Inclusiveness in Open Science

OpenCon Switzerland, 21.09.2018, Bern

Malvika Sharan

Computational Biologist &
Community Outreach Coordinator

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About me

- Computational biologist in European Molecular Biology Laboratory (EMBL)

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21. September 2018

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- PhD in bioinformatics (RNA and infection biology), Germany (2016)

- 9 years in bioinformatics field

- 4 years in computational teaching and outreach

- Currently working full time in community outreach and training

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The Global Scientific Community

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Lack of "global-ness"

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Lack of "global-ness" in scientific community

- Science and engineering are more relevant globally than ever
  - the research focus around the world is different.

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- Information-sharing technologies facilitate the cross border exchange
  - it is not accessible to those who lack resources.

https://globalscience.berkeley.edu/sites/default/files/global_engagement

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- Data production and accessibility have increased

  - skill transfer is important to maximize the benefit.

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- Data production and accessibility have increased

  - skill transfer is important to maximize the benefit.

- We want to be inclusive of the scientific talents from diverse backgrounds

  - we need to "consciously correct our unconscious bias".

https://globalscience.berkeley.edu/sites/default/files/global_engagement

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Lack of "global-ness" in scientific community

1. Research focus (e.g. policy)

- the research focus around the world is different.

2. Information sharing (e.g. scholarly communication)

- it is not accessible for those who lack resources.

3. Training

- skill transfer is important to maximize the benefit.

4. Diversity

- we need to "consciously correct our unconscious bias".

https://globalscience.berkeley.edu/sites/default/files/global_engagement

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Found a compromise in Open Science

"Make research resources available online without price barriers and without most permission barriers." – Suber et. al., 2012

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'Open Science is an umbrella term that involves various movements to remove barriers from sharing scientific resources at all stages of research'

(FOSTER Project, European Union)

https://unsplash.com/photos/e8e4YY65sOk

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'Open Science is an umbrella term that involves various movements to remove barriers from sharing scientific resources at all stages of research'

(FOSTER Project, European Union)

Open Access

Open Data

Open Source

Citizen Science

Education resources

Scientific Networks

Peer Review

Notebooks

...

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What is inclusiveness?

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https://www.freepik.com/free-photos-vectors/joining-hands

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Inclusiveness is..

"…inclusion of individuals or groups who were previously excluded"

Ref: C. Talmage and R. C. Knopf, Springer International Publishing AG 2017, New Dimensions in Community Well-Being

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https://www.freepik.com/free-photos-vectors/joining-hands

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Inclusiveness is..

"…inclusion of individuals or groups who were previously excluded"

"...measured in terms of eligibility, opportunities, and involvement in decision-making and leadership"

Ref: C. Talmage and R. C. Knopf, Springer International Publishing AG 2017, New Dimensions in Community Well-Being

20. September 2018

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EMBL

Inclusiveness is..

"…inclusion of individuals or groups who were previously excluded"

"...measured in terms of eligibility, opportunities, and involvement in decision-making and leadership"

"...achieved when members share and not compete for resources or power"

Ref: C. Talmage and R. C. Knopf, Springer International Publishing AG 2017, New Dimensions in Community Well-Being

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https://www.freepik.com/free-photos-vectors/joining-hands

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Inclusion vs Inclusiveness

20. September 2018

https://unsplash.com/photos/AXqMy8MSSdk

Inclusion vs Inclusiveness

Inclusion

- Process by which a community values, includes and involves diversity to improve its well-being

Ref: C. Talmage and R. C. Knopf, Springer International Publishing AG 2017, New Dimensions in Community Well-Being

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https://unsplash.com/photos/AXqMy8MSSdk

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Inclusion vs Inclusiveness

Inclusion

- Process by which a community values, includes and involves diversity to improve its well-being

Inclusiveness

- Outcomes of inclusive policies and actions undertaken in a community to improve its well-being

Ref: C. Talmage and R. C. Knopf, Springer International Publishing AG 2017, New Dimensions in Community Well-Being

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- Process by which a community values, includes and involves diversity to improve its well-being

- Aims towards providing access to community resources to achieve social equality

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Inclusion

- Process by which a community values, includes and involves diversity to improve its well-being

- Aims towards providing access to community resources to achieve social equality

Inclusiveness

- Outcomes of inclusive policies and actions undertaken in a community to improve its well-being

- Aims towards achieving heterogeneity in community leadership and decision makers

Ref: C. Talmage and R. C. Knopf, Springer International Publishing AG 2017, New Dimensions in Community Well-Being

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How are inclusiveness and Open Science connected?

https://unsplash.com/photos/IM0GHpsjJic

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@*CameronNeylon* (http://cameronneylon.net) and http://www.openaccessweek.org

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C@meronNeylon
@CameronNeylon

