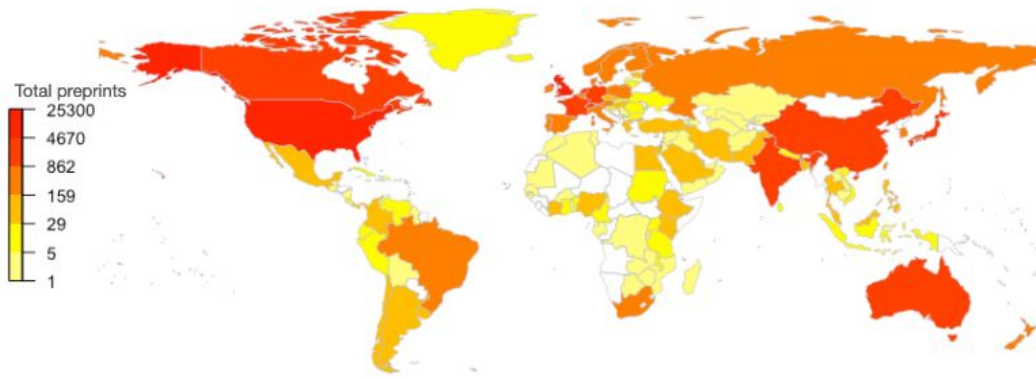
Safe spaces allow marginalized groups to discuss their experiences openly without being targeted.

Brave spaces are facilitating discussion

In Virtual Settings

- Accessible, welcoming to newcomers,
-

Science vs. Geography



“Within the four top medical journals, studies from different areas of the world are not equally cited. This may indicate that studies from some countries face greater difficulties in being published. Therefore, papers from these countries must be of higher quality to be published.”

Conclusion of

<https://jech.bmj.com/content/65/2/119>

Figure taken from: <https://elifesciences.org/articles/58496>

20 years of African Neuroscience

[doi:https://doi.org/10.1101/2020.06.03.131391](https://doi.org/10.1101/2020.06.03.131391)

