

## Response from the Royal Society of Biology (RSB) to the consultation on the Future Research Assessment Programme

6 May 2022

*The Royal Society of Biology (RSB) is a single unified voice, representing a diverse membership of individuals, learned societies and other organisations. Our world-leading biosciences sector contributes strongly to the economy, and to society. We are committed to ensuring that we provide Government and other policymakers, including funders of biological education and research, with a distinct point of access to authoritative, independent, and evidence-based opinion, representative of the widest range of bioscience disciplines.*

*The RSB welcomes the UK higher education funding bodies' consultation on the future research assessment programme. We are pleased to provide comments informed by our membership of individuals and organisations with expert interests across the biosciences.*

*Our Member Organisations are listed in Appendix 1.*

### Section one: purposes of research assessment

1. In addition to enabling the allocation of research funding and providing accountability for public investment in research, which purposes should a future UK research assessment exercise fulfil? Select all that apply.
  - a. **Provide benchmarking information**
  - b. **Provide an evidence base to inform strategic national priorities**
  - c. **Provide an evidence base for HEIs and other bodies to inform decisions on resource allocation**
  - d. Create a performance incentive for HEIs.

For this question we selected options (a), (b) and (c), but please see our further considerations and discussion in answer to question 4.

2. What, if any, additional purposes should be fulfilled by a future exercise?

The Royal Society of Biology (RSB) supports a dual system that balances responsive funding and quality-related (QR) funding based on research quality assessment<sup>1</sup>.

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<sup>1</sup> The Royal Society of Biology, (2020). Response from the Royal Society of Biology to the House of Commons Science and Technology Select Committee's inquiry into A New UK Research Funding Agency. URL: [https://www.rsb.org.uk/images/A\\_New\\_UK\\_Funding\\_Agency\\_-\\_RSB\\_response\\_-\\_submitted.pdf](https://www.rsb.org.uk/images/A_New_UK_Funding_Agency_-_RSB_response_-_submitted.pdf)

QR-funding, which is allocated based on the quality and volume of research, and costs of working in a particular subject area, can be used by higher education institutions (HEIs) to fund: research, knowledge exchange and related activities, according to their own strategic priorities<sup>2</sup>. QR-funding is separate but complements other sources of income, such as responsive-mode and other competitive grants from research councils, private and charity funders.

It has long been the case that there remains a shortfall of funding for research, particularly in scientific disciplines, from these different sources (as evidenced by TRAC funding data at institutional level<sup>3</sup>). Therefore, the balance of competitive and QR-funding needs addressing. Equally, transparency about the purpose of REF and QR-funding allocation, which varies across the devolved administrations, should also be addressed.

QR-funding is currently required by institutions to enable them to fulfil the obligations of competitively awarded grants, few of which cover the full economic cost of delivery on their own. QR-funding is also a source of matched funding, can contribute to the salary of academic staff for their research time, and be used to initiate new projects that will lead to grant funding or to tide over funding for those between grants. The changing and growing financial pressure on institutions will only heighten the problem of QR insufficiency to supplement other income sources, because options for other cross-subsidy are reducing, exposing the fragility of the HEI funding system to shocks.

High costs of research incurred by scientific disciplines is often offset by HEIs using privately funded money (e.g. fees for international students or students in unrelated disciplines) - without that cross-subsidy current levels of research activity would be unattainable. This situation raises concerns, particularly around the justification and sustainability of this financing model.

QR-funding is a vital source of support for academic research in the UK. However, we recommend that regular reviews of the research assessment and its practical implementations must assess successes and shortcomings critically and empirically, in order to drive up the quality of research undertaken in the UK.

The combination of these separate but complimentary funding streams should achieve an appropriate balance of applied, translational and discovery research that does not focus exclusively on immediate-term impact. We believe that: “the interdependence of discovery and applied research is such that they complement each other and this is just one of the reasons to safeguard a healthy balance of funding for both. In addition, knowledge has intrinsic value and fundamental research often leads to unpredicted breakthroughs and enhanced capability for people to thrive”<sup>4</sup>.

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<sup>2</sup> UKRI: Funding we allocate. URL: <https://www.ukri.org/councils/research-england/how-research-england-funding-works/funding-we-allocate/what-formula-based-funding-can-be-used-for/>

<sup>3</sup> Transparent Approach to Costing (TRAC). URL: <https://www.trac.ac.uk/about/>

<sup>4</sup> The Royal Society of Biology, (2018). Response from the Royal Society of Biology to the House of Commons Science and Technology Select Committee's inquiry on Balance and effectiveness of research and innovation spending. URL: [https://www.rsb.org.uk/images/article/policy/RSB\\_response\\_to\\_HoC\\_STC\\_inquiry\\_on\\_research\\_and\\_innovation\\_spending\\_submitted.pdf](https://www.rsb.org.uk/images/article/policy/RSB_response_to_HoC_STC_inquiry_on_research_and_innovation_spending_submitted.pdf)

The RSB supports a culture of evaluation, gathering evidence nationwide for benchmarking. It should aim for positive transformative effects for the institutions assessed, and avoid the risk of misplaced performance incentives for individual researchers. We will return to the distinction between institutional-level and researcher-level impact of performance incentives in answer to question 4.

The recent real-time evaluation of the REF 2021 demonstrated that within medicine, health and life sciences (Main Panel A) respondents were more likely to endorse accountability as a purpose<sup>5</sup>.

The RSB previously welcomed “UKRI’s commitment to take into account the existing body of evidence, such as the Science and Innovation Audits and the Research Excellence Framework, as well as the advice of stakeholders across the research communities to inform decisions on research funding allocations. This will ensure that emerging and strategically important fields of research are rapidly identified and appropriately supported in a timely manner”.

The research assessment process can – at least partially – provide a snapshot of current research in the UK, which can in turn suggest gaps and identify opportunities, and therefore guide the public funders towards decisions that strengthen the national research and innovation landscape.

3. Could any of the purposes be fulfilled via an alternative route? If yes, please provide further explanation.
4. Do you have any further comments to make regarding the purposes of a future research assessment system?

We selected 3 out of 4 purposes (a,b,c) in question one and we could have included the fourth one about ‘performance incentives for HEIs’ under certain conditions – that was however the most controversial of the options. All four purposes could be integral and critical to enhance UK research quality but what appears most essential is the ability of the funders to explain to the academic community in clearer terms and details what they are trying to achieve with future exercises. The RAND study corroborated this need by stating that: “academics generally reported a lack of clarity around the purpose of the REF. Although the purposes may hold different weights, going forward, it is important to be explicit about the purpose of the exercise to ensure the sector are clear on its value and can put the burden into context”<sup>6</sup>.

The way REF has been interpreted and administered locally at universities over the years is far from optimal and the funders share a responsibility for this. This resonates with our earlier submission to the 2016 Stern review: “information gathered through the REF is an important factor in strategic planning in the University sector, it influences management decisions but it is

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<sup>5</sup> Manville, C., et al. (2021), *Understanding perceptions of the Research Excellence Framework among UK researchers: The Real-Time REF Review*. RAND Corporation, Santa Monica, California. As of March 29, 2022: [https://www.rand.org/pubs/research\\_reports/RRA1278-1.html](https://www.rand.org/pubs/research_reports/RRA1278-1.html)

<sup>6</sup> Manville, C., et al. (2021), *Understanding perceptions of the Research Excellence Framework among UK researchers: The Real-Time REF Review*. RAND Corporation, Santa Monica, California. As of March 29, 2022: [https://www.rand.org/pubs/research\\_reports/RRA1278-1.html](https://www.rand.org/pubs/research_reports/RRA1278-1.html)

by no means the only influence. Performance in the REF does not automatically translate into positive or negative outcomes for individual departments or research groups, but it plays an increasingly important role in how such units are structured and configured. However, a risk exists of REF information taking priority over other management information, leading to institutional decisions that are based on what is inevitably a partial picture”<sup>7</sup>.

Funders and HEIs should do more in the future to bridge the gap between the intentions and the reality of REF. We clearly heard concerns that there is still significant ‘game playing’ driving submissions, even though we acknowledge that the recent REF has managed to better align its working methods to the general purpose/aspirations of the exercise.