Following

The *only* thing that links all varying strands of #openscience (and #openresearch generally) is inclusion & diversity as 1st principle 2/n

12:24 AM - 10 Aug 2017

Open Access Week 2018

Designing Equitable Foundations for Open Knowledge

October 22 - 28

इंटरनेशनल ओपन एक्सेस वीक 2018 "ओपन नॉलेज के ललए न्यायसंगत नींव लिजाइन करना"

Posted by Nick Shockey on May 24, 2018 at 12:55pm   View Blog

ओपन एक्सेस वीक एिवाइजरी कमेटी को यह घोषणा करतेहुए प्रसन्न हैलक, 22-२८ अक्टू बर २०१८ को होनेवाले2018 इंटरनेशनल ओपन एक्सेस वीक के ललए थीम "खुलेज्ञान के ललए न्यायसंगत नींव लिजाइलनंग" होगी।

इस साल की थीम संक्रमण मेंएक लवद्वान प्रणाली को दशााती है। जबलक सरकारें, लनलि, लवश्वलवद्यालय, प्रकाशक, और लवद्वान ओपन एक्सेस को और प्रथाओंको तेजी सेअपनानेलगेहैं। इस साल का थीम लसस्टमोंको लिजाइन करनेकेबारेमें समावेशी, न्यायसंगत और वास्तव मेंएक लवलि वैलश्वक समुदाय की आवश्यकताओंको पूरा करनेके ललए उद्युक्त करता है। इस साल केओपन एक्सेस वीक ने सभी महत्वपूूणालहतिारकोंको इस महत्वपूूणाकाम को आगेबढानेमेंभाग लेनेके ललए आमंलित लकया है।

- Great job!

*@CameronNeylon (*http://cameronneylon.net*) and *http://www.openaccessweek.org

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C@meronNeylon
@CameronNeylon

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- Great job!

- …wait, that's not Hindi.

@CameronNeylon (http://cameronneylon.net) and http://www.openaccessweek.org

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Open Science democratizes accessibility and engagement in research

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Open Science democratizes accessibility and engagement in research but it can't assure that it will happen.

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Open Science democratizes accessibility and engagement in research but it can't assure that it will happen. In fact it can be inaccessible and unwelcoming to many.

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Open Science democratizes accessibility and engagement in research but it can't assure that it will happen. In fact it can be inaccessible and unwelcoming to many.

Dr. Christie Bahlai
@cbahlai

Following

Replying to @cbahlai @o_guest and 6 others

It's not just about choosing right licences and putting code on github, it's about actually improving accessibility and bringing people in

10:19 AM - 4 Jun 2017

9 Retweets 32 Likes

Principle Investigator, Kent University (Source: Twitter @cbahlai)

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Open Science is not always open, accessible and inclusive.

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https://unsplash.com/photos/nUBb39hjAYg

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Example

Due to lack of funding in research, specially in the developing countries

Ezequiel Vera 🦖 @ezequielvera · 8h

Gold **open access** fee of some journals (e.g. C.3300 dollars in CretRes for say something) is more or less 4 to 5 times the month salary of a young investigator here at Argentina. Every year we have less number of grants (also decreasing in total money granted)

Jon Tennant ✔ @Protohedgehog

"I've realised that if I want my research to be widely read by my Latin American colleagues and have a true impact, and not just an impact factor, the only way to go is to publish it in an open-access journal."
theguardian.com/science/2018/s…