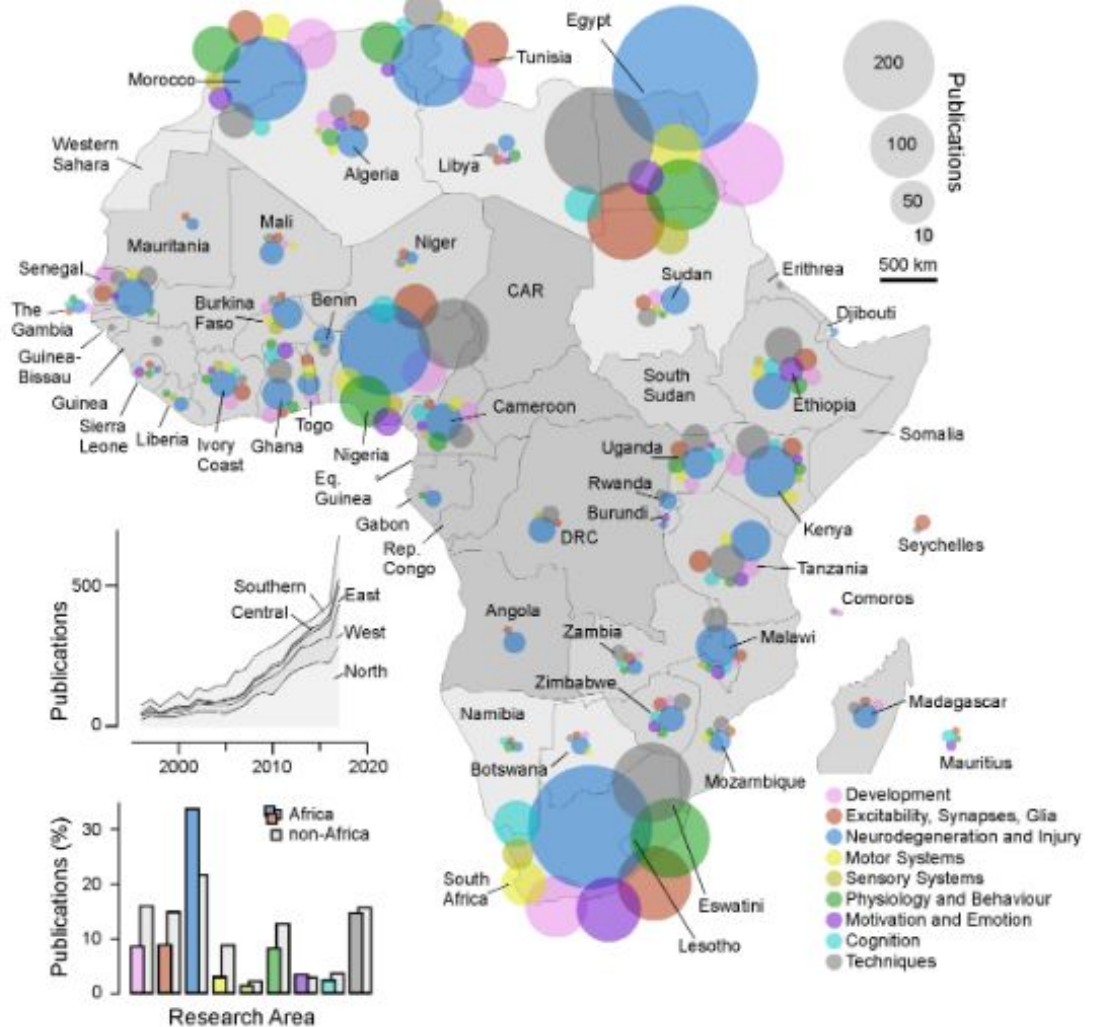
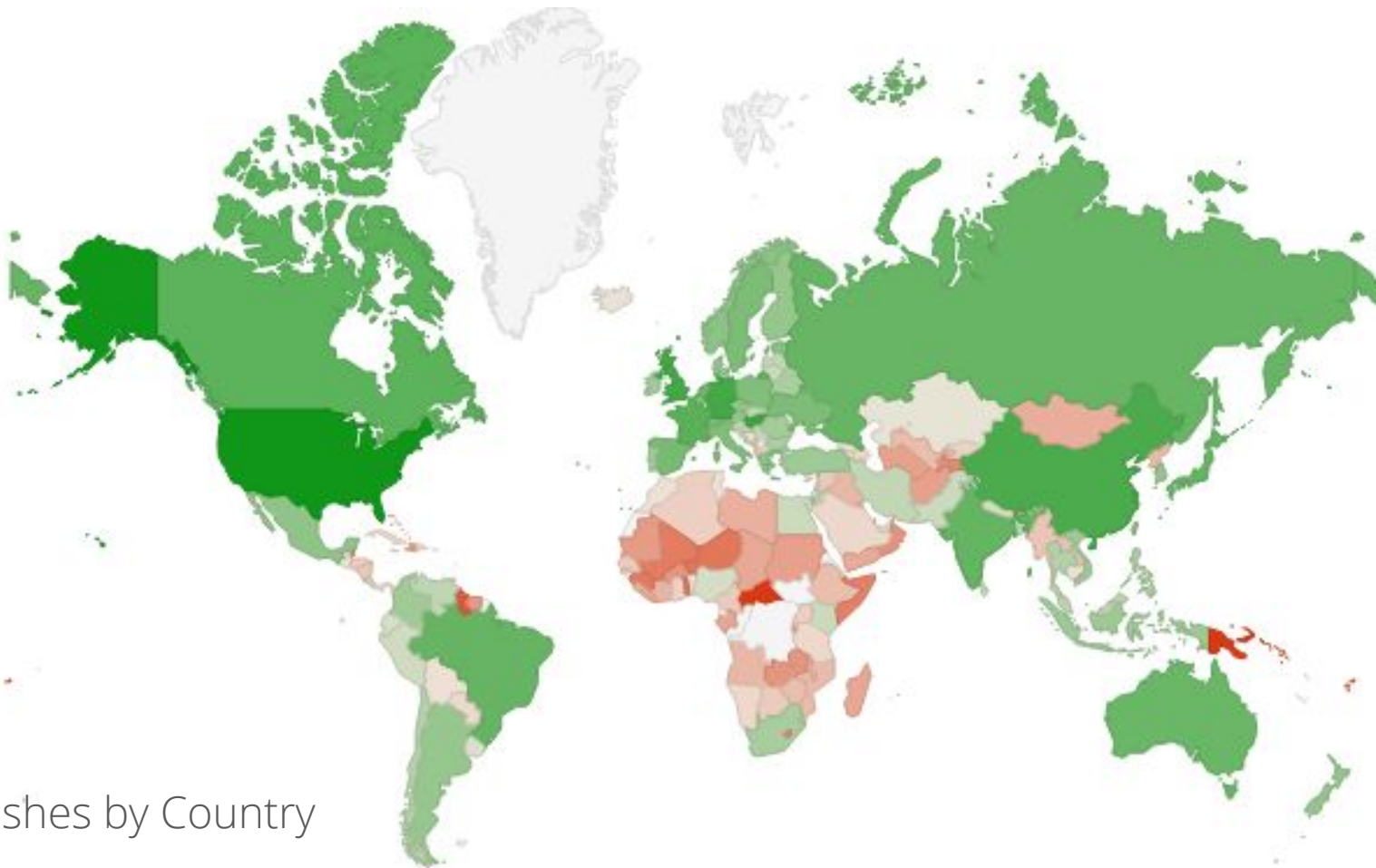


