Questionnaire for UNESCO Open Science Recommendation

More info
Online survey
Towards a UNESCO Recommendation on Open Science
about the GYA + UNESCO (links by Véronique in the Skype):
http://www.iicba.unesco.org/?q=node/304
https://globalyoungacademy.net/events/world-science-forum/
https://globalyoungacademy.net/national-young-academies/
https://globalyoungacademy.net/gya-in-brief/

CONTEXT OF SURVEY PROVIDED BY UNESCO

The Open Science movement has emerged from the scientific community and has rapidly spread across nations, calling for the opening of the gates of knowledge. Investors, entrepreneurs, policy makers and citizens are joining this call.

However, in the fragmented scientific and policy environment, a global understanding of the meaning, opportunities and challenges of Open Science is still missing.

UNESCO, as the United Nations Agency with a mandate for Science, is the legitimate global organization enabled to build a coherent vision of Open Science and a shared set of overarching principles and shared values. That is why, at the 40th session of UNESCO's General Conference, 193 Member States tasked the Organization with the development of an international standard-setting instrument on Open Science in the form of a UNESCO Recommendation on Open Science.

The Recommendation is expected to define shared values and principles for Open Science, and identify concrete measures on Open Access and Open Data, with proposals to bring citizens closer to science and commitments facilitating the production and dissemination of scientific knowledge around the world. It will be developed through a regionally balanced, multistakeholder, inclusive and transparent consultation process.

The purpose of this questionnaire is to conduct an electronic consultation with stakeholders in view of providing inputs into the UNESCO Recommendation Open Science.

The questionnaire is available online at
https://en.unesco.org/science-sustainable-future/open-science.
direct link: https://www.surveymonkey.com/r/N958HFW

For any further information, please contact the UNESCO Secretariat at
openscience@unesco.org

Questionnaire for inputs into the development of the UNESCO Open Science

eurodoc

The European Council of Doctoral
Candidates and Junior Researchers

Recommendations

EURODOC answer proposal

Participant Information

1. Name of the institution: European Council of Doctoral Candidates and Junior Researchers (Eurodoc)
2. Country: Belgium
3. Geographical coverage of the institution: National Regional International
4. Field: All research
5. Your name: Eva Hnatkova
6. Email: president@eurodoc.net
7. Position: President of Eurodoc
8. Age: ≤35 36-45 46-60 ≥61
9. Gender: Male Female Other

QUESTIONS

A) On the meaning and practices of Open Science

10. How familiar you are with the Open Science concept?
- I am not aware of it
- I am aware of it but I am not involved in Open Science practices
- I practice Open Science
- I actively promote Open Science

11. If applicable, in which way do you practice and/or promote Open Science?

Eurodoc is a federation of national associations (NAs) representing early-career researchers (ECRs) from 26 countries in Europe. We have been supporting the concept of Open Science (OS) for a long time by providing policy recommendations, organizing international and local events for ECRs (conferences, workshops, webinars) or running surveys in collaboration with our NAs. One of our Working Groups is fully dedicated to OS. Our representatives contribute to public debate via social media, higher education and science press.

Eurodoc aims to contribute to the development and implementation of OS policies, ensuring that the needs of ECRs are taken into account. We advocated at national and European level about OA, Plan S, Copyright and the importance of OS in EU funding programs. We collaborate with key stakeholders such as Directorate General for Research and Innovation of the European Commission (EC), European University Association (EUA), Science Europe and cOAlition S.

Because Eurodoc considers OS training important, in 2019 we train 24 OS ambassadors among ECRs represented in European Countries. These representatives act as ambassadors in their communities and networks at national level. The OS Ambassador Training was prepared in collaboration with experts from various fields and was supported also by FOSTER portal. The course consisting of 10 modules is now freely available for all interested researchers and policy makers.

We are further involved in various EU projects promoting OS. One of them is Open Research Europe - a new OA Publishing Platform of EC that will offer peer-reviewed publishing service for beneficiaries of H2020 and Horizon Europe. The project is coordinated by F1000Research and Eurodoc together with the Association of European Research Libraries (LIBER) and Global Young Academy (GYA) is part of it. We will organize training sessions and webinars to explain the platform to ECRs, and gather feedback and recommendations through focus groups.