💬 2   🔁 5   ♡ 10   ✉

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How much does your country invest in R&D?
UNESCO Institute for Statistics
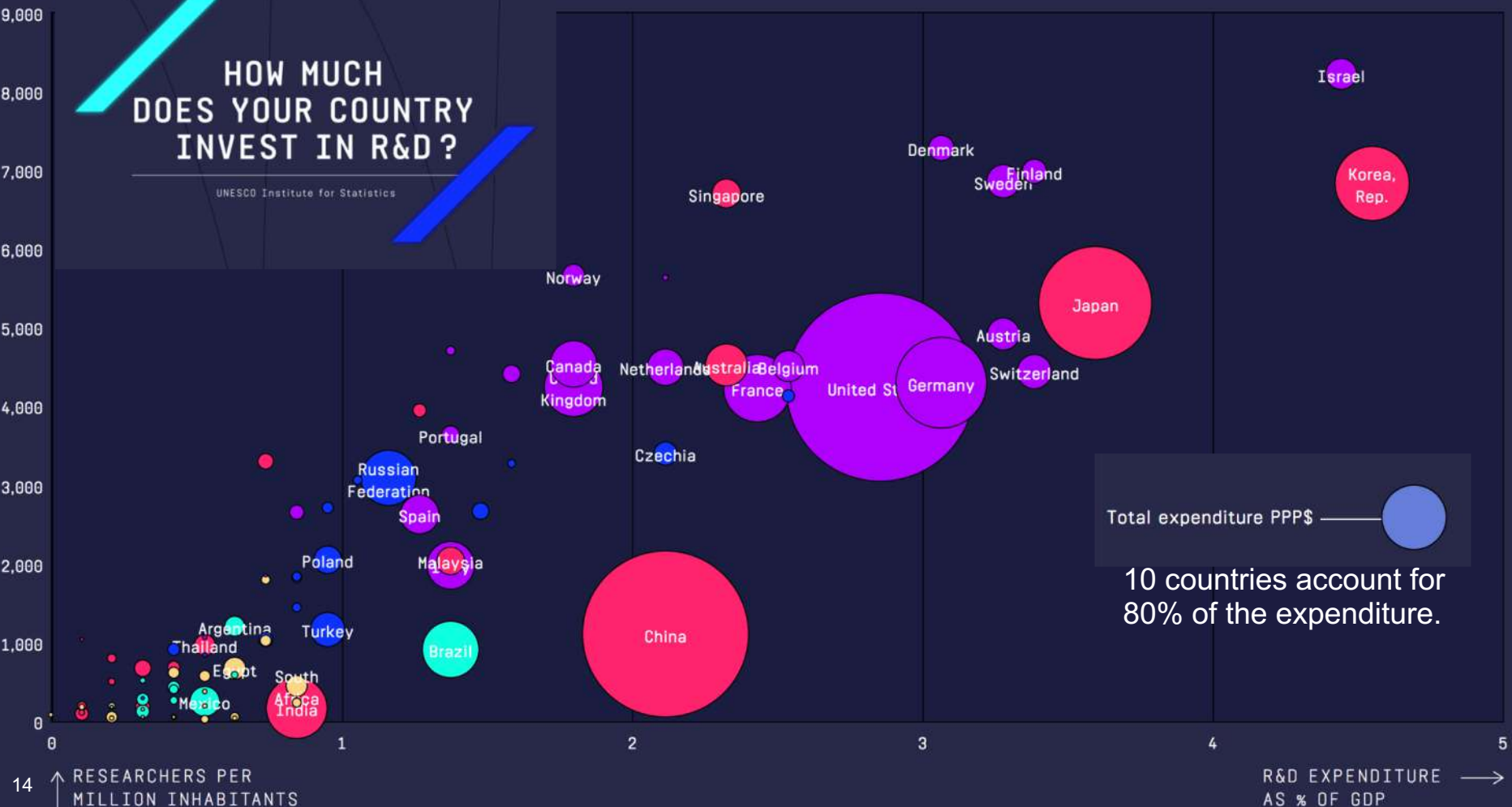
10 countries account for 80% of the expenditure.

Example

Due to a lack of women researchers in leadership or decision making positions

Gender breakdown of medical students, doctors, and specialists, 2014

Kuhlmann et al. Human Resources for Health (2017)

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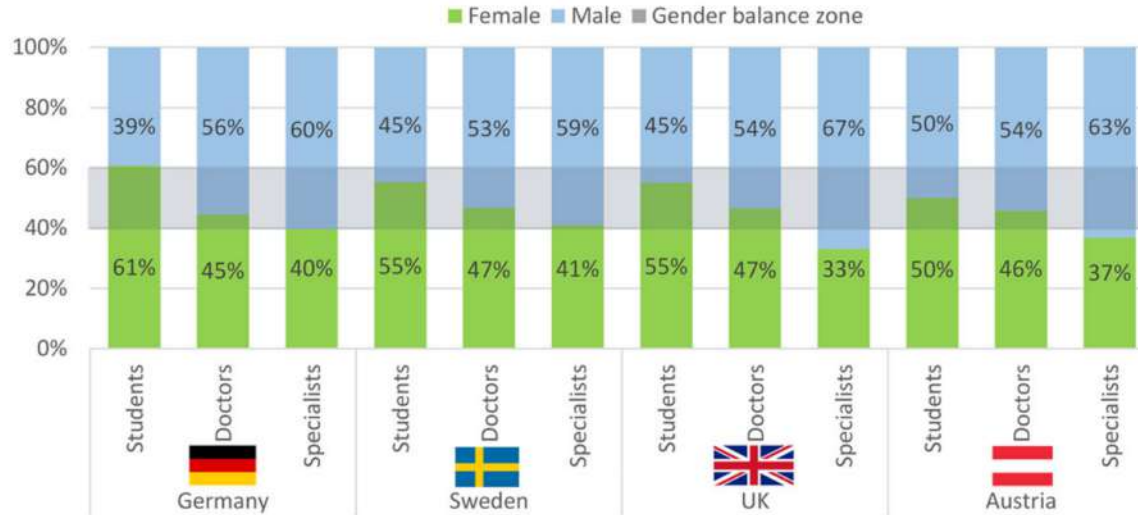
Example