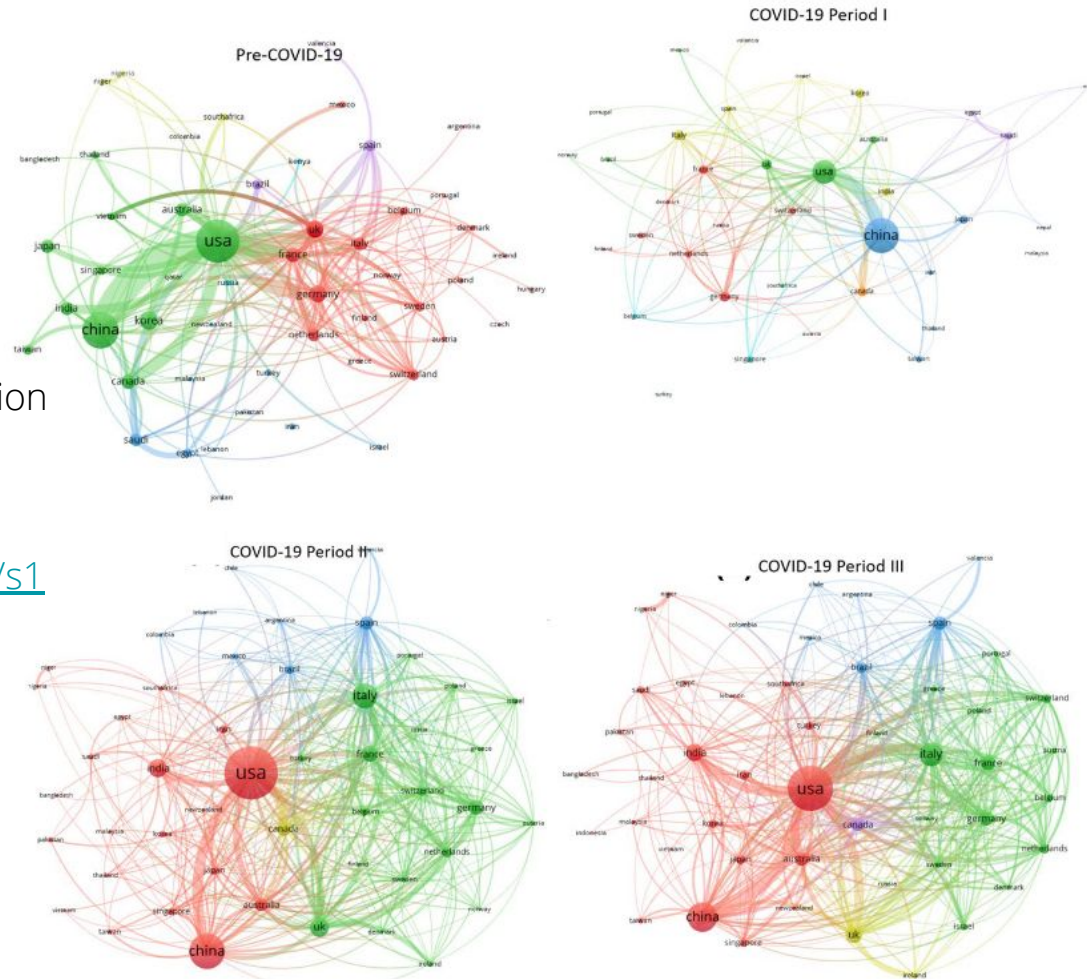
Image source: <https://www.biorxiv.org/content/10.1101/2020.06.03.131391v1>



