Workshop: Data-driven citizenship for young leaders

Stefania Oikonomou, Katerina Zourou, Web2Learn

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Web2Learn: +10 years innovating in citizen science

- Greek **R&D** company.
- Established in 2014.
- Content and services on
  - digital education/ e-learning
  - citizen science and citizen engagement in research
  - educational software development
- **Active in EU grants** (more than 40 projects funded under Erasmus+, Horizon Europe, national funds).

Experts in professional training, citizen science, open science and social innovation

16 ongoing projects

> 3000 learners

Sectors: Higher Education, VET, School Education, Adult Education

Scope of today's workshop

Enhance your understanding on citizen science and the power of data repositories as means to address and advocate for socio-environmental issues.

Plan

- Presentation: Introduction to citizen science.
- Group activity: 8 student teams, duration: 40 minutes. 1min presentation per team half-way through your teamwork.
- Teams' presentations at the plenary and final remarks.

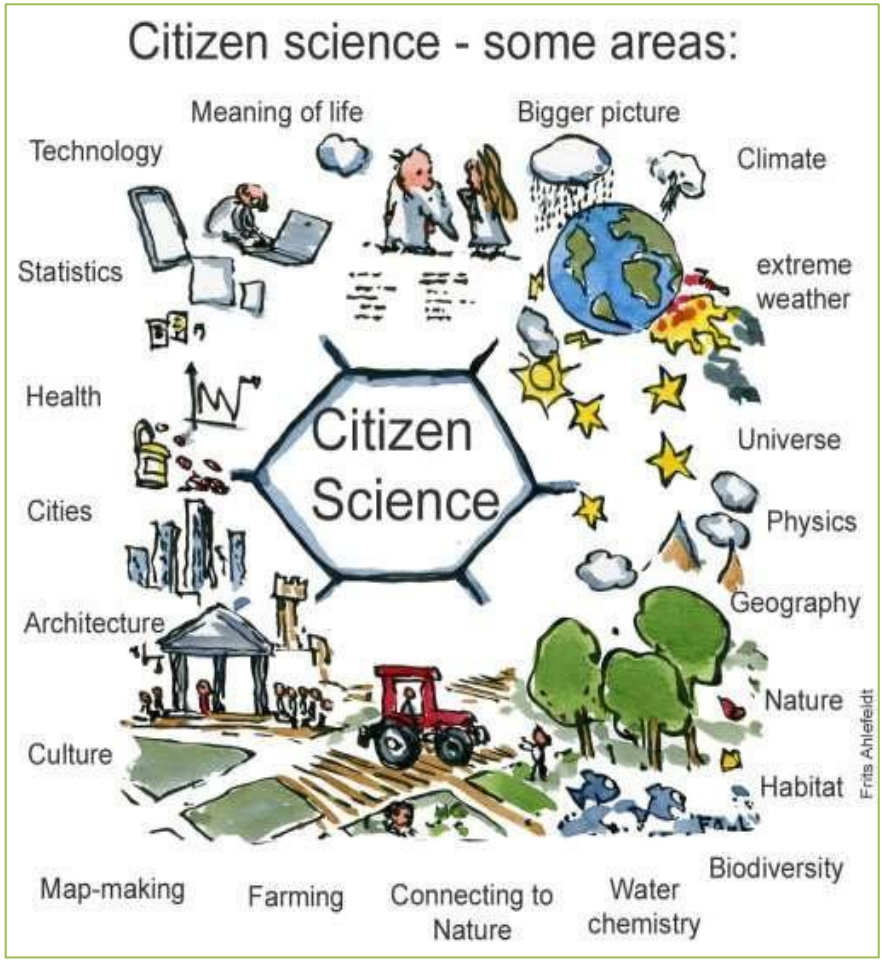
Icebreaker

Say your name, and what is the **first word** that comes to your mind when you hear the words:

- Nerds Without Borders
- Citizenology
- SciSquad
- The Observati

Definition

- Collective actions that bring together **ordinary people** and **scientists**.
- Citizen groups collaborate with the scientific communities by providing **observations, data and/or analysing them**.
- Citizens **collect and analyse data**, interpret and share research results. (Environmental Protection Agency, 2021).
- **10 principles of CS** (ECSA, 2015).