Due to a lack of women researchers in leadership or decision making positions
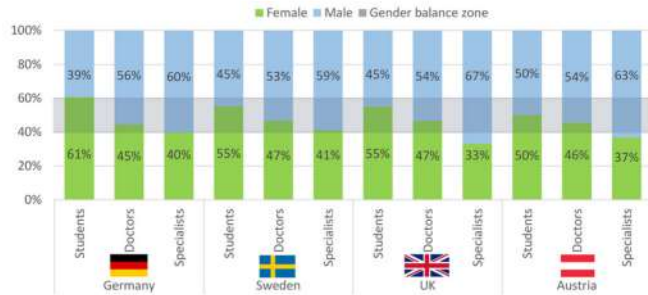
Gender breakdown of medical students, doctors, and specialists, 2014
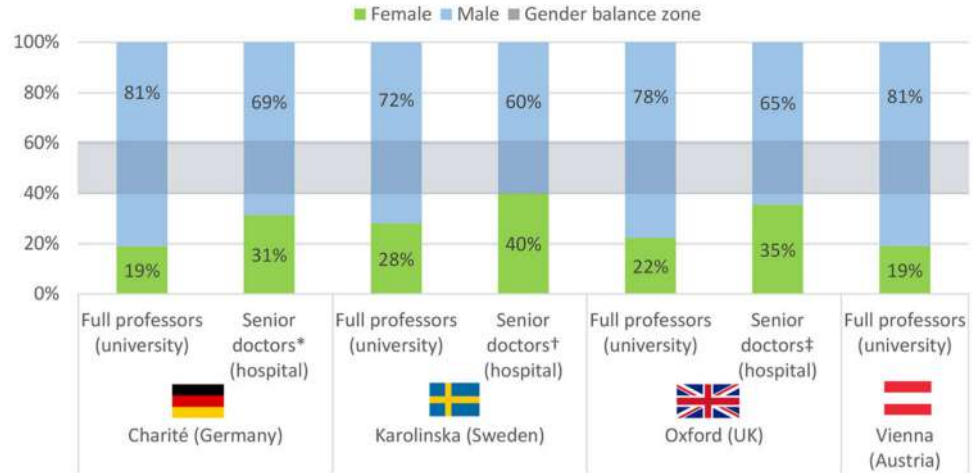
Gender breakdown of full professors and senior doctors, 2014

20. September 2018

Kuhlmann et al. Human Resources for Health (2017)

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Example

Due to underrepresentation of people from minority groups in the global community such as LGBTQIA+ and developing/lesser-developed countries

- 3% women
- 95% men
- 1% non-binary
- 16% ethnic/national minorities
- 8% members of LGBT community
  - 1% identify as transgender
- 26% immigrants (from/to anywhere)

Fig2. - Negative behavior in open source
Source: opensourcesurvey.org
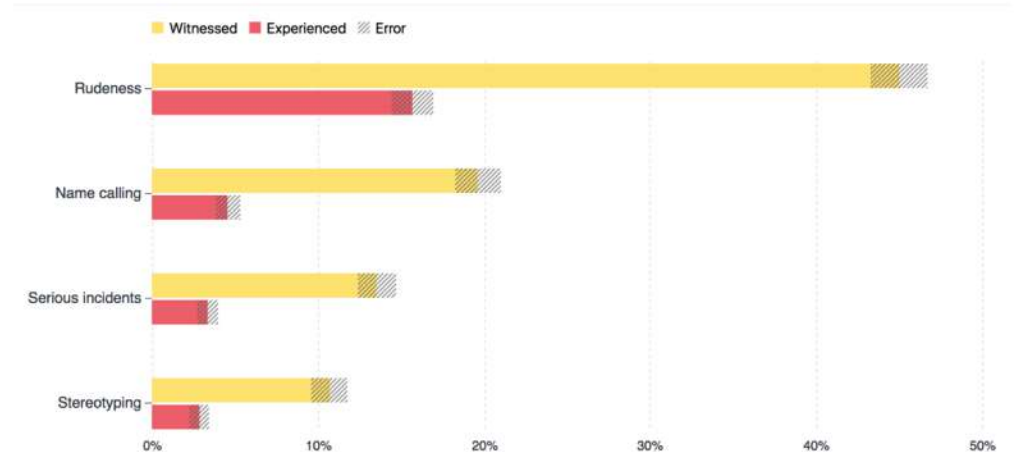
Legend: Witnessed | Experienced | Error

Rudeness
Name calling
Serious incidents
Stereotyping

0%   10%   20%   30%   40%   50%

http://opensourcesurvey.org/2017/

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What are the standards in Open Science
and how to better achieve them?