GitHub Pushes by Country

International collaboration
during the COVID-19
crisis: autumn 2020
developments

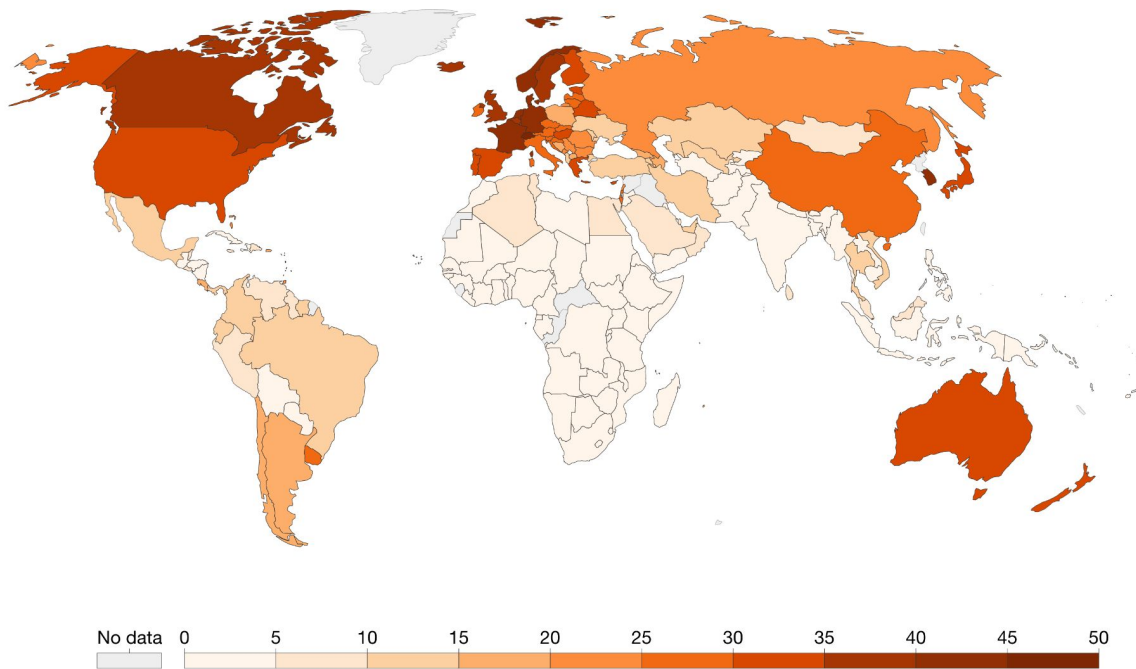
<https://doi.org/10.1007/s1192-021-03873-7>