Background

18th century

Citizens observing nature & sky

20th century

CS defined by Alan Irwin (UK) & Rick Bonney (USA) in ‘90s

21st century

Mainstreaming in grassroots communities schools, universities, policies

Sources:

a. UCL History of citizen science.
b. NASA. Citizen Scientists of History

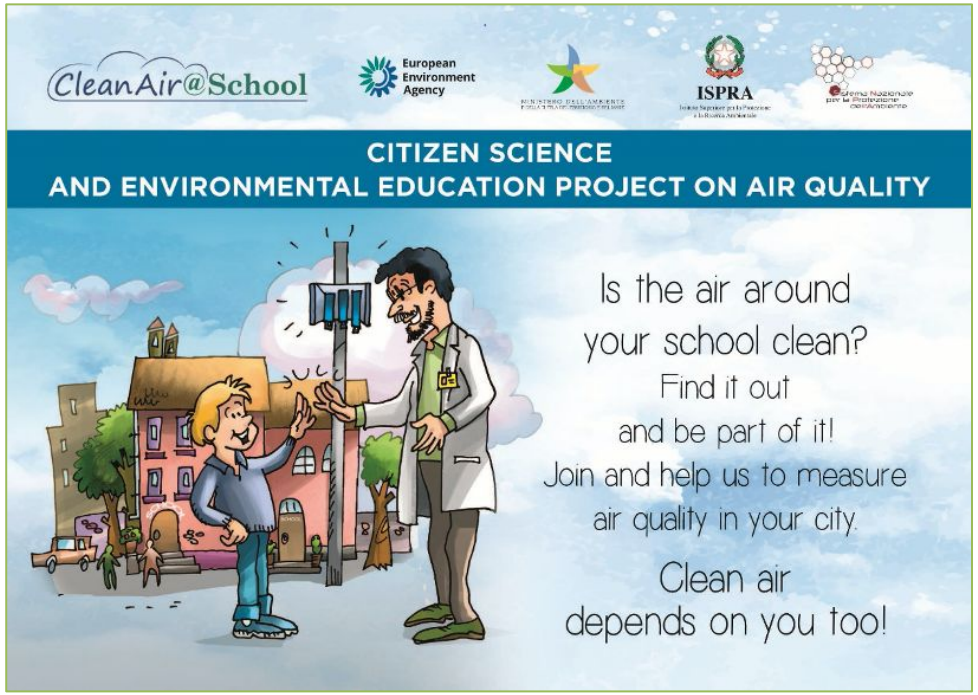
Why it matters?

- An empowering pathway for both **citizens** and **science** built through public participation in scientific research. **People become agents and advocates of scientific breakthroughs!**
- **Multipurpose potential of CS:**
  a) advancing research;
  b) combating misinformation;
  c) fostering active citizenship and citizen advocacy;
  d) opening up science to society.

#1: Air quality monitoring

Wide school participation

- CleanAir@School initiative
- A CS project to understand **children's exposure to NO_2**, in the school environment.
- **Schools monitor air quality** using NO_2 passive samplers, with at least two sampling points located at each school
- Initiative of the European Network of the Heads of Environmental Protection Agencies (2018-2020).
- Website: https://www.green-scent.eu/cleanairschool/