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https://unsplash.com/photos/GoqEgxAgQw0

1. <u>Research focus and policies</u> fit differently in different social structures

'Inclusion and accessibility can, at times, be difficult to harmonise. There is a gradient of how open one can be, or can afford to be, depending on circumstances, and that every contribution to Open Science, whether big or more moderate, is welcome and significant.'*

— Laurent Gatto, Asst. Prof., Belgium

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1. *Research focus and policies* fit differently in different social structures

What we have → **What we want**

Open Science policies
are often established in
developed countries

…a gradient of policies
that fits the culture and
economy of a country

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1. _Research focus and policies_ fit differently in different social structures

- Many common concerns
  - copyright legislation, funding, quality of education and scientific output, need of supportive policies etc.

- Every country determines its own model of Open Access

https://www.scienceeurope.org/coalition-s/

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1. *Research focus and policies* fit differently in different social structures

Examples from developing countries (BRICS)

- Brazil maintains a globally acclaimed platform for OA journal publishing (sciELO)

- Publicly funded research in Russia are freely disseminated (limitations!)

- >50% of Indian journals are OA and more supportive policies are being developed

- China transformed independent print journal into digital freely available products

- The government policy in South Africa puts the focus on institutional repository

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2. *Researchers make their findings available through <u>Scholarly communication</u>*

'Openness allows for scholarship to take place as a real conversation that is not only open in access but also in scope of ideas and topics, participation, open in terms of the voices represented. Open scholarship allows for previously silenced voices and discussions to be heard.'
– April Hathcock, scholarly communication librarian, opening up the margins (2016)

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2. *Researchers make their findings available through <u>Scholarly communication</u>*

What we have ➡️ **What we want**

A gap between researchers and "outsiders" who can benefit from their work

…scholarly communication by involving researchers, citizens, policymakers, funders, etc.

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2. Researchers make their findings available through _Scholarly communication_

Scholarly communication allows us to:

- understand the relevance of a research

- access scientific information and educate ourselves

- open scholarly discourse up to all the stakeholders

  - Researchers, citizen, funders, policy makers etc.

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3. _Training_ is important to scale the number of people with produced data

'We can democratize data skills by answering more questions, engaging a more diverse set of researchers and develop more creative approaches. Everyone wins!'

– _Tracy Teal, Director of The Carpentries, SciPy18_

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3. _Training_ is important to scale the number of people with produced data

What we have ⟶ What we want

Data and tools are available
but only few care about
passing the required skills

…reward developers for
creating training resources to
help others use their tools

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3. _Training_ is important to scale the number of people with produced data

Researchers and their unmet needs

☑ Understand the research problem

☑ Have the ability to learn new things

☑ Motivated to answer the questions

☐ Have computational skills

Slide shared by Tracy Teal, Director of The Carpentries

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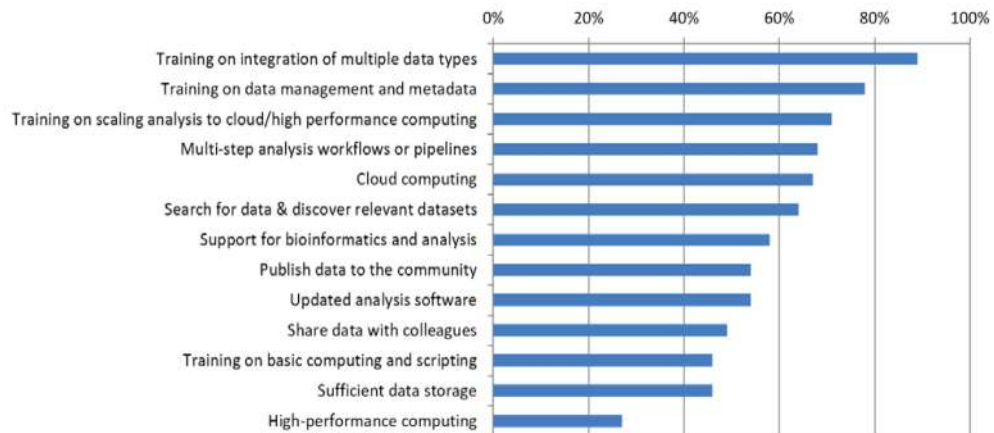
Slide shared by Tracy Teal, Director of The Carpentries

Barone L, Williams J, Micklos D. 2017, **Unmet Needs for Analyzing Biological Big Data: A Survey of 704 NSF PI**

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4. *Community thrives on <u>diversity</u> and participation from all its members*

'Access is not only about being able to read the content but is about being able to have a voice and shape the direction of disciplines. Something is open when it manages to be inclusive of all of the people, voices, and institutions that want to participate. '

– Juan Pablo Alperin, FORCE16, Interview: Open Access as inclusion, 2016

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4. *Community thrives on <u>diversity</u> and participation from all its members*

What we have ➡️ **What we want**

Open Science advocates

defining and practicing

Open Science principles

…ensure participation

from marginalized groups

when making decision

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4. *Community thrives on <u>diversity</u> and participation from all its members*