12. Does Open Science have a clear definition for you?

Yes Not completely Not at all

13. What is your understanding of Open Science?

OS can have many definitions. The concept is still under development and needs to be further refined and adopted by the research community globally. For Eurodoc, OS is generally the new way of conducting research by opening up access to research data and outputs via new digital technologies and collaborative tools, entailing a systemic change to the way science and research is done, communicated and evaluated. We follow the European Commission in its use of the OS concept in the full meaning of Open Scholarship.

OS is essentially an umbrella term for various practices such as Open Access, Open Data, Open Methodology, Open Source, Open Peer Review, Open Education, Alternative Metrics and Citizen Science. Eurodoc considers Open Access and Open/FAIR Data the two main pillars of OS. By opening research data / other outputs we consider the principle "As open as possible, as closed as necessary", taking into account the need to balance openness and protection of scientific information, commercialization and intellectual property rights, privacy concerns and security.

The aim is to open up the entire research cycle so that research designs, methods, data, and results are publicly available and reusable in a reasonable timeframe. It makes all phases of the research process more transparent and accessible, thus boosting social and scientific discussions, technological development and innovation. OS also promotes research integrity and enables a more accurate assessment of scientific production quality, contributing to more

eurodoc

The European Council of Doctoral
Candidates and Junior Researchers

info@eurodoc.net
http://www.eurodoc.net
Rue d'Egmont 11, Brussels

fair approaches in career development and research funding.

Opening up access to research is important for all researchers who rely on research data / outputs from other researchers to investigate new developments and discoveries and build upon previous research. This is especially true for academic institutions in lesser developed countries, which may not be able to afford the often high costs for accessing research through commercial publishers.

More inclusive terms such as Open Research and Open Scholarship have also been proposed.

14. Which of the following aspects are relevant to Open Science? Please score

them based on their importance from 0 (not important) to 3 (very important).

- Open access to scientific journals 0 1 2 3 I don't know
- Open access to data 0 1 2 3 I don't know
- Open notebooks 0 1 2 3 I don't know
- Open access to educational resources 0 1 2 3 I don't know
- Open source 0 1 2 3 I don't know
- Open infrastructures (Open labs/Open hardware) 0 1 2 3 I don't know
- Open innovation 0 1 2 3 I don't know
- Open evaluation 0 1 2 3 I don't know
- Open collaborations 0 1 2 3 I don't know
- Crowdsourcing 0 1 2 3 I don't know
- Co-design of research projects 0 1 2 3 I don't know
- Citizen science 0 1 2 3 I don't know
- Links with indigenous and local knowledge 0 1 2 3 I don't know
- Science outreach and communication 0 1 2 3 I don't know

15. Which of the following aspects of Open Science (if any) are relevant <u>in your</u>

<u>specific field of work</u>? *Please score them based on their importance.*

- Open access to scientific journals 0 1 2 3 I don't know
- Open access to data 0 1 2 3 I don't know
- Open notebooks 0 1 2 3 I don't know
- Open access to educational resources 0 1 2 3 I don't know
- Open source 0 1 2 3 I don't know
- Open infrastructures (Open labs/Open hardware) 0 1 2 3. I don't know
- Open innovation 0 1 2 3 I don't know
- Open evaluation 0 1 2 3 I don't know
- Open collaborations 0 1 2 3 I don't know

- Crowdsourcing 0 1 2 3 I don't know
- Co-design of research projects 0 1 2 <mark>3</mark> I don't know
- Citizen science 0 1 <mark>2</mark> 3 I don't know
- Links with indigenous and local knowledge 0 1 2 3 I don't know
- Science outreach and communication 0 1 2 <mark>3</mark> I don't know

16. Which other aspects of Open Science should be taken into consideration?
max 200 words

To take advantage of its full potential, Open Data requires interdependent procedures such as Data Management Plans (DMPs), FAIR data and Data stewardship. DMPs define the whole lifecycle of data and allow a priori definition of correct procedures and data standards. Also, although not all data can be open, it should at least be FAIR (findable, accessible, interoperable, reusable) to allow the use of FAIR tools/services/software (certification is needed). Finally, Data Stewardship is required either as training of researchers or by assigning data experts to research projects, given the often expertise that proper and FAIR data curation require for correct data management.

Other aspects are Open Education (e.g. MOOCs), Open Peer Review, and Open Licensing (copyright issues). DORA and the Leiden Manifesto statements highlight the value and impact of all research outputs (including datasets and software) in addition to publications, and encourage the use of proper metrics in each field focusing research quality and impact. Therefore, Open evaluation of researchers and research outputs is required, through a system of incentives that recognizes OS practices at different levels (researchers, research groups, institutions, and governments/states). The use of tools such as CRediT – Contributor Roles Taxonomy allow a more transparent assignment of authors contribution to scientific outputs.