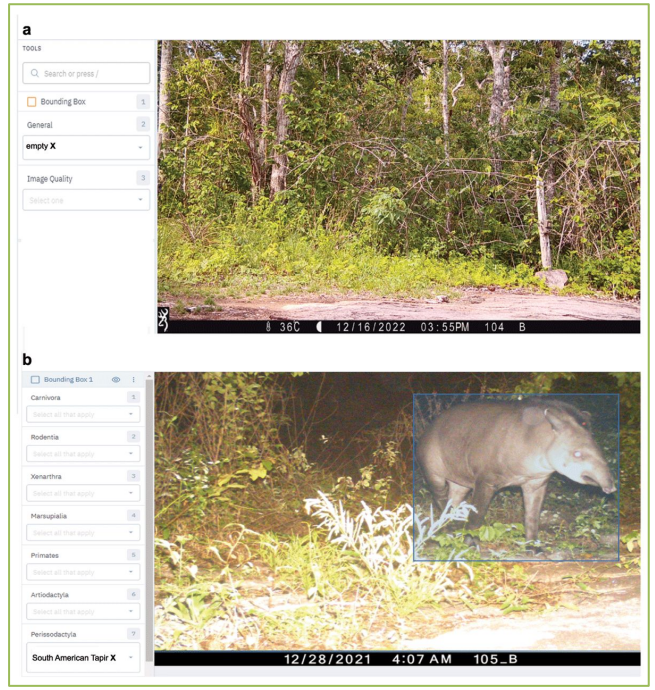


Source: European Environmental Agency. (2019). Assessing air quality through citizen science.

#2: Biodiversity monitoring

Remote (safe) observation and data collection

- WildLIVE project (2020-2023)
- Aim: “Participants, **remotely**, analyze images from a camera trapping project in Bolivia to **investigate the impacts of shifting environmental factors on wildlife**”.
- Process: “Upon registration, participants gain access to view the camera trap images online [..] and **assigning them to predefined categories** or annotations”.



- Source: Jansen et al. (2024). Engaging Citizen Scientists in Biodiversity Monitoring: Insights from the WildLIVE! Project. Citizen Science: Theory and Practice, 9(1), 6. https://doi.org/10.5334/cstp.665

Questions?

Image by pixabay

The role of data in CS

Image by pixabay

Citizen-generated data: Challenges and opportunities

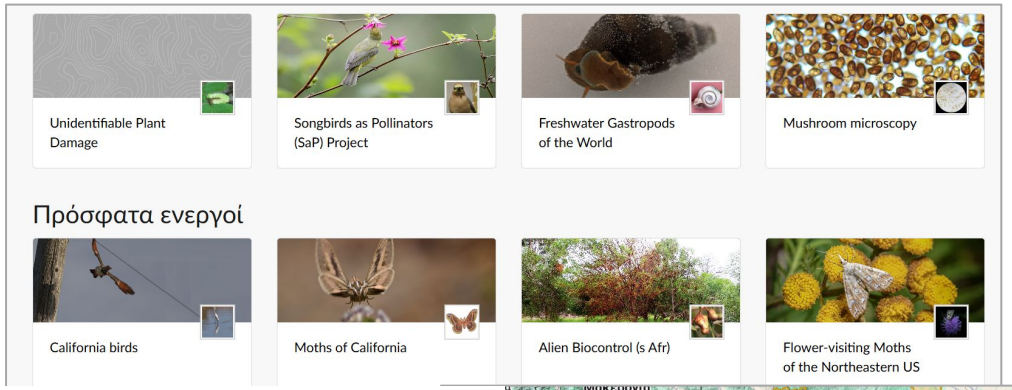
- Citizen science projects actively involve citizens in **scientific endeavour** that generates new **knowledge** or understanding (1st principle of CS, ECSA, 2015).
- Citizen-generated data challenges:
  - data accuracy
  - privacy and access
  - biases, ethics
  - legal aspects (recognition in courts, etc.)
- Citizen-generated data benefits:
  - Wide pool of data → new knowledge, faster accumulation of data and observations.
  - Shed light on scientific areas where official monitoring mechanisms are limited or have no access.
  - Public participation and trust in science.