A new design for the exercise should seek to resolve the disconnect that exists between good outcomes for researchers and the environment they operate in, and the need of HEI managers to balance the books using the allocated QR-funding. Consultation with HEIs staff in different roles could help identify ways to foster diversity and creativity, and create the right conditions for good research.

We will use this answer to provide additional **comments and caveats** to our choice of purposes in question 1.

An important caveat that underlines purposes b. and c. is that previous REFs could not provide exhaustive and comprehensive surveys of the national research efforts over time but at most, a biased partial inventory preselected by the submitting institutions according to their internal processes that aimed to maximize the chances of scoring high in the exercise. The design of the exercise and the guidance provided to HEIs constrain and influence their choices and behaviors. Acting on them can ameliorate some of the undesired biases. However, until submissions are fully inclusive (i.e. pooling from the entirety of outputs generated by academics) we cannot treat the REF evidence base as truly representative and unbiased. This will always be a limitation.

A specific caveat of using the outcome of REF to ‘inform decisions on resource allocation’ depends on whether HEIs will be free to decide how to invest resources locally and what kind of investment they will make. REF can be used to determine resource allocation to HEIs, but it should be for the university itself to decide on the strategic allocation of those resources. Similarly, individual departments should have the freedom to allocate their funding in line with their strategy. Explicit recommendations from the funders on the other hand may drive unwanted uniformity in the HEI sector and discourage institutions from serving the unique needs of their local communities and student populations.

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<sup>7</sup> The Royal Society of Biology, (2016). Response from the Royal Society of Biology to the independent review of the Research Excellence Framework chaired by Lord Stern. URL: [https://www.rsb.org.uk/images/pdf/FINAL\\_RSB\\_response\\_to\\_Stern\\_Review.pdf](https://www.rsb.org.uk/images/pdf/FINAL_RSB_response_to_Stern_Review.pdf)

Funding may be directed to given subject areas, either specifically (subject by subject) or more generally (by area, such as faculty), and importantly, to support the right environment at the institutions so that researchers' wellbeing and creativity can thrive.

QR-funding can **support essential areas of research** that may not attract other competitive grants and keep the lights on **niche field** where skills and expertise have dwindled over time. The Nurse review of the UK research councils<sup>8</sup> stressed the importance of ensuring agility and maintaining capability of the R&D system through the councils' coordinated action and data management systems (now via UKRI). Maintenance of research capability at a national level is required to correct for skills shortages and for deficits in capacity. The review also specified that:

- the key requirements for an agile and capable research endeavour are the availability of improved data management systems describing the nation's research activities and their geographical distribution;
- having horizon scanning processes in place to be aware of future needs and possibilities;
- and the maintenance of breadth in research activity to ensure basic capacity across the scientific disciplines.

In addition to these, both the Nurse review and our previous recommendations<sup>9</sup> flagged the importance of **identifying and filling gaps in research provision and skills** in the most effective and efficient way.

A 2014 report by the UK Plant Sciences Federation [now the RSB Plant Science Group] examined skills shortages within plant sciences – a strategically important capability for the UK – identifying demand for skills in plant physiology, plant pathology, field studies, horticultural science, crop science, taxonomy and identification<sup>10</sup>.

As part of the evidence gathering for this consultation, a number of scientific societies brought to us their long-standing concern about the depleted state of expertise in whole organism biology and systematics in the UK. By expertise, they mean professionals in permanent posts who specialise in some aspect of the biology (including systematics) of a plant/fungal group and who have a good general understanding of the overall biology of that group<sup>11</sup>.

These organisations recognise that over time academic institutions adopted management practices that penalised their field and led to the disappearance of research posts at universities across the UK. This is in part due to the original narrow focus of REF on income of research grants and output of published papers as principal performance indicators<sup>12</sup>. Back in 1999, they

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<sup>8</sup> Department for Business, Innovation & Skills, (2015). Ensuring a successful research endeavour: review of the UK research councils by Paul Nurse. <https://www.gov.uk/government/publications/nurse-review-of-research-councils-recommendations>

<sup>9</sup> The Royal Society of Biology, (2018). Response from the Royal Society of Biology to the House of Lords Science and Technology Committee inquiry into Life Sciences and the Industrial Strategy. URL: [https://www.rsb.org.uk/images/RSB\\_response\\_Life\\_Sciences\\_Industrial\\_Strategy\\_inquiry\\_submitted.pdf](https://www.rsb.org.uk/images/RSB_response_Life_Sciences_Industrial_Strategy_inquiry_submitted.pdf)

<sup>10</sup> UK Plant Science: Current status & future challenges. [https://www.rsb.org.uk/images/pdf/UK\\_Plant\\_Science-Current\\_status\\_and\\_future\\_challenges.pdf](https://www.rsb.org.uk/images/pdf/UK_Plant_Science-Current_status_and_future_challenges.pdf)

<sup>11</sup> The Botanical Society of the British Isles, The Botanical Society of Scotland, The British Bryological Society, The British Lichen Society, The British Mycological Society, The British Phycological Society, The British Pteridological Society, (2000). Letter to Professor David King, chief scientific adviser, on the the state of whole organism biology and systematics in the UK. Available on request

<sup>12</sup> Crittenden, P.D. (1999). Presidential address to the British Lichen Society. Available on request



stated that: “when new staff are recruited, a major consideration (and sometimes the only consideration) in making appointments is the potential productivity of the candidates in terms of the “money in - papers out” yardsticks. Molecular biology, genetic manipulation and ecotoxicology are some of the subjects that currently attract major funding - these are areas in which new appointments are frequently made. Complementation of teaching and contributing to the diversity of expertise within a department are not usually major considerations”. Predictions about the disappearance of taxonomic experts with skills in species identification made two decades ago now appear like a harsh reality (an informal survey of research posts involving a set of major taxonomic classes reveal at least a 50% reduction from 2013 to 2022). Other research funding streams (e.g. responsive mode grants) did not manage to reverse this trend. Such disappearing expertise, which encompasses multiple species, from cyanobacteria to fungi, plants and animals, is a vital resource for advancing research and conservation: it is important to meet the needs of science and industry, including the UK’s obligations to national and international biodiversity and conservation initiatives.

While safeguarding the independence of HEIs’ decisions about the internal allocation of QR-funding, the research quality assessment should better steer and promote management choices in which it is not the individual researcher’s potential to win competitive grants that matters but the **promotion of a virtuous, diverse and resilient academic environment** instead.

The assessment of research excellence should not focus uniquely on ground-breaking, cutting-edge outputs but also support the vital breadth of research that make the UK bioscience sector rich, diverse, robust and resilient to change. We fear that in the current research assessment climate and as a result of existing drivers for HEI funding allocation, institutions are discouraged to locally invest in essential but niche disciplines (e.g. whole organism biology and taxonomy), by expanding the number of academic posts available in these important and depleted areas of research. Many considerations usually surround staff appointments (e.g. financial viability of offering particular courses, relative track records of the candidates who apply) but recognition and rewards are important elements of incentivizing research areas and the development of research staff.

The use of REF to create **performance incentives for HEIs** is the most controversial aspect and will require careful development, consultation and presentation to the HEI sector to act as a positive driver for research excellence. The main concern is that performance incentives that are meant to reward and drive positive systemic change at an institution level may lead to unfavourable outcomes at the level of individual staff. Previous changes to the design of REF (e.g. increased weighting of impact case studies) ended up being used as criteria for individual researchers promotion/recruitment instead of driving institutions to invest in an environment that enables all researchers to develop and communicate the impact of their work (via collaborations, knowledge exchange offices, training etc.). A distinction between performance incentives at the institutional versus individual research level could alleviate the concerns, particularly if the

incentives are co-developed in consultation with HEIs staff and appropriately communicated to the sector in due course.

The incorrect use of performance incentives risks pushing universities towards short-termism and quick wins over the longer-term discovery research. If incentives are used to encourage transparency and enhance inclusivity, they should recognise, value and reward the range of perspectives and diversity existing in the current academic system, acknowledging different contributions. The right use of incentives could also counteract some of the regional inequalities seen in the higher education sector by focusing more on valuable aspects of the research environment, such as diversity and inclusion, collaborations, open research and integrity.