17. What infrastructures do you think are crucial for implementing open science policies?
(e.g. access to high-speed internet, data repository equipment, etc.)

Digital research environment with remote use and support tools and services is crucial for implementing OS practices. Infrastructures can be both physical and digital, but should always be open, trusted and user-friendly. They must include a harmonised and aggregated catalogue of services, be made inclusive, and tailored to various types of users (different degrees of expertise; different research fields). Training is nevertheless required for higher expertise demands, and should be made available.

- Facilities for research data collection, management, processing, analysing and archiving, and other data services for all disciplines;
- Access to high-performance computer facilities (e.g. to handle large data sets);
- High-speed internet for data upload/processing/download with high security;
- Creation of publications/data/research outputs repositories and cloud services (e.g. European Open Science Cloud, EOSC), ensuring appropriate funds for their

eurodoc

The European Council of Doctoral
Candidates and Junior Researchers

info@eurodoc.net
http://www.eurodoc.net
Rue d'Egmont 11, Brussels

maintenance and management;[1]

- Adequate and robust communications channels and tools, helping researchers to foster international collaborations, and enhance research accessibility, usage, and impact;
- Unique persistent identifiers for researchers (e.g. ORCiD) and research protocols, objects and outputs (e.g. DOIs), to ensure all participants in research, scholarship, and innovation are uniquely identified and connected with their contributions across disciplines and borders;
- Support services (including training, data stewardship).

18. Which of the necessary infrastructures for Open Science are missing in your country?

Researchers are still largely unaware of OS practices and policies, are not receiving training or institutional support for OS, and are not yet using standardised guidelines, metadata, or Data Management Plans (DMPs) to perform OS. OS practises must be integrated in doctoral training programmes. A rewarding system for those who practice OS must be considered internationally for researchers' career development. All researchers should have access to standardised guidelines, training, and support for minimal Research Integrity, Open Access, FAIR Data, Open Innovation, and Citizen Science. Lack of coherent policy on OS is not reserved to institutions but is also apparent at national levels.

Eurodoc, as a federation of national associations representing ECRs in various European countries, points the following missing infrastructures/associated services:

- Data storage services/repositories
- Archiving facilities
- New platforms for innovative scholarly communication
- Innovative and interactive platforms for Curriculum Vitae
- Hub for digital Skills and Services
- New formats for research outputs (e.g. interactive and not just presented in PDF files)
- Education and training on OS practices
- Incorporation of OS practices including research integrity into Doctoral Training programmes
- Data management support
- Metadata description in data
- Data stewards
- Appropriate reward system

19. Are there any capacity building initiatives undertaken in our country to enable Open Science? If yes, kindly indicate what they are and which aspects of Open Science they address.

Yes   Being considered   No   I don't know

Open access to scientific journals
Open access to data
Open notebooks
Open access to educational resources
Open source
Open infrastructures (Open labs/Open Hardware)
Open innovation
Open evaluation
Open collaborations
Crowd sourcing
Co-design of research projects
Citizen science
Links with indigenous and local knowledge
Science outreach and communication
Other:

Given the fact that Eurodoc represents 26 european countries, with various realities in what concerns OS practices and policies, we answered above as "I don't know" to more accurately address differences between countries. We further develop our thoughts bellow.

Most countries in Europe have not yet developed strategic plans to implement OS and may not yet consider OS as a strategic priority. For the open cultural shift to succeed, OS must be encouraged and supported at all levels: governments/states, academic institutions and the researchers themselves, targeting different areas, through a global consensus.

The advocacy of Eurodoc, National Associations and stakeholders is promoting new initiatives on OS. However, to enable ECRs to practice OS is necessary to increase the research funding specifically to promote publications and training on OS. Academic publishers should hereby be encouraged to improve their publication options and reduce the fees for Open Access.

The vision Open to the World of the European Commission will develop more international cooperation and science diplomacy, as well as address core societal issues. Specific grants under the Horizon program aim to create Open Innovation ambassadors, who will bring new actors into the innovation process, creating new products, markets and entrepreneurship.

Nevertheless, we also advocate for the release of funds from other sources, e.g. Nongovernmental Organizations (NGOs), industry, etc, at the international, but also national and local levels, to help raise awareness and promote the acceptance and acknowledgement of an OS system.