Sources: ECSA, 2015; Aceves-Bueno et al., 2017; de Sherbinin A. et al. 2021

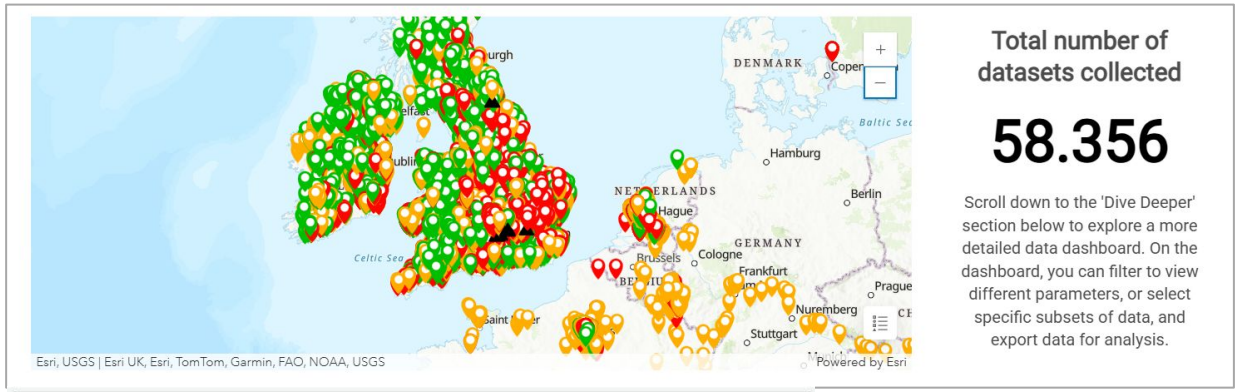
Open access data repositories

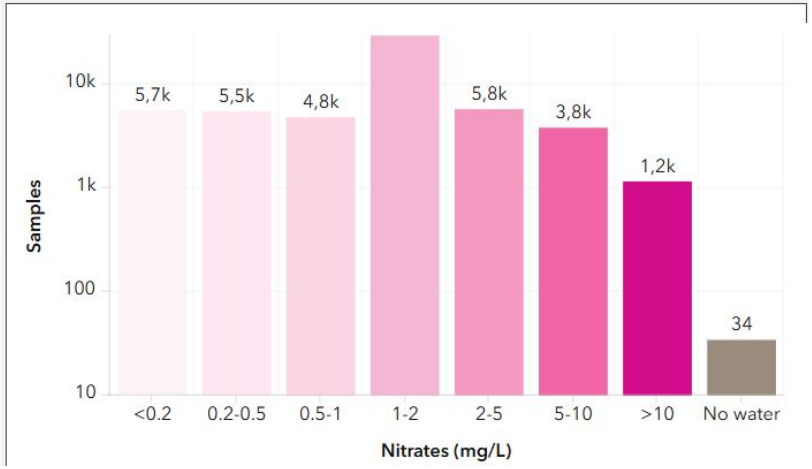