As a drawback, care should be taken that incentives do not replicate existing inequalities in the current research system (which has been acknowledged to be biased on occasion). Therefore, equitable approaches should be used and the criteria should be reviewed to avoid inadvertent discrimination.

As discussed more in depth below, **standardised measures of research integrity** are still being piloted across the sector; therefore, disparities in how they are implemented across the higher education sector would have to be acknowledged.

## Section two: setting priorities

5. To what extent should the funding bodies be guided by the following considerations in developing the next assessment system? Please rank the considerations from 1 (most important) to 9 (least important)
- a. Ability of the system to promote research with wider socio-economic impact.
  - b. Comparability of assessment outcomes (across institutions, disciplines and/or assessment exercises)
  - c. Ensuring that the bureaucratic burden of the system is proportionate
  - d. Impact of the assessment system on local/regional development
  - e. Impact of the system on research culture
  - f. Impact of the system on the UK research system's international standing
  - g. Maintaining continuity with REF 2021
  - h. Providing early confirmation of the assessment framework and guidance
  - i. Robustness of assessment outcomes

We could not rank these options unambiguously because we did not get consensus in the exact choices/ranking in our sample of members. However we can highlight more versus less important areas & areas where there appears to be a general agreement. For an extended discussion see answer to question 7.

General agreement on:

- (c) Ensuring that the bureaucratic burden of the system is proportionate;
- (e) Impact of the system on research culture

Most agree on:

(b) Comparability of assessment outcomes (across institutions, disciplines and/or assessment exercises)

While:

(i) Robustness of assessment outcomes – is considered a given! Important but not the main consideration.

We have comments on (g) and (h), in answer to question 7 – these are a matter of tradeoff.

6. Relating to research culture, to what extent should the funding bodies be guided by the following considerations in developing the next assessment system? Please rank the considerations from 1 (most important) to 6 (least important)
- a. Impact of the assessment system on research careers
  - b. Impact of the assessment system on equality, diversity and inclusion
  - c. Ability of the assessment system to promote collaboration (across institutions, sectors and/or nations)
  - d. Impact of the system on inter- and transdisciplinary research
  - e. Impact of the system on open research
  - f. Impact of the system on research integrity

We could not rank these options unambiguously because we did not get consensus in the exact choices/ranking in our sample of members. However we can highlight more versus less important areas & areas where there appears to be a general agreement. For an extended discussion see answer to question 8.

All areas are considered generally important.

Scoring highest: (b) Impact of the assessment system on equality, diversity and inclusion; (a) Impact of the assessment system on research careers.

The option (c) ability of the assessment system to promote collaboration (across institutions, sectors and/or nations), is also generally considered important, particularly providing support for researchers working on the boundaries between disciplines (option d). Collaborations is also important in line with government's ambition for a Global Britain. The main aspect to improve is the distinction between contribution versus attribution and making sure that assessment criteria match that distinction, therefore discouraging improper ways to 'game' the system over true collaborations.

7. What, if any, further considerations should influence the development of a future assessment system? Please set out the considerations and indicate where they should be located in the list of priorities.

We support a more holistic assessment, in which a broader definition of excellence should include and support open research practices, research integrity, research careers (especially early career researchers and those in research-related roles), and team science.



Research assessment should contribute to ensuring that the UK maintains and enhances its position as a global science superpower, while supporting and advancing all disciplines in an increasingly multidisciplinary research sector. Equally, REF bureaucracy and time commitment should be reduced. Some of our members still have questions about the opportunity costs of REF given that: “the REF Accountability review estimated that the total cost to the UK of running REF 2014 was £246m. The report found that the cost of submitting to the REF was 133% more than that of the 2008 RAE”.

One aspect that may require consideration and explanation to the sector is how the funders will determine the relative weight of different purposes in the assessment of HEIs’ submissions (e.g. how will excellent research culture count versus the socioeconomic impacts of research?).

It is fundamental that a shift takes place in the way that the research assessment process affects institutions versus individuals. Funders should communicate to academics the value of QR-funding to improve the environment for research.

## 8. How can a future UK research assessment system best support a positive research culture?

Through the research assessment process and QR-related funding allocation, the funding bodies have a role to play in setting the right norms and correct incentives that will drive improvement in **research culture and integrity**. This is reflected in the funders’ commitment to the national concordat for research integrity<sup>13</sup>.

All considerations listed under question six are important in our view and the Society has considered them in a number of our outputs and recommendations<sup>14, 15, 16, 17, 18, 19, 20, 21, 22</sup>. We would like to set out principles for the research assessment system that might support a positive research culture and then discuss potential measures and mechanisms in section three below, which looks at criteria for the evaluation of research excellence.

<sup>13</sup> Revised concordat to support research integrity, 2019: <https://www.universitiesuk.ac.uk/sites/default/files/field/downloads/2021-08/Updated%20FINAL-the-concordat-to-support-research-integrity.pdf>

<sup>14</sup> The Royal Society of Biology, (2021). Response from the Royal Society of Biology to the consultation on the draft UKRI Equality, Diversity and Inclusion Strategy. URL: [https://www.rsb.org.uk/images/Policy/Royal\\_Society\\_of\\_Biology\\_letter\\_draft\\_UKRI\\_EDI\\_strategy.pdf](https://www.rsb.org.uk/images/Policy/Royal_Society_of_Biology_letter_draft_UKRI_EDI_strategy.pdf)

<sup>15</sup> UK reproducibility Network Stakeholder Engagement Group, (2021). Written Evidence Submitted to the House of Commons Science and Technology Committee inquiry on Reproducibility and Research Integrity. [online] Available at: <https://committees.parliament.uk/writtenevidence/39680/pdf/> [Accessed 19 April 2022].

<sup>16</sup> The Royal Society of Biology, (2020). Response from the Royal Society of Biology to the UK Research and Innovation (UKRI) Open Access Review consultation. URL: [https://www.rsb.org.uk/images/Policy/RSB\\_response\\_to\\_UKRI\\_Open\\_Access\\_Review.pdf](https://www.rsb.org.uk/images/Policy/RSB_response_to_UKRI_Open_Access_Review.pdf)

<sup>17</sup> Heads of University Biosciences (HUBS) & Heads of University Centres of Biomedical Sciences (HUCBMS), (2019). Letter to the REF director about the treatment of pedagogical research in the biological sciences.

<sup>18</sup> The Royal Society of Biology, (2018). Response from the Royal Society of Biology to the House of Commons Science and Technology Select Committee’s inquiry on Balance and effectiveness of research and innovation spending. URL: [https://www.rsb.org.uk/images/article/policy/RSB\\_response\\_to\\_HoC\\_STC\\_inquiry\\_on\\_research\\_and\\_innovation\\_spending\\_submitted.pdf](https://www.rsb.org.uk/images/article/policy/RSB_response_to_HoC_STC_inquiry_on_research_and_innovation_spending_submitted.pdf)

<sup>19</sup> The Royal Society of Biology, (2020). Response from the Royal Society of Biology to the BEIS R&D survey consultation on the UK R&D Roadmap 2020. URL: [https://www.rsb.org.uk/images/RSB\\_response\\_to\\_the\\_BEIS\\_survey\\_UK\\_RD\\_Roadmap\\_2020\\_submitted.pdf](https://www.rsb.org.uk/images/RSB_response_to_the_BEIS_survey_UK_RD_Roadmap_2020_submitted.pdf)

<sup>20</sup> The Royal Society of Biology, (2016). Response from the Royal Society of Biology to the independent review of the Research Excellence Framework chaired by Lord Stern. URL: [https://www.rsb.org.uk/images/pdf/FINAL\\_RSB\\_response\\_to\\_Stern\\_Review.pdf](https://www.rsb.org.uk/images/pdf/FINAL_RSB_response_to_Stern_Review.pdf)