Source: <https://doi.org/10.1007/s1192-021-03873-7>

Broadband subscriptions per 100 people, 2017

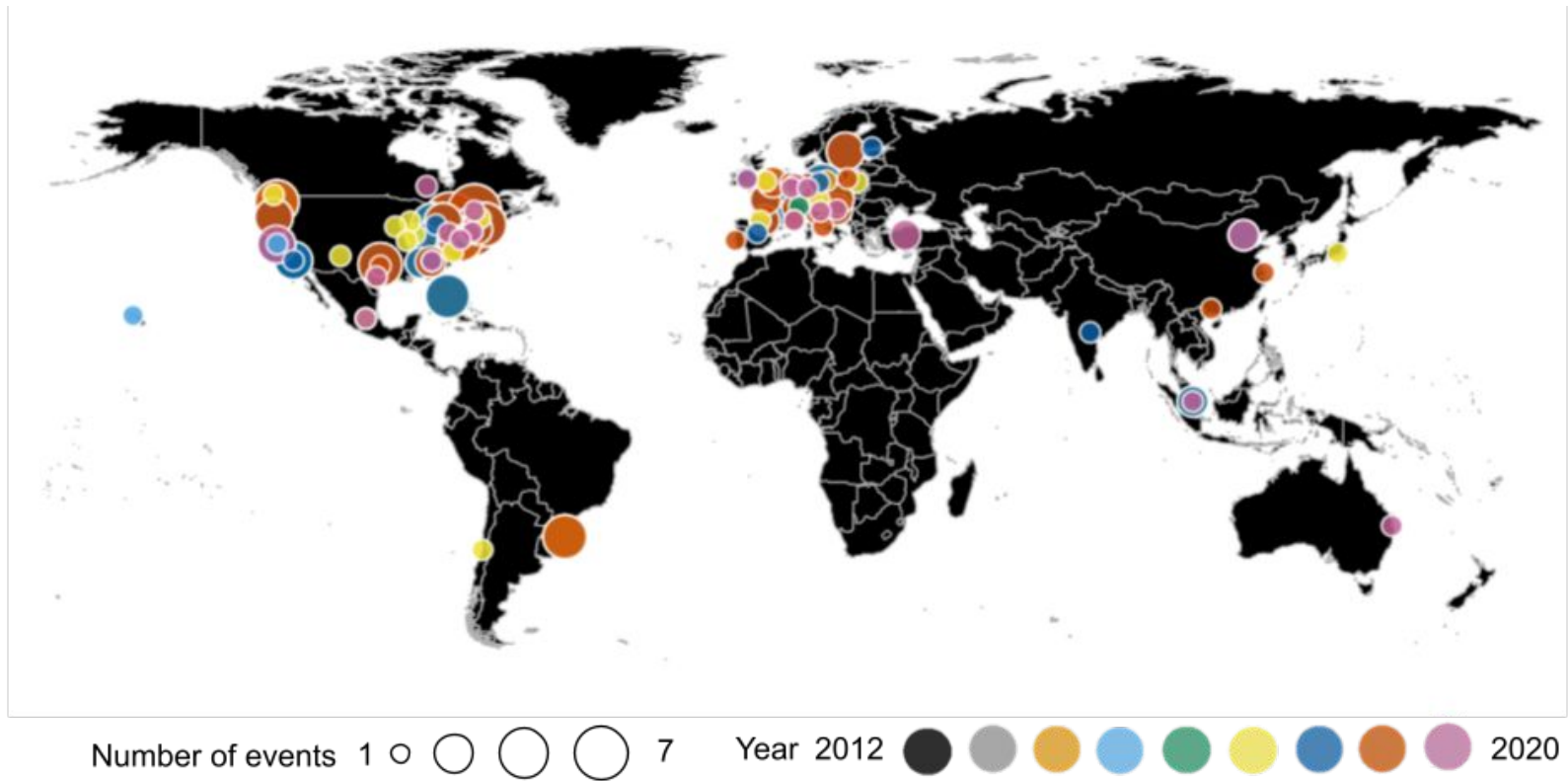
Broadband subscriptions refer to fixed subscriptions to high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s.



Source: World Bank

Note: For more details on the definition see the sources tab.