#1 Thematic area: Environment

- iNaturalist



- Great UK WaterBlitz by EarthWatch

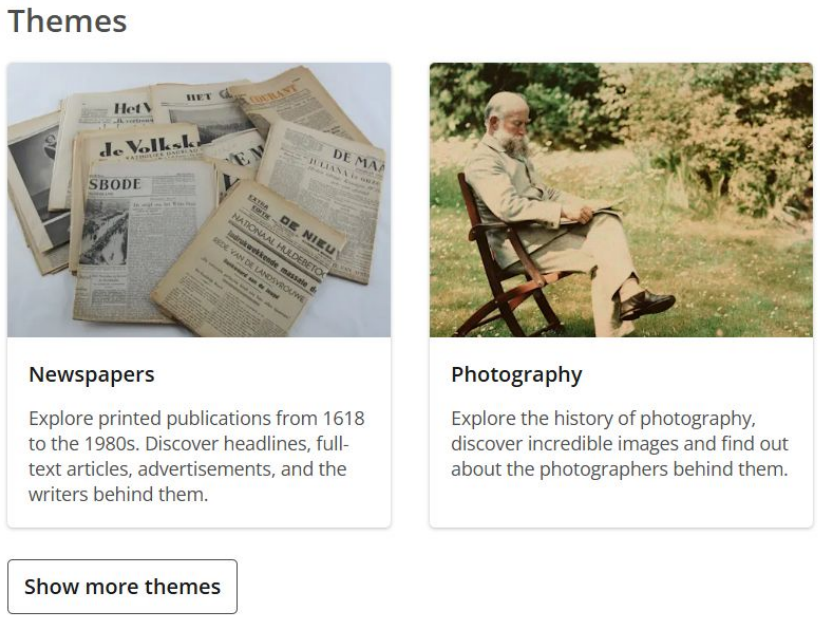


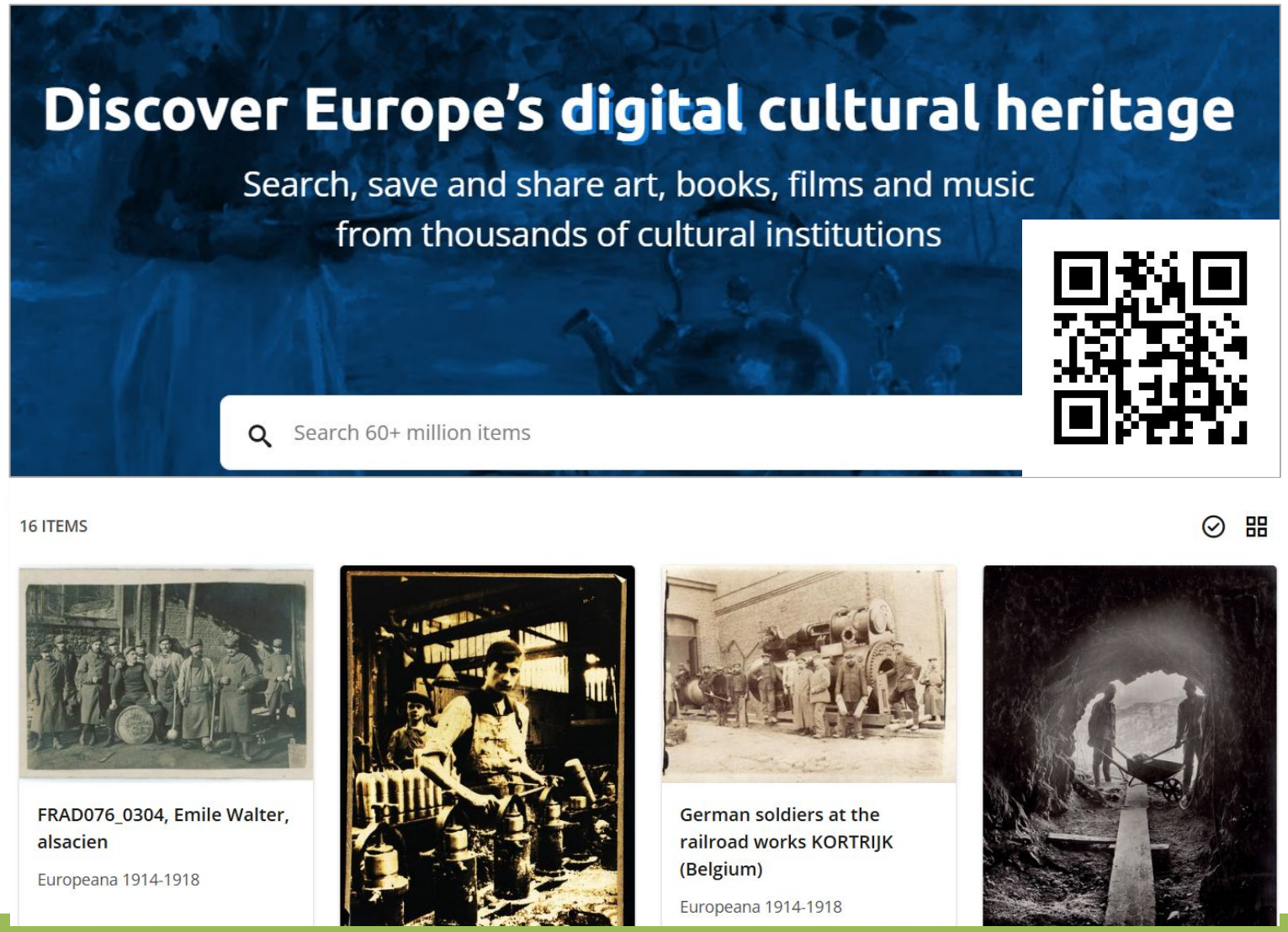


#2 Thematic area: Culture

Europeana:

