UNESCO Recommendation on Open Science
Response to the first draft by the Open Science Global Working Group
of the global network of Young Academies

Earlier this month (December 2020), members of the Open Science Global Working Group of the global network of Young Academies, comprising the Global Young Academy (GYA) and 25 National Young Academies (NYAs) met to discuss the first draft of the UNESCO's Draft Recommendation on Open Science. Participants joined from eleven countries and with broad and diverse interests in open science; the most common interests were in open publishing, open data, open educational resources, support for open science, and open science and the public.

Our members appreciated the opportunity to provide input to UNESCO's statement in June and the opportunity to provide a response to this statement. We felt that the draft statement addressed many of the key opportunities and challenges of open science, but that there were several points that should be acknowledged and/or strengthened prior to the statement being finalised. Below, this feedback is organized based on the relevant sections of the draft statement.

Preamble

It might be worth considering acknowledging the role of Open science in achieving the UN Sustainable Development Goals as well as in monitoring progress. We suggest adding:

> *"Acknowledging the role of Open Science as a valuable means for both achieving the UN Sustainable Development Goals and for monitoring progress,..."*

II. DEFINITION OF OPEN SCIENCE

Point 9, (i) [Open Access]

We note that Open Access is useless unless scientific outputs are provided in forms that make them usable. This requires scholarly communication to consider audiences, regarding both natural language and technical background. In fact, the vast majority of publications in "Open Access journals" fail these criteria when it comes to the tax-paying public (which is frequently referred to in arguing for Open Access). While this could be mentioned under point 9, it also becomes relevant for areas of action discussed elsewhere in the document. In particular, language creates a barrier on equal opportunities and access, **point 16 (b)**, and it is striking that language does not feature in this context in the draft text, while we think that it provides us with a major challenge that must not be ignored. We also suggest amending **point 22 (b)** as follows:

> *"In fact, the principles of Open Science require to orientate scholarly communication towards serving the needs of various audiences, both with regard to natural language and technical background."*

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Moreover, we notice that **point 19 (e)** mentions "promoting multilingualism", but we would suggest amending this with further support action as follows:

> "*Support should be available for citizens who want to access and engage in their first language.*"

Point 9, (iv) [Open Science Infrastructures]

The draft states that Open Science Infrastructures should "guarantee permanent and unrestricted access to all public". However, it is important to note that both read- and write-access is required, in accordance with Art 27(1) of the UN Declaration of Human Rights, which recognises the right to "share in scientific advancement", echoed by the principle of inclusiveness, as described in **point 15 (v)**. Flipping the paywall is not a solution. We believe that Member States should be expected to guarantee this right and assume responsibility for providing free (read- and write-) access to suitable infrastructures. We suggest amending **point 20** accordingly (see below).

Point 9 – missing aspect [Open Laboratories]

We think that **Open Laboratories should be mentioned.** Under **point 9 (iv)**, Open Science Infrastructures refers to digital infrastructures only. However, there have also been movements to share physical laboratory facilities. While there is long-established practice for access of researchers to facilities such as astronomical observatories or particle accelerators, we see increasing desire to share access to chemical and biomedical laboratories. This provides a particular opportunity for constructive involvement of the private sector in Open Science.

III. OPEN SCIENCE CORE VALUES AND GUIDING PRINCIPLES

Point 15, (ii) [Equity and Fairness]

We underline the importance of this point but think that the phrasing should be reworked. First, equity is not a binary issue between "developed" and "developing" countries, and such a picture of two confronting worlds is inadequate. Second, "reciprocal" sharing is of more benefit to the partner with larger resources to exploit results and data. Third, Open Science is not based on bilateral reciprocity, but on multilateral principles.

Point 16 (e) [Flexibility]

We most strongly agree that flexibility is key and that a one-size-fits-all approach to open science would not be successful. We feel that this should be highlighted throughout the statement. Our proposed amendment on **point 22** with regard to the purpose-orientation of research assessment (see below) constitutes such an important clarification. However, a very

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heterogeneous landscape poses many challenges for achieving an equitable global system. We also propose amending **point 24** to acknowledge adaptation to specific needs.

IV. AREAS OF ACTION

(iii) Investing in Open Science Infrastructures and services (point 20)

Recognising the need for both read- and write-access for participating in Open Science as a global venture, we suggest amending **point 20** as follows (insert before "Member states are encouraged"):

> *"Researchers should have an unlimited right of write- and read-access to platforms of scholarly communication that support critical debate in a transparent fashion and enable engagement in a global conversation."*

This also states requirements on what the infrastructures need to support and stresses indiscriminate access regardless of location, **point 16 (b).** The global aspect could be reiterated in the context of **point 24**. This also relates to **point 19 (e)**, which appears somewhat misplaced in the context of "Transforming scientific culture and aligning incentives for Open Science" and may better relate to **point 20**.

