

A response from the Royal Society of Biology to the HEFCE consultation on the 2nd Research Excellence Framework

17 March 2017

Overall approach

1. Do you have any comments on the proposal to maintain an overall continuity of approach with REF 2014, as outlined in paragraphs 10 and 23?

The Society supports the broad aims and objectives of the Research Excellence Framework (REF) and has previously stated that the REF and its predecessor Research Assessment Exercise (RAE) acted to encourage research excellence and to embed a focus on demonstrating the public benefit delivered for public investment. Broadly speaking, measures of output, impact and environment have served the exercise well and are well-accepted in the community.

However, the exercises have been associated with unintended negative influences and it is important that future exercises act to minimise these. Communication and guidance on both submission criteria and evaluation for the next assessment period should take account of emerging trends in working practices and accommodate multiple authorship, collaborations, part-time staff and multidisciplinary research.

Unit of Assessment structure

2: What comments do you have about the Unit of Assessment structure in REF 2021?

Expert panels

3a. Do you agree that the submissions guidance and panel criteria should be developed simultaneously?

Early communication, and clear guidance, on both submission guidance and panel criteria would be beneficial to researchers, institutions and potential panellists. Internal consistency will be required and therefore the simultaneous development is sensible. It will be important to ensure that panels have the capacity to assess pragmatically all study types that might arise, including in interdisciplinary studies.

3b. Do you support the later appointment of sub-panel members, near to the start of the assessment year?

The key issue is the expertise represented on the sub-panels and whether this reflects and can accommodate the likely range of returns. Timing should be appropriate to allow planning for the necessary time commitment within the work planning cycle, and to ensure that sub-panellists can thoroughly embed the ethos to criteria in their assessment.

Charles Darwin House, 12 Roger Street, London WC1N 2JU Tel: +44 (0)20 7685 2550 info@rsb.org.uk
www.rsb.org.uk

4. Do you agree with the proposed measures outlined at paragraph 35 for improving representativeness on the panels?

It is important that panels are representative, both in terms of equality, diversity and inclusion criteria and also of course in terms of community representation and approval. The strategy outlined (Para 35) is a good one, including providing training and advice for selection panels and chairs, and including unconscious bias training for chairs. The value of this training is not only in informing the selection of panels and sub-panels but also, eventually, in the assessment of submissions and in this regard training for all panellists would be welcome. Later, we recommend the distribution of information widely to inform and remind institutions and staff to be returned of the steps taken, so as to encourage them to anticipate assessment according to progressive criteria and not in accordance with any expected bias.

5a. Based on the options described at paragraphs 36 to 38 what approach do you think should be taken to nominating panel members?

Members have shown support for the proposals regarding equality and diversity (E&D) in paragraph 37 of the document setting out proposals for 'Representativeness of the expert panels'. This support covers ensuring that nominating bodies more carefully consider equality and diversity when nominating candidates and when laying out their own equality and diversity policies. Members suggest that protected characteristic data is recorded.

We agree with the concern that an open nomination process for sub-panels could become unwieldy. Open nomination would require supporting evidence and assessment of representation and is likely to require some recreation of the assessment provided by the panel of nominating bodies.

5b. Do you agree with the proposal to require nominating bodies to provide equality and diversity information?

Nominating bodies should provide as much information as possible about their nominees in this regard.

6. Please comment on any additions or amendments to the list of nominating bodies, provided alongside the consultation document.

The "Institute of Ecology and Environmental Managers" should be updated to "Chartered Institute of Ecology and Environmental Management". The "Society of Biology" should be recorded as the "Royal Society of Biology". Furthermore, grouping nominating bodies into categories might be useful for the assessment of representation.

Staff

7. Do you have any comments on the proposal to use HESA cost centres to map research-active staff to UOAs and are there any alternative approaches that should be considered?