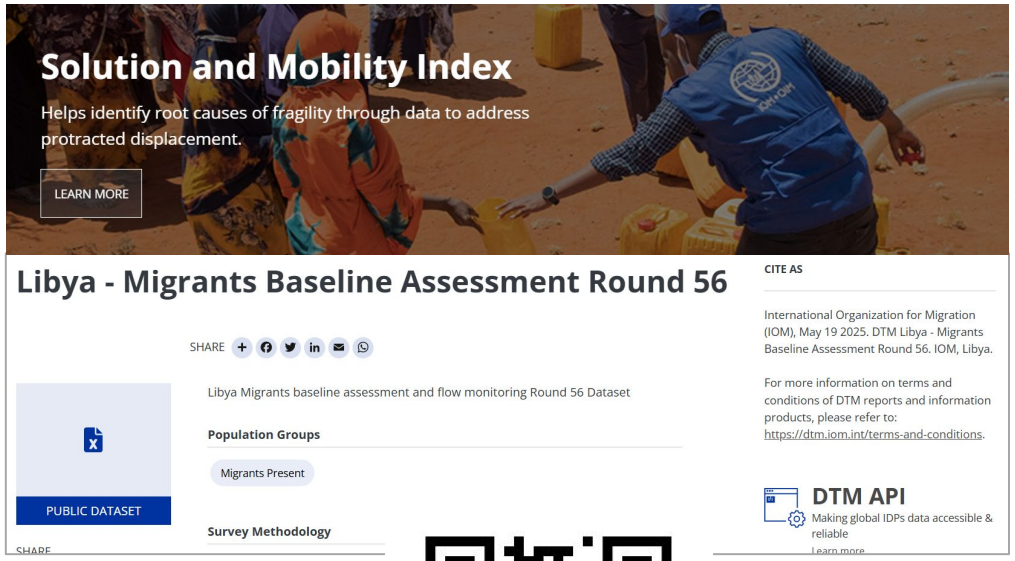
- >60mln items
- Crowdsourced collections