In fact, financing of the required infrastructure constitutes a major challenge and participants shared concerns that there would not be funding to develop open science infrastructure in low- to medium-income countries and measures need to be taken to prevent disadvantaging scientists in those countries. We appreciate that **point 24 (b)** calls for establishing regional and international funding mechanisms.

Internet bandwidth remains an issue in many countries and especially in rural areas. Recognising that with ongoing technology development, inequalities will remain, and adopted standards should mitigate against computing facilities and digital public infrastructure not being encompassing enough. We suggest amending **point 20 (f)** as follows (insert before "International Scientific Unions…"):

> *"Open Science Infrastructures should be built exclusively on open standards, which support commonly-available technology rather than restricting meaningful global access by being too demanding on resources."*

(iv) Investing in capacity building for Open Science (point 21)

We echo the fact that training and education needs to be a top priority, noting that while many open-science activities have been driven by scientific communities, other scientists learn about

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open science practices on an ad-hoc basis. We are disappointed to see that the draft statement mentions that 1% of GDP should be invested in R&D, **point 20 (a)**, while there is no corresponding target on education mentioned, **point 21 (b),** and we recommend this being considered.

We note that **point 21** focuses on tertiary education, whereas it requires a broader approach across all education sectors as well as continuing professional development. Wide scientific literacy and knowledge about the processes in the pursuit of science are important for building and maintaining trust. We suggest adding the following as first sub-point to **point 21:**

> *"The principles of Open Science need to be incorporated in education and training programmes, covering all education sectors as well as support for continuing professional development for academia, businesses, government, non-for-profit organisations, and individuals. As societal benefits depend on the width of participation, a wide general scientific literacy should be fostered, which moreover is essential for building and maintaining trust. Building capacity on Open Science skills should be an integral part of national strategies for implementing the UN Strategic Development Goals."*

(v) Transforming scientific culture and aligning incentives for Open Science (point 22)

We much appreciate that this point explicitly talks about removing barriers as well as about the risk of exploitation of data by those with the strongest resources to the detriment of others including the creators. However, we think there needs to be a statement on the fundamental cultural requirements for Open Science, without which it would lose its basis. We therefore suggest **inserting the following to point 22 as first sub-point**:

> *"Open Science requires cultivating respectful open debate involving scrutiny and critique, as well as transparency, overcoming barriers arising from established hierarchies".*

We are also missing a statement on key principles of research assessment—it needs to be purpose-oriented and needs to consider context and interaction. We suggest **inserting the following to point 22 before sub-point (b)** in the list of items to consider:

> *"Research assessment must never become disconnected from a specific purpose. Given that there are many such specific purposes, there is no meaningful universal ranking, be it at global, national, or even institutional level. Our success as society hinges on diversity, and rather than looking at individuals in isolation, we need to consider interactions and specific context of roles within a complex system."*

We are concerned that **point 22** could be misunderstood as a call for Member States to implement national assessment systems that turn out to be as damaging as international university rankings

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and therefore would like to see this clarified by the proposed insertion. As pointed out in **point 12**, it is leaders at research institutions who are "key to developing a supportive structure and reward system for Open Science practices", not Member States. We think that more than just a reward system, researchers require support to be responsible actors who take initiatives (rather than being driven by incentives), and this should be stated explicitly in this context, following up from **point 12.** We suggest amending **point 22 (a)** as follows:

> *".... to change the current research culture, providing support to foster responsible and ethical researchers and managers, appreciating initiative, and to reward…"*

Moreover, we would like to see the principle of due credit being strengthened and therefore suggest **amending point 22 (b)** as follows:

> *"Researchers must be able to claim due credit for their work, and their contributions of various kind to scholarship and society need to be identifiable and verifiable."*

(vii) Transforming scientific culture and aligning incentives for Open Science (point 24)

Following up on the flexibility of the global Open Science system, point 16 (e), it would be worth stressing that it should respect specific local needs and circumstances. We therefore propose amending point 24 with the following sub-point:

"Recognising that a global Open Science system does not call for uniformity but should locally adapt to specific needs and circumstances and in particular be considered a valuable means for advancing towards the UN Sustainable Development Goals."

V. MONITORING

We understand that details about the monitoring process are still under discussion, and we think that more guidance could be provided, in particular on at what level monitoring should occur. We agree that collecting examples of good practice would constitute a most valuable resource and moreover think that clear infographics might convey the message better than lengthy documents.