OurWorldInData.org/internet/ • CC BY



Geographic distribution of Brainhack events 2012 to today

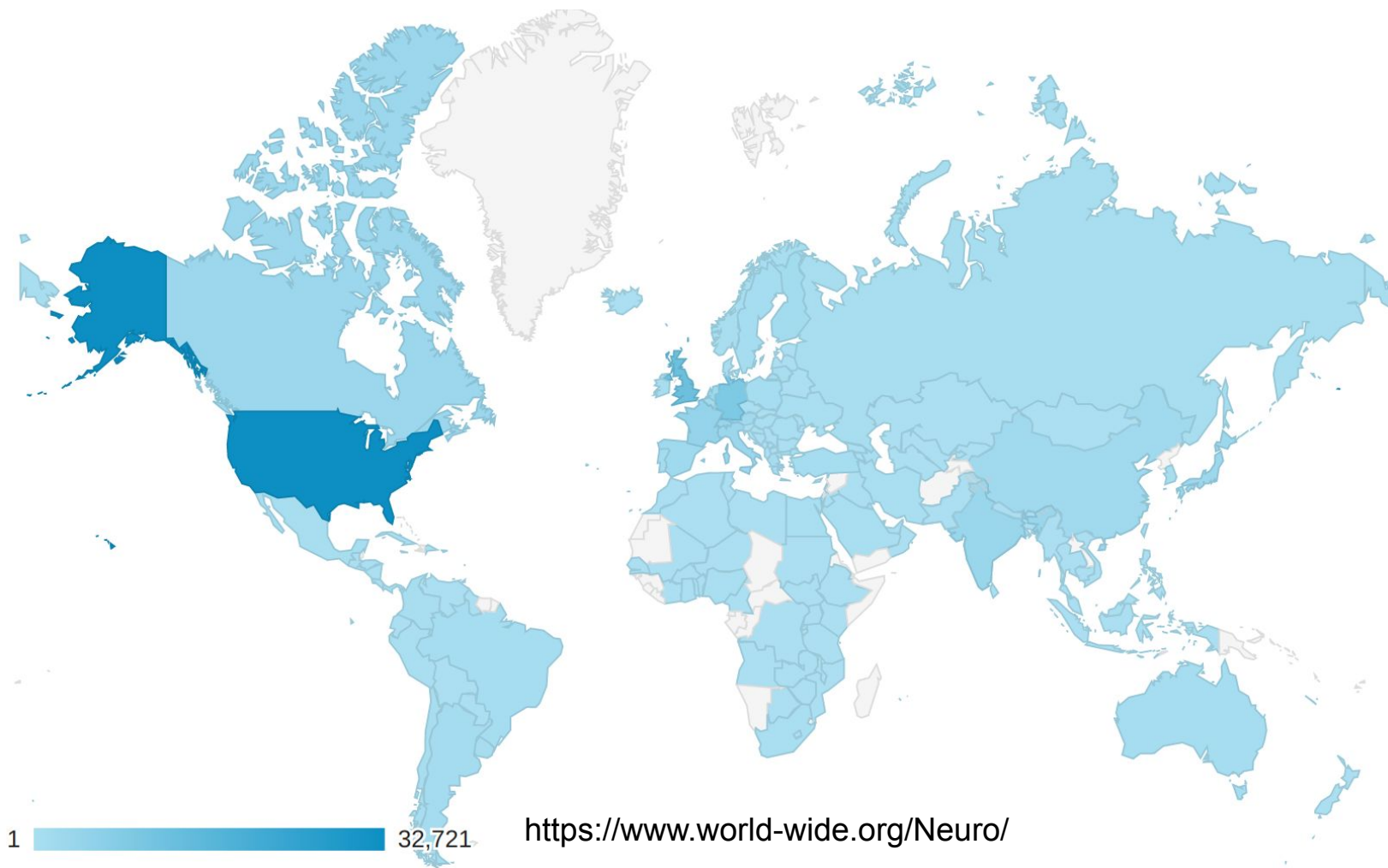




Image source:

<https://medium.com/@kording/how-to-run-big-neuro-science-conferences-online-neuromatch-io-49c694c7e65d>

Image source: <https://twitter.com/neuromatch/status/1390044856441925632/photo/1>