- Conferences, collaborations and events are the effective tools
  - Inclusive topics, sessions, Code of Conduct, diversity statements, support grants

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Open Science is a Privilege

.@tracykteal: Quoting Fernando Perez at #GCCBOSC - "When people are expected to work on open source for free, only people who can afford to work for free can participate." #SciPy2018

7:32 AM - 12 Jul 2018

Fernando Perez, Asst. Prof, UC Berkeley Stats, Jupyter Project

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A few examples from my work

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European Molecular Biology Laboratory (EMBL)
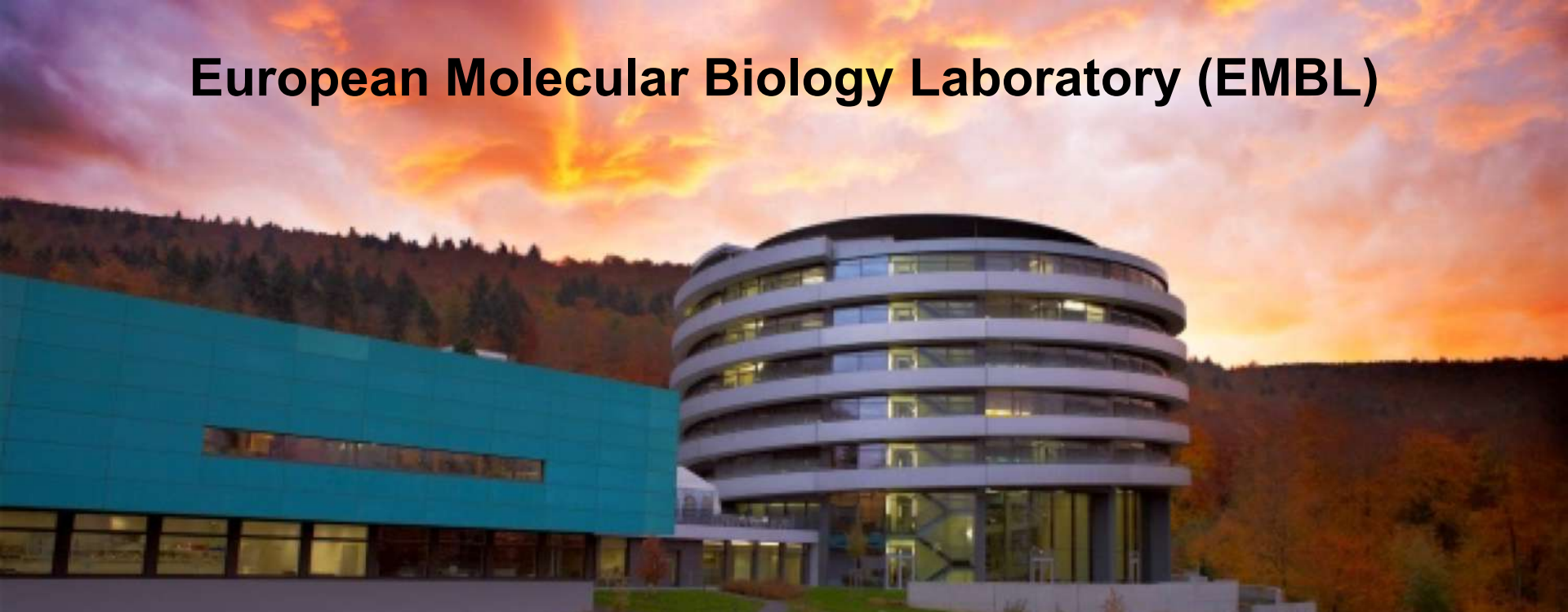
EMBL is a Flagship in Europe that serves as a model for organisational structure in other research institutions

Image copyright: EMBL

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EMBL Member States

Member States 24

Austria 1974	Switzerland 1974	Ireland 2003
Denmark 1974	United Kingdom 1974	Iceland 2005
France 1974	Finland 1984	Croatia 2006
Germany 1974	Greece 1984	Luxembourg 2007
Israel 1974	Norway 1985	Czech Republic 2014
Italy 1974	Spain 1986	Malta 2016
Netherlands 1974	Belgium 1990	Hungary 2017
Sweden 1974	Portugal 1998	Slovakia 2018

Associate Member States

Australia 2008
Argentina 2014
India 2018

Prospect Member States

Poland 2014
Lithuania 2015

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Bio-IT – *Bioinformatics community platform in EMBL*