20. In your experience, are current Open Science practices beneficial for all the relevant stakeholders in your country?
Yes Partly Not at all I don't have enough information

Do you have any complementary note?

We identify research assessment as one of the main barriers for Early Career Researchers (ECRs) – our focus here. Current research assessment practices do not incentivise/reward researchers for making research outcomes openly available, as incentives/reward structures predominantly focus research outputs. The dominance of Journal level metrics (e.g. Journal Impact Factor, JIF) means that research output is often narrowed to articles published in high-ranking journals.

This is particularly important as research assessment procedures form the basis on which universities and other research-performing organizations manage research recruitment and promotions, performance evaluation of research units, and allocation of research funding within the institution.

ECRs wishing to go open face a lot of obstacles. ECRs need to be sure that they will not be judged narrowly on the number of publications and/or the JIF when assessment/recruitment/funding is taking place. Institutions should also be rewarded at national level by their governments for developing and applying internal policy on OA, FAIR Data and Data Management.

However, more awareness is needed in the research community about how the whole research valorisation system is built and works. For instance, researchers should be made aware that, to practice OS, they may not be able to publish in their preferred journals.

21. In your experience, are the current open science practices beneficial for the scientists and other relevant stakeholders in both developed and developing countries?

Yes Partly Not at all I don't have enough information

Do you have any comments to add?

OS makes scientific research, data and dissemination accessible to all levels/members of society, thus benefiting different stakeholders (e.g. pandemics are a good example of OS benefits).

The idea is that this can be extended to less developed countries or underfunded institutions, which may not be able to afford the often high costs of licencing software, data acquisition and storage, and the access to publications through commercial publishers.

However, OS involves costs, particularly related with infrastructures (e.g. data and publications repositories or platforms) and payment of publications to ensure OA (Article Processing

Charges, APCs). These costs are harder to work for developing countries. Moreover, different accessibility to knowledge and research publication between high-income and low-income universities or research institutions may influence the ability of a country to innovate.

Implementation of OS should account for:

- cultural differences – demographic/age difference, non-native languages obstacles, national idiosyncrasies - require understanding of OS to be treated according national challenges, goals and infrastructures (this is true both within Europe - between Western, Eastern, Southern and Northern countries - and outside Europe);
- differences in national funding system, digital coverage and accessibility/tools availability;
- differences in resources and mobility infrastructures (e.g. train, airplanes, etc).

22. Do you have any concerns about the possible negative impacts of Open Science practices? If yes, please specify

OS can have negative impact due to negligent or malicious use, or due to requiring specific infrastructures, knowledge and practices, which may not be available to all researchers or which put too much effort on stakeholders. It can also have negative consequences due to fear of over exposure, or current cost-benefit trade-off.

For negligent use, we can point to misuse, misinterpretation, and overgeneralization of research findings, and use of non-peer-reviewed publications and data, particularly when lack of proper education and training is a reality. Also, due to underlying differences between research fields (e.g. STEM, Arts and humanities), potential negative impacts arise if the diversity of scientific fields is not enough considered.

By malicious use, we point to big publishers taking advantage of APCs if this is the only model, resulting in decreased quality of research publications and other outputs published. In this transition period, most research institutes have not yet made provisions for the payment of APCs. This therefore entails additional, often substantial, costs for researchers.

Also, the existence of Predatory journals and the emergence of low-quality and false science.

Moreover, we point to privacy issues for data and copyright obstacles of research outputs and data management.

By requiring specific physical and digital tools, infrastructures and knowledge, it may increase the gap between developed and developing countries, or low and high-income institutions, increasing the danger of knowledge becoming exclusive for certain societies. Considering the high price of publishers (e.g. APCs), low-income countries/institutions may not be able to publish their research outcomes. OS appropriate policies may also be missing, together with training.

Finally, Open Peer Review may result in increased likelihood of reviewers declining to review and less critical reviews due to fear of future repercussions, particularly for early-career researchers. It may also result in extra work (time-effort) for researchers, not being currently recognized by a proper reward/incentive system. In fact, in some fields, researchers are rated by their ability to publish in journals with a high impact factor.

B) On Open Science policy

23. Does your institution have an Open Science policy or strategy?

Yes No, but the process has started No I don't know

If yes, please specify.

Eurodoc has worked in the last few years to push the boundaries of Research & Innovation in Europe towards OS.