<sup>21</sup> The Royal Society of Biology, (2017). Response from the Royal Society of Biology to the HEFCE consultation on the 2nd Research Excellence Framework. URL: [https://www.rsb.org.uk/images/RSB\\_response\\_to\\_the\\_HEFCE\\_consultation\\_on\\_the\\_2nd\\_REF\\_Final\\_response.pdf](https://www.rsb.org.uk/images/RSB_response_to_the_HEFCE_consultation_on_the_2nd_REF_Final_response.pdf)

<sup>22</sup> The Royal Society of Biology, (2018). Response from the Royal Society of Biology to the UK Higher Education Funding Bodies consultation on REF 2021 draft guidance on submissions, panel criteria and working methods. URL: [https://www.rsb.org.uk/images/Policy/RSB\\_Response\\_to\\_REF2021\\_consultation\\_on\\_draft\\_Guidance\\_to\\_Submissions\\_Panel\\_Criteria\\_and\\_working\\_methods.pdf](https://www.rsb.org.uk/images/Policy/RSB_Response_to_REF2021_consultation_on_draft_Guidance_to_Submissions_Panel_Criteria_and_working_methods.pdf)

The achievement of **equality and diversity** in the higher education sector remains fundamentally important, for example, at the time of the Stern review in 2016, we welcomed the funders' decision requiring REF to engage with the Athena SWAN programme. Since then, the conversation has developed further and future REFs should include any lessons learned in the meantime, including from the recent inquiry into equity in the STEM workforce<sup>23</sup>. The Equality, Diversity and Inclusion in Science and Health (EDIS) coalition highlights up-to-date resources to support the advancement of equality, diversity and inclusion in the biomedical research field.

In order to improve and support diversity, equality and inclusion in the REF process and the assessment of interdisciplinary research, the Equality and Diversity Advisory Panel (EDAP) and the Interdisciplinary Research Advisory Panel (IDAP) have been established. Furthermore, each sub-panel has appointed members with a specific role to oversee and participate in the assessment of interdisciplinary research submitted in that unit of assessment, to ensure its equitable assessment. The lessons learned and examples of positive impacts obtained by the establishment of these panels and roles should guide the funders to develop a similar programme to ensure other aspects of research culture and integrity are also taken into consideration and properly evaluated.

Another aspect that is worth considering is the vital role for **knowledge transfer** to ensure knowledge is shared and makes as much difference as possible. This may be included under options (e) and (f) in question 6, but could be specified more clearly.

We would like to suggest that those tasked with developing the future UK research assessment system should, as part of review, further investigate the **drivers and stressors researchers face** which may impact on researchers' wellbeing, creativity, choices, progression and productivity, thus underpinning research culture<sup>24</sup>. Such stressors could include a pressure to publish, lack of training opportunities or access, or inadequate recognition systems in team science contributions<sup>25</sup>. Published studies on research culture, including about researcher communities, research systems and dynamics (e.g. characteristics of a productive research environment<sup>26</sup> or environmental factors supporting scientific and technological creativity<sup>27</sup> and tools for assessing them<sup>28</sup>) and the inclusion of current practice and pilots of change among others, could be reviewed and their implications considered.

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<sup>23</sup> <https://www.britishecienceassociation.org/equity-in-stem-workforce>

<sup>24</sup> Royal Society of Biology, 2017. A response to Science and Technology Select Committee inquiry on Research Integrity: <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee/research-integrity/written/48791.pdf>

<sup>25</sup> Woolard, J. The role of 'Team Science' in promoting a supportive research culture. Available at: <https://realisingourpotential.russellgroup.ac.uk/the-role-of-team-science-in-promoting-a-supportive-research-culture/index.html>

<sup>26</sup> Bland, C. J.; Ruffin, M. T. (1992) Characteristics of a productive research environment: literature review, *Academic Medicine : Journal of the Association of American Medical Colleges*, vol. 67, no. 6, pp. 385-397, available online at: <https://doi.org/10.1097/00001888-199206000-00010>

<sup>27</sup> Hemlin, Sven; Allwood, Carl Martin; Martin, Ben R. (2008) Creative Knowledge Environments, *Creativity Research Journal*, vol. 20, no. 2, pp. 196-210, available online at: <https://doi.org/10.1080/10400410802060018>

<sup>28</sup> Mathisen, Gro Ellen; Einarsen, Stale (2010) A Review of Instruments Assessing Creative and Innovative Environments Within Organizations, *Creativity Research Journal*, vol. 16, no. 1, pp. 119-140, available online at: [https://doi.org/10.1207/s15326934crj1601\\_12](https://doi.org/10.1207/s15326934crj1601_12)

The future research assessment should also take into account current **policies and practice across the funding landscape**, for example UKRI research integrity policies<sup>29</sup>, data sharing policies and the funding assurance programme<sup>30</sup>. In certain areas of research integrity, little progress has been made and arguably too slowly, so potentially there could be a role for future research assessments to promote the desired change more decisively. However, the mechanisms designed to achieve these goals will be crucially important. In fact, we must warn against the scenario that new compliance requirements will increase administrative burden excessively.

The **COVID-19 pandemic** has exacerbated ongoing systemic pressures affecting researchers and research activity<sup>31</sup>. The multifaceted impacts of the pandemic, including complex and varied effects on researchers' personal circumstances, have disproportionately affected subsets of researchers (e.g. those with caring responsibilities or at insecure stages of their careers) and their ability to produce research outcomes. These disruptions are likely to have long-term impacts for example on researchers' ability to publish their research, to apply for research grants, and to develop the evidence base for future grant applications. In future assessment processes, the equality and diversity advisory panel should consider these impacts when developing guidance and criteria that appropriately recognise equality and diversity considerations in all elements of submissions.

**Open research practices and reproducibility** should be a central feature in the future research framework, which must support and reward institutions that make results/outputs accessible and transparent, including beyond the research community, where required, necessary or beneficial (with due consideration given to security and counteracting misinformation/misinterpretation when making decisions on transparency). Certain research outputs, such as clinical trials data, are subject to specific transparency requirements<sup>32</sup>.

A focus on research integrity is in the interest of retaining the **credibility of research** in general. Some of our member organizations, such as the British Neuroscience Association, are working to improve credibility of their field of research (see the BNA's Credibility in Neuroscience campaign<sup>33</sup> and their support for Hong Kong principles for assessing researchers<sup>34</sup>). The five principles are: (a) Assess responsible research practices; (b) Value complete reporting; (c) Reward the practice of open science; (d) Acknowledge a broad range of research activities; (e) Recognise essential other tasks like peer review and mentoring. In addition to valuing responsible research practices, full and open reporting, and efforts to ensure reproducibility, the

<sup>29</sup> UKRI Funding Policies: <https://www.ukri.org/about-us/policies-standards-and-data/good-research-resource-hub/research-integrity/>

<sup>30</sup> UKRI Funding Assurance Programme: <https://www.ukri.org/about-us/policies-standards-and-data/funding-assurance-programme/>

<sup>31</sup> Bellingan, L., 2020. Coping with COVID. [online] RSB. Available at: <https://thebiologist.rsb.org.uk/biologist-opinion/coping-with-covid> [Accessed 13 April 2022].

<sup>32</sup> Universities lack of transparency on clinical trials 'deeply disappointing'. In 2019, the Chair of the Science and Technology Select Committee, Norman Lamb MP, has written to over forty UK universities to ensure they are complying with clinical trials transparency requirements. <https://committees.parliament.uk/committee/135/science-and-technology-committee/news/101057/universities-lack-of-transparency-on-clinical-trials-deeply-disappointing/>

<sup>33</sup> <https://www.bnacredibility.org.uk/>

<sup>34</sup> <https://wcrif.org/guidance/hong-kong-principles>

Hong Kong principles highlight a need to better recognise contributions that are often overlooked in the current system - such as mentoring and peer review. Three key research practices, on which the BNA is focusing with the aim to improve credibility, are open access publishing, sharing of data and materials and preregistration of hypothesis-testing experiments. Future research assessments should build further on open access, open data/materials and preregistration requirements, where appropriate for a discipline and in consultation with the academic community.