NMA 2020

 neuromatch
academy

191 TAs

IN 185 PODS



FROM 35 COUNTRIES

Science vs. Geography: Databases to Reach out Scholars

- [Black in Neuro](#) (#BlackInNeuro @BlackinNeuro on twitter)
- [The Spark Society's Database of Cognitive Scientists of Color](#) (Continually updated Google Doc)
- [Black Psychology and Neuroscience Pls](#) (Continually updated Google Doc)
- [SACNAS Biography Project](#) (Collection of first-person stories by and about Chicano/Hispanic and Native American scientists)
- [National Hispanic Science Network](#) (Member directory)
- [Diversity STEM Conferences Speakers List](#) (neuroscience keyword search)
- [Ciencia Puerto Rico](#) (Member directory, advanced search for neuroscience faculty)
- [Society for Black Brain and Behavioral Scientists](#) (Membership required to view directory)
- [I Am a Scientist](#) (Collection of researcher profiles, not specific to neuroscience. Downloadable classroom materials.)
- [Scientist Spotlights Initiative](#) ("Integrating themes of diversity and inclusion while teaching course content")
- [Alba Network](#) (Neuroscience researchers network)
- [Women in Neuroscience Repo](#) (Repo of Women in Neuroscience)



Geopolitical Barriers to “Open” Science

Geopolitical barriers to openness

Government censorship and copyright laws restrict access to online resources

- Great Firewall of China blocks
 - YouTube
 - Vimeo
 - Google products
 - Twitter
 - & more
- US embargoes on technology in Cuba, Iran, North Korea, Crimea, etc.
- Zoom is inaccessible in Cuba, Iran, Syria, Ukraine (Crimea), and North Korea
- Google blocks logins from Crimea, Cuba, Iran, Myanmar, North Korea, and Syria

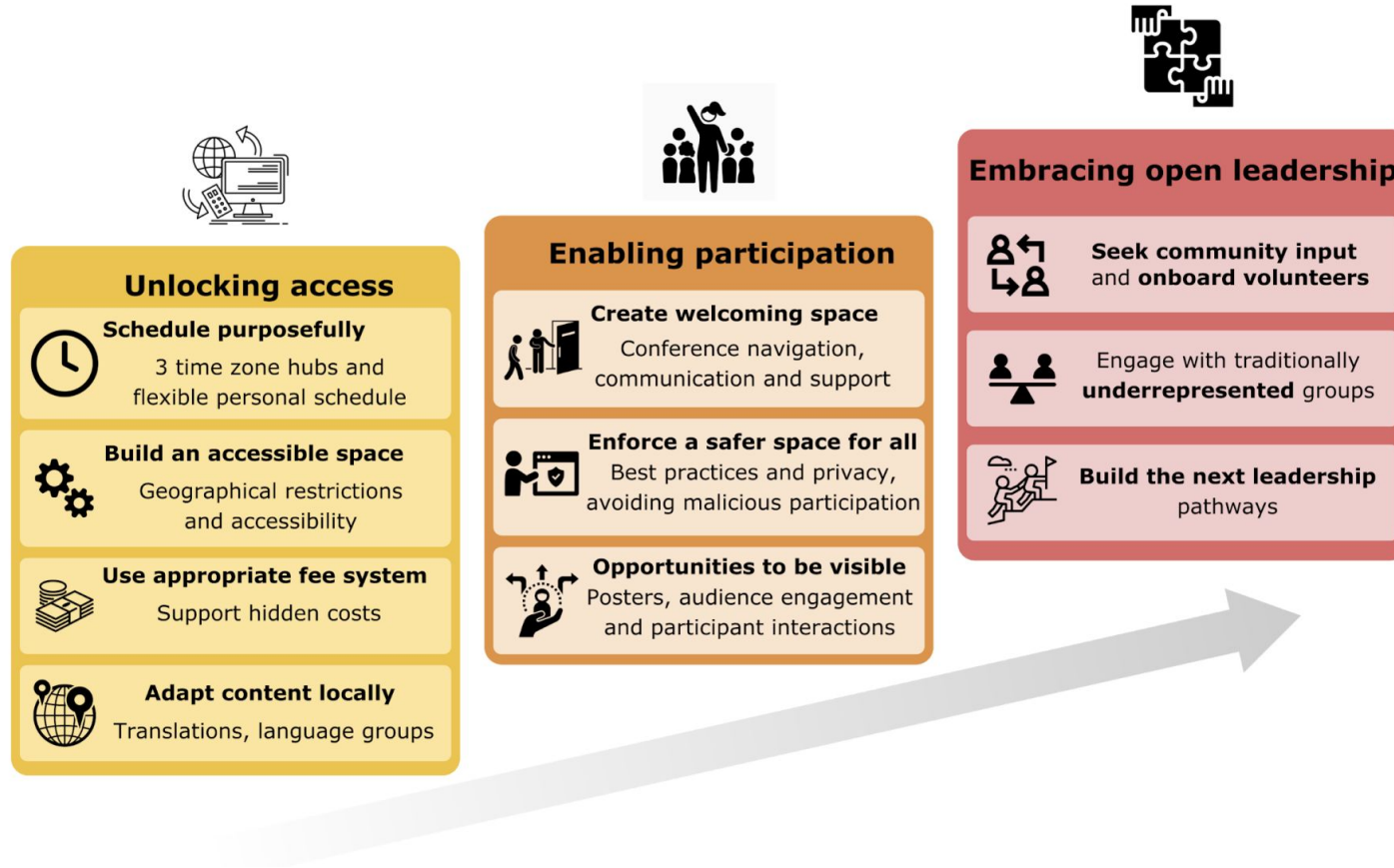
Where do we go from here?