Our policy and strategy is defined in the following examples: we have developed and implemented a OS Ambassadors Training; we participate in policy shaping initiatives together with other entities at the European level towards OS (for instance Eurodoc state Open Letter to the European Commission to define OS as one of the pillars in EC funding programs; support of Open Access via Plan S, and of European Commission projects such as the Open Access Publishing Platform; also on copyright issues, with signatory of open letter to Members of the Legal Affairs Committee of the European Parliament on EU Copyright Reform, defending full access to research data and publications in repositories to potentiate infrastructures such as the European Open Science Cloud (EOSC)].

Moreover, we actively advocate for the consideration of OS skills and competences as transferable skills for ECRs to increase their employability and support diverse career paths.

For this, we have a strategic partnership with F1000Research, cOAlition S, Science Europe, EUA, and with National associations of early career researchers.

24. Does your country or region have a dedicated institution/entity dealing with Open Science? (EVA)

Yes No, but the process has started No I don't know

If yes, please specify.

Europe, through the European Commission has many entities and institutions working on Open Science matters: the European Commission (Innovation, Research, Culture, Education and Youth division; Open Science Monitor), the European Research Area and Innovation Committee (ERAC), Research Data Alliance (RDA), the GoFAIR initiative (bottom-up, stakeholder-driven

and self-governed aiming to implement the FAIR data principles), the European Innovation Council, and Science Europe (European association of research-performing and research-funding organizations), for a few examples.

25. Does your country or region have a policy or strategy on Open Science? (EVA)
<mark>Yes</mark> No, but the process has started No I don't know

If yes, please specify.

The European Commission (EC) has a strategy for Europe defined in 3 pillars: Open Innovation, Open Science and Open to the World.

The European Commission has currently a Digital Single Market strategy to support the transition to Open Science. To accomplish some of its goals, the EC has assigned a special Commissioner, Maryia Gabriel for Innovation, Research, Culture, Education and Youth matters.

Moreover, the Commission's Directorate-General for Research and Innovation is responsible for European Union policy on research, science and innovation, with a view to help create growth and jobs and tackle our biggest societal challenges.

26. Are you aware of any international framework(s) for Open Science?
<mark>Yes</mark> No

If yes, please specify.

- Center for Open Science - Open Science Framework: free/open source, supports researchers throughout entire project lifecycle;
- Global Standard-setting Instrument on Open Science (by UNESCO),
- Council of National Open Science Coordination (CONOSC): to create, update and coordinate national OS policies;
- Digital Europe Program (2021-2027);
- Current Research Information Systems (euroCRIS), to promote cooperation within and share knowledge among the research information community and interoperability of research information through CERIF, the Common European Research Information Format.

C) On a global UNESCO Recommendation on Open Science

27. In your opinion, how important is it to reach a global consensus on Open Science?
Not at all It is important <mark>It is important and urgent</mark> I don't know

28. Which key aspects of the transition to Open Science should be considered by a

Global Open Science Recommendation?

A global framework covering all aspects of OS, and capable of identifying globally agreed norms and creating a standard-setting instrument for OS practices assessment, is required. A Global Open Science Recommendation also needs to set the same standards for different disciplines, and for researchers at different career stages.

We highlight the following aspects:

- Researchers need training and support on OS practices and skills (e.g. general knowledge of OS, Research Integrity, OA publishing, research data management, FAIR data, Open Education, Citizen Science, science communication) to create research outputs more readily available and relevant for society. However, it should also be made clear who is responsible for this training (if the individual researchers, if the institutions, if the governments/states).
- Lack of coherent policy on OS occurs at local/institutional, national and international levels. For the open cultural shift to succeed, OS must be encouraged and supported at all levels. A Global Recommendation should emphasize the role of all actors of the Research & Innovation ecosystem in this process. In particular, academic institutions are responsible for making OS training part of the scientific literacy training of graduates & post-graduates. OS skills training should be embedded in courses and these should be tied to actual OS practice (learn by training and learn by doing). At a European level, OS skills training should be embedded in the Innovative Doctoral Training Principles and in the European Framework for Research Careers.
- Besides skills training, comprehensive awareness raising is much needed, as well as encouragement, planning and support for OS within Early Career Researchers and other relevant stakeholders;
- Finally, a Incentive/Reward System should be implemented at different levels - researchers, research groups, institutions, and governments/states - to instigate, promote and reward OS practices, and acquired OS skills and competences, as OS requires time and effort. This is a key step to motivate all the actors in the Research & Innovation ecosystem (individual researchers but also funding agencies, academic institutions, journals, organizations that supply metrics, etc) to play a role in the making of science as a more open, transparent, accessible and inclusive process.