When considering positive impacts on **research careers**, we would encourage institutions to develop clear and concise development and competency frameworks that can ensure the fair evaluation of performance. Future REFs could look at how HEIs invest in training and provide beneficial opportunities for their staff, recognising the importance of professional development and maintenance of agreed standards by, for example, encouraging employees to work towards professional registration<sup>35</sup>. One of our members discussed the issue of researcher's mobility and the impact on their wellbeing and life choices. The Stern review stated that "movement of researchers between institutions should not be discouraged"<sup>36</sup> and cited an OECD document that calls the phenomenon "brain circulation" remarking that "stayers are more likely to publish in journals of lower quality"<sup>37</sup>. A criticism towards this correlation between mobility and quality of research output is that it fails to take into consideration the impact on researchers' lives and resulting opportunity costs to their research. Over the course of 20 years, Emmanuelle Charpentier, the Nobel Prize-winning pioneer of CRISPR gene editing, has worked at "9 different institutes in 5 different countries"<sup>38</sup>. That required moving institution and potentially country on average every 2.5 years, while dealing with respective short-term employment contracts and their impact on personal finances. The question remains whether this kind of 'lifestyle', partly encouraged by current academic reward systems, is an optimal and stable solution to the quest for researchers' productivity and wellbeing, for example by expanding their knowledge, skills and networks, or whether it leads to loss of talent from academia.

We should also raise the fact the current REF structure, particularly its timeframe, limits the achievement of the research integrity objectives. Options (a) and (b), that are impacts on research careers and on equality, diversity and inclusion, need rather speedy actions at the institutional level that are beyond the current remit of REF. Currently, option (d), the impact on inter- and transdisciplinary research, is a weakness of the exercise. Finally, a short-term focus in the submissions and the need for outputs militates against open research and to some extent against collaborations.

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<sup>35</sup> The Royal Society of Biology, (2017). Response from the Royal Society of Biology to the House of Commons Science and Technology Committee on measures taken to close the STEM skills gap. Paragraph 21, page 5.

<sup>36</sup> Department for Business, Energy & Industrial Strategy, (2016). Research Excellence Framework (REF) review by Lord Nicholas Stern: Building on success and learning from experience. Available at <https://www.gov.uk/government/publications/research-excellence-framework-review>

<sup>37</sup> OECD (2013) Researchers on the move: The impact of brain circulation. Available: <https://www.oecd.org/sti/researchers-on-the-move-the-impact-of-brain-circulation.pdf>

<sup>38</sup> Abbott, Alison (2016) The quiet revolutionary: How the co-discovery of CRISPR explosively changed Emmanuelle Charpentier's life, Nature, vol. 532, no. 7600, pp. 432-434, available online at: <https://doi.org/10.1038/532432a>

### Section three: identifying research excellence

9. Which of the following elements should be recognised and rewarded as components of research excellence in a future assessment exercise?

(Multiple options: 'Should be heavily weighted' – 'Should be moderately weighted' – 'Should be weighted less heavily' – 'Should not be assessed' – 'Don't know')

- a. Research inputs (e.g. research income, internal investment in research and in researchers)
- b. Research process (e.g. open research practices, collaboration, following high ethical standards)
- c. Outputs (e.g. journal articles, monographs, patents, software, performances, exhibitions, datasets)
- d. Academic impact (contribution to the wider academic community through e.g. journal editorship, mentoring, activities that move the discipline forward)
- e. Engagement beyond academia
- f. Societal and economic impact
- g. Other (please specify).

10. Do you have any further comments to make regarding the components of research excellence?

It is impossible for us to unambiguously weight the options in question 9 because we did not get consensus in the exact choices/weighting in our sample of respondents. However, we can highlight more and less important areas, and provide a range of views and opinions about them.

All of these factors play a role in determining research quality and volume but what matters most is how future REFs will evaluate and reward them specifically and through what mechanisms. We look forward commenting on more detailed proposals in time but also appreciate this early consultation because it is vital to involve the academic community ahead of the deep changes that may significantly alter research assessment in the future.

While the central purpose of the REF needs to remain, including the assessment of research outputs and impacts, future exercises should incorporate additional and novel ways to evaluate **research culture** – and therefore incentivizing good practice – within environment, outputs and impact. The clear communication of the purpose of the metrics, the assessment techniques, the weighting rationale, and the advice to assessors can also demystify the process for researchers. We encourage the funders to engage with the sector about ways to highlight and evaluate the culture elements in future REFs early on.

UKRI chief executive officer, Dame Ottoline Leyser FRSB, commented in a 2020 piece that: (1) work that focuses on reproducibility and generality is rarely realized as excellent even though it is essential for scientific progress; (2) the definition of excellence should be more broad and



open minded, and not just focus on high-impact papers; (3) excellence should be equally and appropriately applied to blue skies (discovery) and applied research without valuing one over the other.

Views from our members also show that the **definition of excellence** is complex and evolving, and should include further dimensions than those traditionally evaluated through REF, and popularly believed to be evaluated through the REF. There is criticism towards the misguided association between high-profile research fields and the concept of excellence. Novel areas that draw attention and funding (e.g. molecular techniques and AI) produce outputs and knowledge that is important and excellent but we also hear regret from the community that there is often little integration between high-profile and other more traditional approaches (e.g. whole organism biology and taxonomy). Driving increased separation between the field biologist and molecular biologist, with the loss of perspective this could bring, would be a poor outcome. Fundamental research questions can occur in all areas of biological research, and can therefore their contribution can be reflected in frameworks of excellence.

The REF should address both the **applications of research and novel discovery research**. The allocation of resources under these headings will be a subject for debate, but investing in discovery research for future application is critically important as well as the reward for current application. Among arguments, we hear concerns that the current system does not favour an approach of balanced value for applied and discovery research.

To date the REF processes have focused on novelty in research. Other types of research, such as confirmatory research and research which brings together related information should also be rewarded.

**Interdisciplinary research** has always been difficult to judge as such research may not be world-leading in the individual disciplines involved; while REF2014 tried its best with this, passing papers to other panels, a better system is needed. Feedback from the sector about the changes introduced in REF2021 through the establishment of an Interdisciplinary Research Advisory Panel should be considered.

**Research process** is the element that most of our respondents highlighted as central to high-quality research, therefore it should be properly recognized and rewarded in future REFs. There is general agreement that this is particularly relevant given the stated purpose of the REF of providing accountability for public spending. Furthermore, it matters as a way to assure that evidence is generated and communicated properly, strengthening its value in the face of current levels of misinformation in the news and social media.

Within the research process, **collaboration** is an aspect on which our respondents focused particularly. In the submission to the Stern review in 2016, the RSB commented that: “some features of the current REF could act as a barrier to collaborations across different sectors and



within institutions themselves. Collaborations across different sectors for example, can be hampered by differing priorities of organisations in different fields. Although the REF might encourage collaborations between academics and research users through rewarding impact beyond academia, we hear that it can also hamper such collaborations if the two sides cannot agree on a research question because some are driven by REF considerations and others are not. For example, universities might prioritise research questions which are more likely to result in publication at the expense of others of practical interest to a commercial partner. In other words, a tension might exist between the excellence of the research as measured by publication in scientific journals and its real world relevance. [...] There is also a danger that the REF could inhibit collaborations by over-incentivizing REF performance of individual institutions and competition for paper authorship. [...] Moreover, anecdotal evidence suggests that different UoAs use different criteria in assessing authors' contributions. A potential solution would be to request that each author's role is clearly stated prior to publication, in order to make it easier to assess the extent of each contribution. This is already implemented by some journals<sup>39</sup>.

Some of the difficulties related to **authorship** attribution and research contribution remain valid today. Large collaborative projects are often essential to make progress, particularly in interdisciplinary research areas. However, different institutions have different opinions on who should be named and this differs between countries. For example, some cultures will always want to include the head of the group/department as an author despite minimal direct input. Regarding the journals, there is a huge range in journal rules as to how many primary authors are allowed and how to classify the remaining people who may have been involved. Some of these contributors may appear as part of a consortium list, which is at the front after the primary authors in some cases, while in others it is buried at the back in the acknowledgements section. In practice, this results in actual research contributions being misattributed (either people who did little, or indeed nothing, getting recognition while others who did a lot having their contribution diluted out). This can be a real problem for a staff member who may have spent most of their research time contributing to large international research projects.