Whilst it may offer some degree of accounting consistency there is concern that using HESA cost centres to map staff to UoAs would be inappropriate. There are already some ambiguities in the HESA classification – it is important not to replicate these in the REF. (For example, if a researcher working in a

medical faculty submits papers in chemical biology, but the assigned UoA must be Biomedical sciences, the papers may be assessed by a panel with expertise that does not broadly correlate.)

8. What comments do you have on the proposed definition of 'research-active' staff described in paragraph 43?

The inclusion of staff with reasonable responsibility for research, as proposed in the Stern Review, has significant support. Guidance for institutions will be important to achieve a consistent approach and to ensure that research-active staff are not side-lined because their institutions do not anticipate that they will have outputs to make an attractive report from their perspective. There is potential for game-playing by contract alteration; this is causing concern amongst some staff. A single census date is also not preferred; a sample taken over the whole or major portion of the REF period is preferred.

9. General comments on the decoupling of staff from output.

Decoupling staff from outputs may benefit academic staff who contribute to the success of universities by devoting part of their time to teaching or administrative roles, as well as those who participate in public or policy outreach. This would decrease the pressure on such staff to publish more research at the expense of these teaching or valuable administrative activities, which are also essential to university excellence.

There is concern that decoupling staff and output may result in priority given to established scientists, with underrepresentation of early-career researchers (ECR). This could discourage the ECR group and give an inaccurate overall picture of research activity at the institute. However, there is also a possibility that decoupling could benefit junior researchers, by reducing the onus to produce four excellent outputs in a short time frame.

There REF could inhibit collaborations by over-incentivising REF performance of individual institutions and competition for papers authorship. At certain institutions, because of concern for proper supervision of PhD students, each student must have a supervisor and a co-supervisor, both of whom are likely to be sufficiently closely involved in the student's research to be considered as joint authors on any papers. In terms of assessment of the level of contribution by co-authors, sub-panels could consider auditable criteria what merits 'significant' contribution.

Additionally, research collaborations and consortia are an increasing trend in fields such as biomedical and veterinary research, where a large number of individuals from several institutions may have contributed significantly to research outputs such as publications. REF2021 should seek to encompass both flexibility and clarity in the submission guidelines in light of this, to take into account the fact that, for example, some consortia choose to publish papers in the overall name of the consortium, rather than listing multiple authors.

Trends in journal requirements can shift the options available to authors in some areas in terms of the power of their papers (i.e. whether all of a study is in a single paper, or must be sectioned into a series of papers, or appear as a synopsis paper with extensive supplementary material) and this is particularly relevant in fields where there are few journals of choice.

9a. The proposal to require an average of two outputs per full-time equivalent staff returned?

The focus on returning four high-profile papers to the first REF, raised concerns that projects were being combined into a single paper, for which only a few authors get real credit. Ensuring that author contribution

is fairly evidenced is non-trivial. Writing up research results into a paper is a crucial part of a scientist's training, and combining several projects into a single paper could deny many of those involved the opportunity to gain experience and credit. These types of concern will remain relevant to strategy in relation to REF2021, although in some cases the REF influence was seen as a positive influence on publication strategy.

Specifically, there is concern that an average of two papers per FTE could reduce attention to papers that are unlikely to be submitted but which are important career steps for early-career researchers. ,

The proposal to give a range of the number of outputs that can be submitted could help alleviate this issue. Pressure to produce publications likely to get high REF scores could lead to valuable research being delayed or held back from publication. However, some members feel that when research is held back for big papers, what is produced is superior and of higher significance by comparison to what may be described by many, smaller papers published at the time when the research results are generated.

One potential unintended influence of an average of 2 outputs per FTE staff could be a preference for staff working in fields more likely to produce REF-eligible outputs. This was noted by members in relation to the prescribed return of four outputs per member of staff under REF2014 as leading to an imbalance reflected in the disciplines being researched and taught. This trend could continue with certain disciplines being over-represented and fewer staff available for research-led teaching in others. For example, whole organism biology and disciplines such as taxonomy have been under-valued, and in some areas are no longer taught. This is also leading to students being pushed to narrower choices rather than maintaining a rounded curriculum.