29. What are the obstacles in reaching a global <u>consensus</u> on Open Science?

We can define as a significant obstacle first and utmost the lack of a clear definition of Open Science and related practices. The European Commission defines obstacles around 4 main pillars: people (education and skills training, incentives and rewards, and society involvement); infrastructure (to support OS practices and data science); policies (promoting, regulating and protecting open practices at the institutional, national and international levels); and economic investment (required to develop/implement infrastructures, policies, incentives system and skills

development).

We can further divide these obstacles into socio-cultural (cultural values differences, lack of OS practices awareness, reluctance to change, time and effort-consuming, different discipline approaches and differences in career stages, lack of a reward system for recognition of OS practices), technological (development and improvement of research e-infrastructures - differences in resources between countries/institutions difficult implementation), political (different paces between countries; lack of: integration of OS in governmental agendas with allocation of necessary resources, policy development and strategic planning within institutions), organizational (institutions need to promote an open research culture, making resources available, together with skills training), economic (OS requires significant investments, at least in the initial phases, not all countries/institutions can afford), and legal (lack of international legislation regarding data protection rights and rules for disclosure of data and other research inputs/outputs; privacy, security/safety, commercial interest / conflict of interest and economic benefits).

30. Do you know of any specific platforms to involve different Open Science stakeholders from your country or region in the consultation process for the UNESCO Open Science Recommendation?

The European Commission has a High-Level Advisory Group on OS: The Open Science Policy Platform (OSPP) which consists in a Commission Expert Group to advise on the development/implementation of OS policy in Europe. It involves 20-30 high-level representatives of the broad constituency of European science stakeholders, including universities, research organisations, academies/learned societies, funding organisations, citizen science organisations, publishers, OS platforms/intermediaries, and libraries.

Other OS stakeholders can be found at Science Europe (European association of research performing and research funding organizations), European University Association (EUA), Association of European Research Libraries (LIBER) and Eurodoc (OS ambassadors from different countries and National Associations).

D) OS&international scientific collaboration–call for global response to contain COVID-19 pandemic

The reaction of the scientific community, decision makers, and civil society during this Coronavirus outbreak has revealed the need for rapid scientific and epidemiological data sharing and the importance of international scientific collaborations.

* 31. Are you aware of open science initiatives in the context of the coronavirus research?

eurodoc

The European Council of Doctoral
Candidates and Junior Researchers

info@eurodoc.net
http://www.eurodoc.net
Rue d'Egmont 11, Brussels

Yes, at the international level
Yes, at the national level
<mark>Yes, at both international and national level</mark>
No

* 32. Is your organization involved in research related to coronavirus or sharing relevant information on the virus as it enfolds?

Yes
<mark>No</mark>

33. <mark>If yes,</mark> did you have free access to the scientific information that you needed for your work?

Yes, most of the information that I needed has been open access
Yes, but I encountered cases that the access was restricted

No, I encountered many restricted resources
Please provide more details on you option? If available please include links.

* 34. Do you think that open science approach during the global health crises, such as the one caused by COVID19, should become the norm and not the exception?

Yes
<mark>Yes, but with more clear instructions and regulations</mark>
No, this will not be necessary

* 35. With lessons learnt from the coronavirus pandemic countries should commit (choose from option below) % GDP for scientific research, data and knowledge sharing

1-2 %
<mark>3%</mark>
5%
10%
above 10%
Reason for your choice of option (50 words)

The European Union currently spends ~2% in R&I, with other countries investing ~3%. This is insufficient for current demands (e.g. climate change, COVID-19 pandemics). To be competitive,

EU needs to increase its budget to around €120 billion, but this effort needs to be affordable. The 3% is a good compromise.

* 36. Do you think the COVID-19 pandemics demonstrated the need for reinforced international scientific collaboration?

Yes
No

If yes, *what types of mechanisms would be most urgently needed (100 words)*

The current pandemics highlighted the urgency of collaborative efforts and open access to knowledge. We point as urgent:
- facilitation of access to data/publications, and implementation of Open Access policies in developed and developing countries;
- implementation of infrastructures for deposition of data/publications, particularly datasets and preprints that can be rapidly/openly reviewed by peers;
- training of scientists on OS practices, in particular FAIR data standards to fully take advantage of data sharing;
- development/accessibility to tools/infrastructures that can facilitate online networks and large-scale collaborations;
- provide support to developing countries/low-income institutions, to truly make knowledge openly accessible and (re)used.