Changes previously made by REF, such as to require a minimum of 1 and average of 2.5 outputs per academic, compared to the 4 outputs per academic before, did help with collaboration but REF still has the potential to cause barriers.

As mentioned above, publishing models are still part of the problem where the need to be first author still persists, also the perception of where you publish still matters to an extent, more than the open access sharing of the results. Open access policy enacted by the funders may drive positive change in the future.

Most of our respondents suggested reducing the weighting of **research inputs**. They fear this could be a source of inequity and a barrier to progressive change. It has been suggested that

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<sup>39</sup> The Royal Society of Biology, (2016). Response from the Royal Society of Biology to the independent review of the Research Excellence Framework chaired by Lord Stern. URL: [https://www.rsb.org.uk/images/pdf/FINAL\\_RSB\\_response\\_to\\_Stern\\_Review.pdf](https://www.rsb.org.uk/images/pdf/FINAL_RSB_response_to_Stern_Review.pdf)

very well-funded institutions seem to produce more output and impact. However, others point to empirical evidence about the so-called ‘Matthew effect’ in science funding, whereby “scientists who have previously been successful are more likely to succeed again, producing increasing distinction”. Empirical research has found “no evidence that winners’ improved funding chances in subsequent competitions are due to achievements enabled by the preceding grant”. The study however shows that the ‘Matthew effect’ “operates through two mutually reinforcing processes: on the demand side, candidates who won prior awards are evaluated more positively than nonwinners, while on the supply side, scientists who were successful in past contests select themselves into applicant pools of subsequent contests at higher rates than unsuccessful scientists”<sup>40</sup>. Based on their own empirical research, other authors have similarly suggested “that funding strategies that target diversity, rather than ‘excellence’, are likely to prove to be more productive”<sup>41</sup>, and have recommended proportionately smaller grants to a large number of researchers, over larger grants to a smaller number of recipients.

To conclude, research income is not a reliable indicator of research excellence. On the other hand, consideration of internal investments in research and in researchers could be explored but would depend on what sort of investments they are and towards what goals.

The relationship between REF and future funding opportunity, such as applications for UKRI grants, should not be made. There are pockets of excellent research across the HEI landscape and bright ideas may originate in less established institutions, therefore the temptation to limit applications to high-scoring departments should be avoided.

**Outputs** have been the main focus of previous REFs and one of the main indicators of research productivity across different academic reward systems, albeit with their own shortcomings. Some of our members suggested that given the consolidated role of the outputs and the need to shift priorities towards supporting a better academic environment and culture, these could be less heavily weighted in the future. Other members, on the other end, suggested keeping a focus on these.

For the other elements (**academic impact, engagement beyond academia, societal and economic impact**) our members reported mostly the view that they should be either assessed as they are and less heavily in some cases. A factor that pushes for lighter weighting is the time and cost required to produce **impact case studies**, which have inflated over time at the cost of other activities. There is also a caveat if the weighting for **academic impact** (including other tasks beyond research itself) increases – members highlighted a potential inequity aspect of this, for example, that it could be a disadvantage for those academics who have specific personal circumstances precluding wider engagement (caring responsibilities etc.). However, these are

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<sup>40</sup> Bol, Thijs; de Vaan, Matthijs; van de Rijt, Arnout (2018) The Matthew effect in science funding, PNAS, vol. 115, no. 19, pp. 4887-4890, available online at: <https://doi.org/10.1073/pnas.1719557115>

<sup>41</sup> Fortin, Jean-Michel; Currie, David J. (2013) Big Science vs. Little Science: How Scientific Impact Scales with Funding, PLOS ONE, vol. 8, no. 6, article number e65263, available online at: <https://doi.org/10.1371/journal.pone.0065263>

the circumstances in which institutional support for wider roles in the academy, discipline or sector becomes important. In consideration of these complexities, upcoming consultations of future REFs must distinguish the different aspects of academic impacts that are under consideration for assessment in more depth and detail, so our feedback can be more specific and directed. There is an interesting skepticism towards the **socio-economic impact** which respondents say is not always apparent within the timeframe of the assessment or should be assessed more independently. Historically, research that turned out to be important in terms of social and economic impact did not always have immediate, or REF time-frame effect. The suggestion of higher weighting of elements d,e,f in question 9 resonated with those who favour a move away from the older paradigm of ‘money-in/papers-out’ and towards an assessment of processes and culture.

11. Are the current REF assessment criteria for outputs clear and appropriate? (Yes/No/Don't know)
- Originality
  - Significance
  - Rigour

12. Do you have any further comments to make regarding the criteria for assessing outputs?

Different HEIs are recognised as interpreting and implementing the criteria differently, with an underlying variability in how the system operates, and the differing burden that REF poses at HEIs is partly due to that.

Our members have also previously flagged the widely-held position that citation-based indices such as H index, which derives from citations, are inherently biased as they depend on networks and other academics being sufficiently aware of a colleague's research to cite them. This disproportionately affects those researchers with smaller networks or in more niche areas of academic study<sup>42</sup>.

While recognising that improvements have been made in the types and number of outputs that can be submitted, we are aware of an appetite for more guidance and clarity to help explore and use the full breadth of potential outputs.

13. Are the current REF assessment criteria for impact clear and appropriate? (Yes/No/Don't know)
- Reach
  - Significance

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<sup>42</sup> The Royal Society of Biology, (2018). Response from the Royal Society of Biology to the UK Higher Education Funding Bodies consultation on REF 2021 draft guidance on submissions, panel criteria and working methods. URL: [https://www.rsb.org.uk/images/Policy/RSB\\_Response\\_to\\_REF2021\\_consultation\\_on\\_draft\\_Guidance\\_to\\_Submissions\\_Panel\\_Criteria\\_and\\_working\\_methods.pdf](https://www.rsb.org.uk/images/Policy/RSB_Response_to_REF2021_consultation_on_draft_Guidance_to_Submissions_Panel_Criteria_and_working_methods.pdf)

#### 14. Do you have any further comments to make regarding the criteria for assessing impact?

Again, underlying variability in how HEIs interpret and implement the guidance may apply.

There is still need to deepen understanding of how impact accrues and is assessed as part of a research assessment process.<sup>43</sup> REF assessors will always need to make balanced judgements, for example about whether research on a rare genetic disease that generates a high impact for a few people counts equally to research that generates a smaller benefit but for more people, and such valuations cannot be a precise science nor should they be.

In relation to a definition of impact we commented previously that: “overall, the experience of the past REF provided a valuable learning opportunity for the life sciences academic community to better understand the many forms that impact can take, and the current criteria are sufficiently broad and flexible. We encountered concern that a prescriptive definition of impact could act against fundamental [discovery] research, which by its nature is less focused on immediate impact than more applied research. However, it must be recognized that a loose definition of impact does not allow for easy comparison across and between disciplines, and is more difficult to handle at an institutional level. [...] There is also a risk that a narrow focus on impact intended as commercial applications could encourage a culture of short-termism in which longer-term and less immediately applicable research is neglected. More theoretical research for which no immediate applications are envisioned should not be penalised. Indeed, evidence suggests that commercial users of research see the production of knowledge and the training of skilled people as the most valuable impact of university research, rather than the university’s direct commercial outputs. [...] Another risk is that a concentration on international excellence as the highest accolade is not always encouraging of local impact and engagement. Impact of university research teams on local industry should be recognized and encouraged. This impact is often achieved through collaborations and flow of people, such as CASE studentships. [...] A focus on published journal articles as an indicator of a researcher’s quality also penalizes those with industry experience, whose research experience might not be captured by such outputs, especially in the years before any research impact is REF reportable.”