20. September 2018

Image by: Toby Hodges, Bio-IT, EMBL
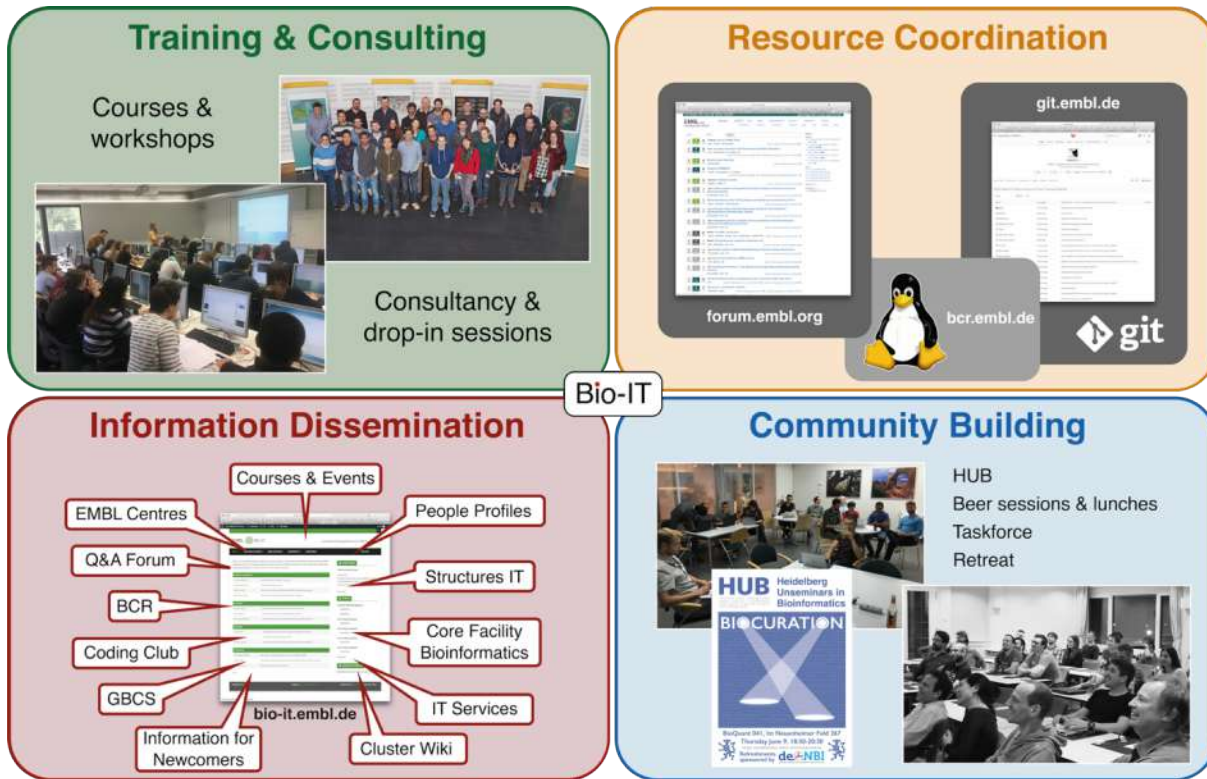
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Bio-IT – *Bioinformatics community platform in EMBL*

3. Training

1. Bioinformatics research

2. Information sharing

4. Diversity

20. September 2018

Image by: Toby Hodges, Bio-IT, EMBL

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Local Bioinformatics Community

Informal open events on science and related topics

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International Computational Community

Foundational coding and data science
skills for researchers worldwide

Basic lab skills for
scientific computing

Skills to work effectively
with Open Access data

For Library
Professionals

EMBL

THE CARPENTRIES

>1400 workshops

>37000 learners
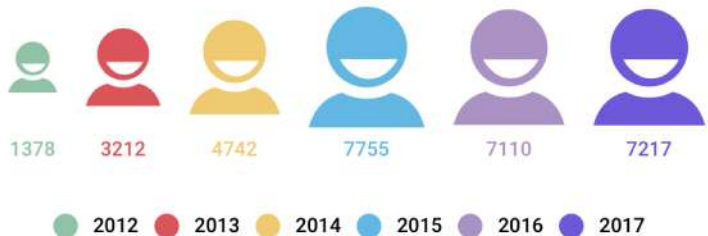
> 1500 instructors from 44 countries