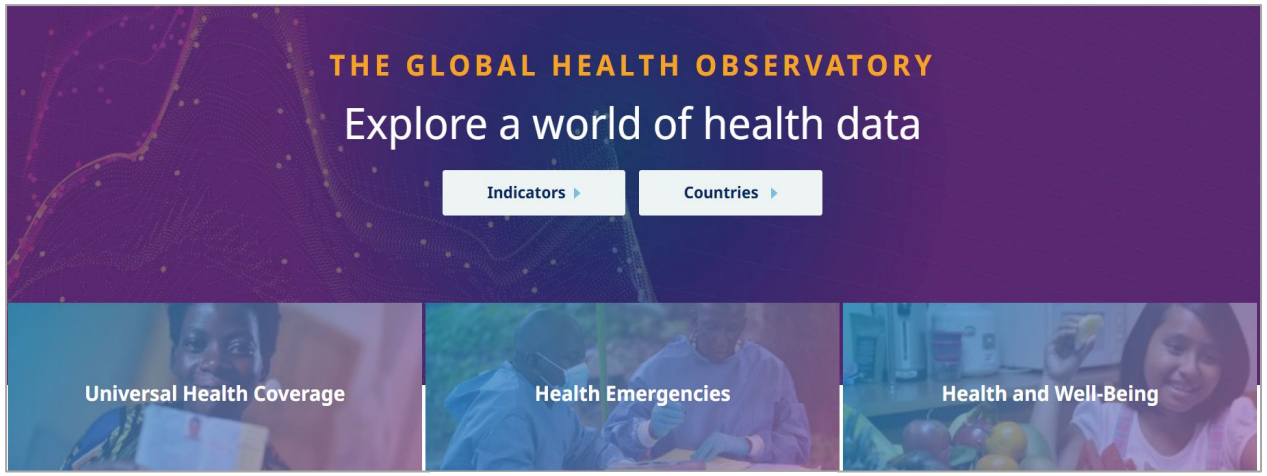
#3 Thematic area: Refugees

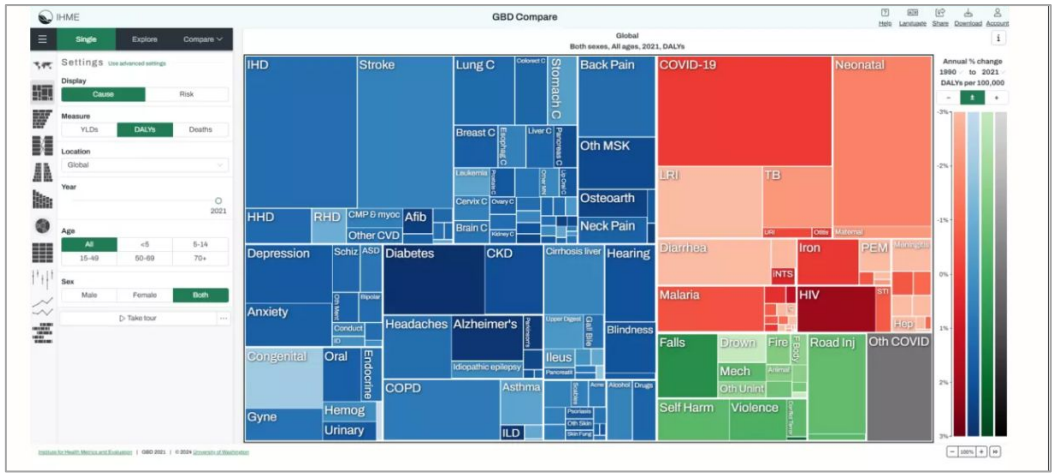
- United Nations High Commissioner for Refugees (UNHCR)
- International Organisation for Migration (IOM)



#4 Thematic area: Health

- World Health Organisation (WHO)
- Global Burden of Disease (GBD)





Group activity

Image by pixabay

Instructions

- Pick a thematic area and a subtopic of it (e.g. Air quality under the Environment thematic area).
- There will be **2 groups working per thematic area**, in a different subtopic. **Total: 8 student groups**.
- 1 rapporteur per group to present:
  - for 1min at 16.10pm.
  - for 3mins at the end of the group activity (16.30pm)
- **Duration**: 40 minutes

Thematic areas

#1 Environment, data repositories:

- iNaturalist: https://www.inaturalist.org/observations
- EarthWatch WaterBlitz: https://www.freshwaterwatch.org/pages/great-uk-waterblitz-results

#2 Culture, data repositories**:**

- Europeana https://www.europeana.eu/en/collections and its search engine https://www.europeana.eu/

#3 Refugees, data repositories**:**

- United Nations High Commissioner for Refugees (UNHCR): data.unhcr.org/en/situations
- International Organisation for Migration (IOM): https://dtm.iom.int/

#4 Health, data repositories**:**

- World Health Organisation (WHO): https://www.who.int/data/gho
- Global Burden of Disease (GBD): https://www.healthdata.org/research-analysis/gbd

Instructions

- Design your citizen science project, building on the following features:
  - Title
  - Scope
  - Context: (location, participants, time frame).
  - Dataset.
  - Action plan (a draft list of steps and actions to carry out).
  - Advocacy-outreach measures.

Planning questions

- What kind of problem is your citizen science project going to address?
- What do you want to achieve through the project?
- How are you going to use the datasets at your disposal?
- What is the role of technology in your project?
- How do you plan to communicate and disseminate your project and its results?

Considerations:

- Data (misuse, fake news, misinformation, biases)
- Technology (access, costs, security)
- Ethics and privacy.
- Languages, including less spoken languages that many refugees speak
- Cultural barriers, gender, diversity.

Mid-group activity team presentations

1 minute per team

Presentation of results

3 minutes per rapporteur to present your project

Image by pixabay

Key takeaways

- Citizen science a means for **social empowerment**, **advocacy** and scientific advancements.
- Focus on **data** → challenges but also benefits!
- Young leaders and citizen science projects:
  - knowledge: principles of citizen science and inclusive practices.
  - skills: teamwork; communication; collaboration.

"The only source of knowledge is experience"

Albert Einstein

References

1. ECSA (European Citizen Science Association). (2015). Ten Principles of Citizen Science. https://doi.org/10.17605/OSF.IO/XPR2N
2. Aceves-Bueno, E. et al. (2017). The Accuracy of Citizen Science Data: A Quantitative Review. Bulletin of the Ecological Society of America, 98(4), 278–290. http://www.jstor.org/stable/90013289
3. de Sherbinin A, et al. (2021) The Critical Importance of Citizen Science Data. Front. Clim. 3:650760. doi: 10.3389/fclim.2021.650760
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