These observations are echoed by members still. Particularly, there is concern that the emphasis on impact for papers, albeit understandable, might penalize discovery science focused on understanding natural phenomena, the impact of which are less certain and may appear later on. There is also supports for eligibility of continued impact case studies in

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<sup>43</sup> In 2016, in our response to the Stern review, the Society stated that: “in the context of the REF, ‘impact’ was defined as ‘an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia’. There is a perception that, while what exactly constituted impact was not clear at the outset of the previous REF in 2014 and indeed during much preparation for the assessment, a great deal has been learned. In effect the assessment varied across panels, reflecting the specific knowledge of different communities of practice, and different disciplines. Although economic impact has sometimes been a focus of attention in relation to the REF, we are pleased to see increasing importance given to avoided costs and non-fiscal benefits of research to society, policy, health, wellbeing and environment within impact discussions by all sectors”.

recognition of longer lead-in time for impacts of research projects whose initial scientific groundwork was done (often long) before the impact could be assessed<sup>44</sup>.

15. Are the current REF assessment criteria for environment clear and appropriate? (Yes/No/Don't know)
- Vitality
  - Sustainability

16. Do you have any further comments to make regarding the criteria for assessing environment?

One more senior member said that criteria for vitality and sustainability are both clear and appropriate, while another senior member added that sustainability is a more challenging criterion without stable or longer-term funding.

One aspect brought to our attention is the **subjective** nature of the template for the **environment statement**. This is a narrative piece that may lack the precision of some of the more quantitative indicators. However, quantitative indicators could prove useless if they are not robust or meaningful in this context. A member suggested that site visits to institutions may allow elements of the environment statement to be examined and drive robustness of the assessment. In evaluating how the institutional research environment can support a positive research culture, attention will need to be paid to educational interventions and training for research staff.

Previously, we also commented on the importance of an environment that supports the “up-skilling [of] academic researchers in entrepreneurial skills and commercial sense, as well as industry processes and legalities. Explicit recognition of appropriate, beneficial mobility of staff between sectors in the environment section, which may counteract disincentives to such mobility elsewhere in the REF, could be valuable”<sup>45</sup>. However entrepreneurial skills are just one example of broader **training and professional development** that should be offered to research staff, particularly early career researchers, in order to help them navigate multiple potential career paths.

**Collaborations beyond academia** could be better recognised by REF.<sup>46</sup>

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<sup>44</sup> The Royal Society of Biology, (2018). Response from the Royal Society of Biology to the UK Higher Education Funding Bodies consultation on REF 2021 draft guidance on submissions, panel criteria and working methods. URL: [https://www.rsb.org.uk/images/Policy/RSB\\_Response\\_to\\_REF2021\\_consultation\\_on\\_draft\\_Guidance\\_to\\_Submissions\\_Panel\\_Criteria\\_and\\_working\\_methods.pdf](https://www.rsb.org.uk/images/Policy/RSB_Response_to_REF2021_consultation_on_draft_Guidance_to_Submissions_Panel_Criteria_and_working_methods.pdf)

<sup>45</sup> The Royal Society of Biology, (2017). Response from the Royal Society of Biology to the HEFCE consultation on the 2nd Research Excellence Framework. URL: [https://www.rsb.org.uk/images/RSB\\_response\\_to\\_the\\_HEFCE\\_consultation\\_on\\_the\\_2nd\\_REF\\_Final\\_response.pdf](https://www.rsb.org.uk/images/RSB_response_to_the_HEFCE_consultation_on_the_2nd_REF_Final_response.pdf)

<sup>46</sup> “Possible indicators of universities’ collaboration beyond higher education may include: industrial income from a broad range of activities; percentage of staff with industrial (and other organisational) collaborations and co-authorships (this could also include collaboration with the public sector or with NGOs); participation of academics on advisory boards; number of industry (and other organisational) representatives invited to give research seminars; presence of licensing and spin out organisations; presence of initiatives to attract collaborations with other organisations (e.g. matched funding schemes, translational shared spaces); efficiency of collaborative agreements; number of student placement; number of staff (or percentage of staff time) dedicated to liaison/ contract role. However, it must be noted that such indicators should be used in combination and with care, so that particular routes for Collaboration are not artificially incentivized”. Extract from: The Royal Society of Biology, (2017). Response from the Royal Society of Biology to the HEFCE consultation on the 2nd Research Excellence Framework. URL: [https://www.rsb.org.uk/images/RSB\\_response\\_to\\_the\\_HEFCE\\_consultation\\_on\\_the\\_2nd\\_REF\\_Final\\_response.pdf](https://www.rsb.org.uk/images/RSB_response_to_the_HEFCE_consultation_on_the_2nd_REF_Final_response.pdf)



A REF-based performance incentive must not be at the expense of the other aspects of universities' objectives, such as **training and teaching**. Indeed, a breadth of research activity should be required in order to support the breadth of teaching activity in the institution, if universities are to continue to have a research-led teaching agenda.

The separation of staff into research-active and teaching-only categories does not fit with this research-led teaching strategy.

The RSB community has previously suggested that the following aspects should be pursued to strengthen **research integrity and accountability**:

- The institutional environment should empower researchers to raise alarms or question dubious data without fear of retaliation or detrimental impacts on their career prospects. A greater show of support by fostering relationships and creating safe spaces could decrease reluctance to communicate details about a fraudulent activity or voluntarily correct their errors<sup>47</sup>.
- Open research policies should require that relevant materials, data, code, and associated protocols with the required statistical analysis is made available. Data repositories encourage transparency and enable the reproduction and validation of findings.
- Continuous training for research staff should embed good practice in data generation, management and communication<sup>48</sup>. In addition, CPD is a route to ensuring that high ethical standards are being met<sup>49</sup>, and the adoption of 'team science', where appropriate, can assist with peer accountability<sup>50</sup>. Professional associations can aid with provision of training and professional development opportunities.
- The REF could look at examples of grassroots initiatives, such as the UK Reproducibility Network (UKRN), to help develop criteria for assessing & fostering improvements in research culture. A number of UK HEIs have joined UKRN as institutional members through the creation of a senior management role focused on research improvement (the Institutional Lead). The aim is to coordinate efforts to improve research quality – through training, incentives, and other activity – across this consortium of institutions.
- The new Athena SWAN processes includes the interactive effects of multiple equality and diversity issues, which could provide information on the quality of the institutional environment in relation to Equality, Diversity and Inclusion<sup>51</sup>.

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<sup>47</sup> The Publication Plan, 2021. Why loss of confidence in previously published findings does not necessarily lead to self-correction of the scientific record: <https://thepublicationplan.com/2021/08/19/why-loss-of-confidence-in-previously-published-findings-does-not-necessarily-lead-to-self-correction-of-the-scientific-record/>

<sup>48</sup> Royal Society of Biology, 2017. A response to Science and Technology Select Committee inquiry on Research Integrity: <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee/research-integrity/written/48791.pdf>

<sup>49</sup> Science Council CPD Standards: <https://sciencecouncil.org/scientists-science-technicians/benefits-of-professional-registration/professional-development/>

<sup>50</sup> UK Reproducibility Network (institutional leads) evidence submitted to the Science and Technology Committee inquiry into reproducibility and research integrity: <https://committees.parliament.uk/writtenevidence/39679/pdf/>

<sup>51</sup> The Royal Society of Biology, (2017). Response from the Royal Society of Biology to the HEFCE consultation on the 2nd Research Excellence Framework. URL: [https://www.rsb.org.uk/images/RSB\\_response\\_to\\_the\\_HEFCE\\_consultation\\_on\\_the\\_2nd\\_REF\\_Final\\_response.pdf](https://www.rsb.org.uk/images/RSB_response_to_the_HEFCE_consultation_on_the_2nd_REF_Final_response.pdf)



- The inclusion of alternative CV formats such as the one currently piloted by UKRI<sup>52</sup> could be enable researchers at HEIs to highlight how they made a difference to a research or innovation project, team, community or wider society.

## Section four: assessment processes

17. When considering the frequency of a future exercise, should the funding bodies prioritise:

- a. stability
- b. currency of information
- c. both a. and b.
- d. neither a. nor b.
- e. Don't know.

18. Do you have any further comments to make regarding the prioritisation of stability vs. currency of information?

Our respondents agree that **stability** of the assessment is important and flagged the issue that frequent changes to the exercise make the system burdensome and adaptation time consuming. A combination of stability and currency of information is also welcome. Prioritising stability should not come at the expense of correcting the perverse incentives identified and adapting to emerging trends within the academic sector.