Data and images by Kari Jordan, Director of Assessment and Community Equity

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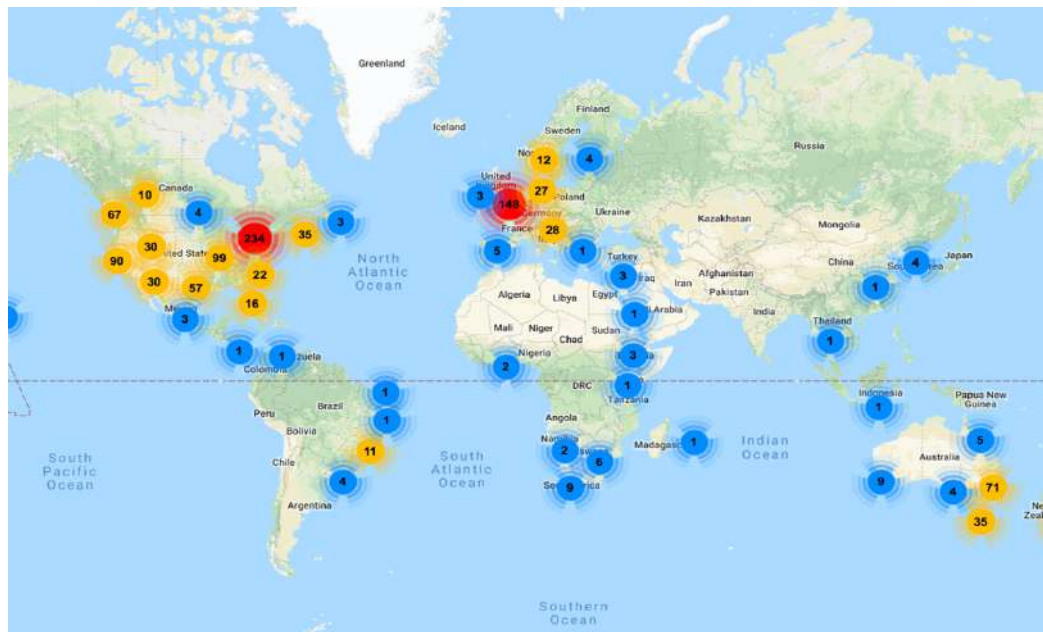
Co-organized the 1st CarpentryCon conference for 125 international members

"Feeling of belonging!"

"We are all nerds wanting to help each other."

Join us as trainer, mentor, mentee, developer …
https://carpentries.org

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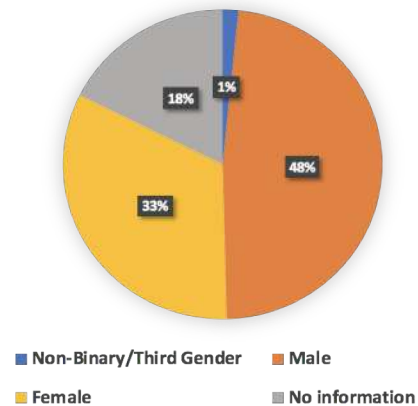
Support at institutional, national and international level

- Combining resources to create opportunities and build sustainable community
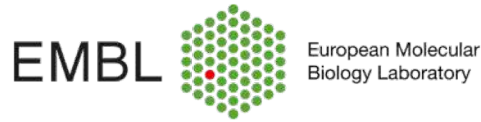
My notes on promoting inclusiveness

https://unsplash.com/photos/5bYxXawHOQg

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Actively share knowledge with others

44   20. September 2018

https://unsplash.com/photos/chuzevDl4qM

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There are several ways!

- Develop sustainable tools

- Create accessible resources

- Create learning materials

- Teach a skill

- Learn about policy (specially about the different groups)

- Support pro-Open-Access movements

- …

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Support, recommend, acknowledge, advertise, nominate and motivate each other.

Be an Ally.

20. September 2018

Ally: a member of a social group that enjoys some privilege that is **working to end oppression** and **understand their own privilege**

Actions

Valerie Aurora

Ally Skills Teacher @frameshiftllc

Privilege: an <u>unearned</u> advantage given by society to some people but not all

Oppression: systemic, pervasive inequality that is present throughout society, that benefits people with more privilege and harms those with fewer privileges

20. September 2018

Slide source: Valerie's talk: "Focus on Ally"

Shape the culture by engaging with your community

20. September 2018   https://unsplash.com/photos/DoA2duXyzRM

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"I do not want to look like an outsider who is talking about things that do not concern me," she says. And although she is happy to be able to conduct research as part of her job, she would also like to see more scientists take the initiative to give back to their communities and "not think that it's someone else's task," she says. Ideally, she continues, everyone would do a bit of community management.

Building community as a career

By **Maggie Kuo** | Feb. 13, 2018 , 4:15 PM

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Welcome new perspectives to make Open Science *really open*.

20. September 2018

https://unsplash.com/photos/tEgFUAEIrnQ

Acknowledgements

Email: sharan@embl.de, malvikasharan@gmail.com. Twitter, GitHub: @malvikasharan

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This world is ours to inhabit and touch. These lives are ours to realize. These roles and social constructs are ours to choose, embrace, reject or modify. Slowly, surely, we are winning the culture war. Nurture and be nurtured, do your best, reach out, be kind, give aid, seek aid. You can do this.

– Sofia K. Forlund, Group leader, MDC/Charite

Dr Sofia K Forslund
@inanna_nalytica Follows you

Scientist (computational biologist).
Liberal. Queer feminist. Transgender.
Ethically non-monogamous.

◎ Berlin, Germany
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