Practical suggestions

For further reading, check out this guide from Queer in AI:

<https://sites.google.com/view/queer-in-ai/diversity-guide?authuser=0>

- Use inclusive language.
- Basic steps of accessibility starts with a friendly website, flyers or relevant online materials.
- Enforce using closed captioning for video calls and video materials.
- Promote & normalize asking pronouns. Provide spaces for (neo)pronoun usage.
- In online spaces, to ensure safety; having a clear code of conduct and working reporting mechanisms is necessary.
- Select online platforms according to the service providers per country/region.



Inclusivity is key

(Levitis, Gould van Praag, et al. 2021)

Resources

Towards Global Inclusivity in Open Science:

<https://www.youtube.com/watch?v=RRwuOs0BA4I>

Levitis, E., Gould van Praag, C. D., Gau, R., Heunis, S., DuPre, E., Kiar, G., ... Maumet, C. (2021, March 23). Centering inclusivity in the design of online conferences. <https://doi.org/10.31234/osf.io/vj5tu>

Masuzzo P, Martens L. 2017. Do you speak open science? Resources and tips to learn the language. PeerJ Preprints 5:e2689v1 <https://doi.org/10.7287/peerj.preprints.2689v1>

Abdill, R. J., Adamowicz, E. M., & Blekhman, R. (2020). Meta-Research: International authorship and collaboration across bioRxiv preprints. Elife, 9, e58496. <https://doi.org/10.7554/eLife.58496>

Akre, O., Barone-Adesi, F., Pettersson, A., Pearce, N., Merletti, F., & Richiardi, L. (2011). Differences in citation rates by country of origin for papers published in top-ranked medical journals: do they reflect inequalities in access to publication?. Journal of Epidemiology & Community Health, 65(2), 119-123. <http://dx.doi.org/10.1136/jech.2009.088690>

Cai, X., Fry, C. V., & Wagner, C. S. (2021). International collaboration during the COVID-19 crisis: autumn 2020 developments. Scientometrics, 126(4), 3683-3692. <https://doi.org/10.1007/s11192-021-03873-7>

Bezuidenhout, L. M., Leonelli, S., Kelly, A. H., & Rappert, B. (2017). Beyond the digital divide: Towards a situated approach to open data. Science and Public Policy, 44(4), 464–475. <https://doi.org/10.1093/scipol/scw036>

Whitaker, Kirstie. (2019, June). Diversity and inclusion as core values of open science. Zenodo. <http://doi.org/10.5281/zenodo.3243217>

Gould van Praag, Cassandra. (2020, June). Towards Global Inclusivity in Open Science <https://www.youtube.com/watch?v=RRwuOs0BA4I>

Guide for inclusive virtual conferences from Queer in AI: <https://sites.google.com/view/queer-in-ai/diversity-guide?authuser=0>

Maina, M. B., Ahmad, U., Harun, I. A., Kwairanga, H. S., Nasr, F. E., Salihu, A. T., ... & Baden, T. (2020). 20 years of African Neuroscience: Waking a sleeping giant. BioRxiv. <https://doi.org/10.1101/2020.06.03.131391>

Thanks!

Slides available online:

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