The integration of successive assessment exercises over a longer time scale will allow HEIs to plan more long-term.

19. Should a future exercise take place on a rolling basis?

- a. Yes, split by main panel
- b. Yes, split by assessment element (e.g. outputs, impact, environment)
- c. No
- d. Don't know.

20. Do you have any further comments to make regarding conducting future research assessment exercises on a rolling basis?

Our respondents are adverse to the idea of a rolling REF. The main concern, due to current weaknesses in the system, is an increased administrative burden, stress and pressure on research staff. They also fear the risk of short-term targets placed on academics and institutions.

21. At what level of granularity should research be assessed in future exercises?

- a. Individual
- b. Unit of Assessment based on disciplinary areas

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<sup>52</sup> Introducing a better way for you to evidence your contributions - The Résumé for Researchers. <https://www.ukri.org/apply-for-funding/how-were-improving-your-funding-experience/introducing-a-better-way-for-you-to-evidence-your-contributions/>

- c. Unit of Assessment based on self-defined research themes
- d. Institution
- e. Combination of b. and d.
- f. Combination of c. and d.
- g. Other (please specify)

22. Do you have any further comments to make regarding the granularity of assessment in a future research assessment exercise?

Answers to questions 21 were either a 'combination of b. and d.' or a 'combination of c. and d'. Too much granularity does not add anything and can be burdensome, but a Knowledge Exchange Framework (KEF)-type approach may help with achieving the right balance, according to one respondent. Granularity should be sufficient to permit a diverse and representative pool of submission, while maintaining a disciplinary focus. Research areas at the margins of or spanning disciplines must not be disadvantaged though. Finally a 'combination of b and d' might foster a shift towards assessment of processes and culture, which we talked about in Section 2 and 3 of our response.

23. To what extent and for what purpose(s) should quantitative indicators be used in future assessment exercises? (Please select as many as apply)

- a. Move to an entirely metrics-based assessment
- b. Replace peer review with standardised metrics for:
  - i. Outputs
  - ii. Impact
  - iii. Environment
- c. Use standardised metrics to inform peer review of:
  - i. Outputs
  - ii. Impact
  - iii. Environment
- d. Should not be used at all.
- e. Other (please specify)

24. Do you have any further comments to make regarding the use of metrics in a future research assessment exercise?

We recommend maintaining the peer review element of the assessment while minimizing the human cost involved with it. We would consider the use of metrics to assist peer review but there should be multiple different metrics included. Citations is one clear metric but this is affected by when you publish relative to REF cycle. Quantitative metrics need to be sufficiently nuanced and avoid perverse incentives in terms of research landscape, culture and impact on smaller HEIs. Some of our members also recommended exploring the possibility that automation of data

analytics could expand the assessment of outputs beyond a chosen small subset per staff member to reflect more accurately the global and total activity of units.

Previous reports have highlighted the complexity of using metrics: “within the REF, it is not currently feasible to assess the quality of UOAs [units of assessment] using quantitative indicators alone”<sup>53</sup>. The metric tide report also outlines that: “for the impact component of the REF, it is not currently feasible to use quantitative indicators in place of narrative impact case studies, or the impact template.” The review includes a set of recommendations on the use of metrics in UK HE.

Some of our members recommended improvements in the selection process for REF expert panel members and assessors, which represents a critical endpoint in the assessment process. Whilst it is important that peer review is used, REF panel experts, who may be from the same field of research of the academics submitting the outputs for evaluation, could be competitors leading to academic tensions, which could bias outcomes. We recommend that the appointment of assessors and the peer-review process is transparent, avoids possible conflicts of interest and is perceived as rigorous and trustworthy by the academic community.

## 25. How might a future UK research assessment exercise ensure that the bureaucratic burden on individuals and institutions is proportionate?

The 2015 RAND report<sup>54</sup> concluded that the bureaucratic burden of the REF is perceived to outweigh the benefits and this was one of the most frequently mentioned reasons for negative attitudes towards REF. The report states: “while the intention of the Stern Review and rhetoric from the funding bodies following the review of REF 2014 had been to reduce the burden, the perception was that this had not materialised in practice”. Furthermore, “the perceived burden compared with the perceived benefits resulting from the REF was argued to differ depending on an individual’s role in the process and their level of participation in REF preparations”. “Reducing the administrative burden on institutions was also suggested as being important. Institutional leaders and REF managers stressed that adding new components to the REF created additional complexity and that systems were required to collate and audit data to comply with these requirements”.

In line with these considerations, we expect that REF will always have an administrative burden because of the associated funding and its importance for universities, which will spend time and resources to select their strongest returns. However, better communication about the purpose and priorities of the exercise, and the development of clearer guidance and appropriate metrics could reduce burden on HEIs staff.

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<sup>53</sup> Wilsdon, J., et al. (2015) The Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management, available online at: <https://www.doi.org/10.13140/RG.2.1.4929.1363>

<sup>54</sup> Manville, C., et al. (2015). Preparing impact submissions for REF 2014: An evaluation: Approach and Evidence. Santa Monica, CA: RAND Corporation, 2015. [https://www.rand.org/pubs/research\\_reports/RR726.html](https://www.rand.org/pubs/research_reports/RR726.html).

## Appendix 1: Member Organisations of the Royal Society of Biology

### Full Organisational Members

Agriculture and Horticulture Development Board  
 Anatomical Society  
 Association for the Study of Animal Behaviour  
 Association of Applied Biologists  
 Association of Reproductive and Clinical Scientists (ARCS)  
 Biochemical Society  
 British Association for Lung Research  
 British Association for Psychopharmacology  
 British Biophysical Society  
 British Ecological Society  
 British Lichen Society  
 British Microcirculation and Vascular Biology Society  
 British Mycological Society  
 British Neuroscience Association  
 British Pharmacological Society  
 British Phycological Society  
 British Society for Cell Biology  
 British Society for Developmental Biology  
 British Society for Gene and Cell Therapy  
 British Society for Immunology  
 British Society for Matrix Biology  
 British Society for Neuroendocrinology  
 British Society for Parasitology  
 British Society for Plant Pathology  
 British Society for Proteome Research  
 British Society for Research on Ageing  
 British Society of Animal Science  
 British Society of Soil Science  
 British Society of Toxicological Pathology  
 British Toxicology Society  
 Daphne Jackson Trust  
 Fisheries Society of the British Isles  
 Fondazione Guido Bernardini  
 GARNet  
 Gatsby Plant Science Education Programme  
 Genetics Society  
 Heads of University Centres of Biomedical Science  
 Institute of Animal Technology  
 Laboratory Animal Science Association  
 Linnean Society of London

Marine Biological Association  
 Microbiology Society  
 MONOGRAM – Cereal and Grasses Research Community  
 Network of Researchers on the Chemical Evolution of Life  
 Nutrition Society  
 Quekett Microscopical Club  
 Society for Applied Microbiology  
 Society for Experimental Biology  
 Society for Reproduction and Fertility  
 Society for the Study of Human Biology  
 South London Botanical Institute  
 The Field Studies Council  
 The Physiological Society  
 The Rosaceae Network  
 UK Environmental Mutagen Society  
 United Kingdom Society for Extracellular Vesicles  
 University Bioscience Managers' Association  
 Zoological Society of London

### Supporting Organisational Members

Animal & Plant Health Agency (APHA)  
 Association of the British Pharmaceutical Industry (ABPI)  
 AstraZeneca  
 BioIndustry Association  
 Biotechnology and Biological Sciences Research Council (BBSRC)  
 British Science Association  
 Ethical Medicines Industry Group  
 Fera  
 Institute of Physics  
 Medical Research Council (MRC)  
 NNedPro Global Centre for Nutrition and Health  
 Northern Ireland Water  
 Porton Biopharma  
 Royal Society for Public Health  
 Severn Trent Water  
 Syngenta  
 Understanding Animal Research  
 Unilever UK Ltd  
 United Kingdom Science Park Association  
 Wellcome  
 Wessex Water  
 Wiley Blackwell  
 Ecological Continuity Trust