Whilst a complete decoupling of staff from outputs (i.e. no prescribed number or average number of outputs per staff member) could act to remedy this issue, it would of course come with potential issues of its own: it could prove difficult to assess and there would be risk of all outputs from any one HEI being derived from a small number of individuals.

With this in mind, setting a maximum number of outputs per staff member could be a more appropriate remedy to the issue of imbalance in the disciplines (and related effects on recruitment, research and teaching). However, there are concerns related to this method too- please see section b).

9b. The maximum number of outputs for each staff member?

Concerns have been raised relating to setting a maximum number of outputs in the next REF, in that this could lead to quality papers by some authors not being submitted. Senior lecturers often have co-authorship in a significant proportion of a department's high quality research papers (including interdisciplinary), this may be a consideration.

In addition, it has been brought to our attention that an increasing number of journals have introduced stringent length limitations with regard to both text and figures. As a result, some researchers, in order to publish in their field's journal of choice, publish their research as a series of shorter papers, rather than as a single output. A maximum number of outputs may be a disadvantage in this situation.

9c. Setting a minimum requirement of one for each staff member?

The proposal for setting a minimum requirement has brought a mixture of concerns. A key question (in favour of a minimum of 1) was whether staff (actively in post for a significant period) who did not generate a

single eligible output in 7 years could be considered research active. However, a combination of circumstances (e.g. maternity leave, caring duties and disability, or part-time working and a period of leave), has non-additive and long-lasting effects on volume of research but is not a predictor of quality. Decoupling without a minimum (i.e. zero) could address this, but an exemption from the minimum (if it is 1) across all relevant posts could also be incorporated for circumstances of parental or carer leave as well as for being in post for only a short period of the assessment (with non-portable outputs).

An overarching theme for responses to this question appears to be that decoupling staff from output in the partial manner suggested through prescribing an average number of outputs per staff member may not act to remedy any current trends in underrepresentation of staff who are essential to the research and teaching at the HEI, but produce fewer REF-eligible outputs. These groups include early-career researchers and those working in specific areas e.g. whole organism biology, as well as recently employed. Core skill teaching areas, for example taxonomy and botany, are an important part of rounded curricula, even though research in these areas might result in relatively fewer outputs suitable for submission. In order to maintain a lively and successful life sciences research sector, it is important to ensure that a broad array of research areas are supported and taught. It is vital to ensure that incentives relevant to research excellence do not work against this. Setting of a maximum number of outputs per staff member, though it comes with its own caveats, may act to dampen this trend.

10a. Is acceptance for publication a suitable marker to identify outputs that an institution can submit and how would this apply across different output types?

Acceptance for publication is not always a clear marker and this should be considered. Using the digital object identifier (DOI) as the marker for publication (rather than acceptance for publication) and for the output to be submitted by the institution of the author would be auditable, although it does devolve some of the policing to journals, who would have to ensure that the author's address was that in which the work was done. Members of the Biochemical Society have proposed using something linked to the addresses (including current addresses) listed by the authors on the paper as a balancing tool.

10b. What challenges would your institution face in verifying the eligibility of outputs?

None directly

10c. Would non-portability have a negative impact on certain groups and how might this be mitigated?

Non-portability does not necessarily solve a problem it sets out to answer (HEI-perceived disincentivisation of long-term institutional investment; Stern report paragraphs 72 and 74). There can be an assumption that individuals move only for short term gain, whereas they may in fact move because of poor prospects at their current institution. Some members are concerned that for ECR leaving a large and successful group, a lack of portability could result in some studies never being written up and therefore a loss of some outputs to REF entirely, as what is important to an early stage researcher/new lecturer may be much less important to the research group they have left. Other members have raised the issue that non-portability could discourage institutional investment in career development because the research outcomes of early career researchers hired on externally funded fellowships will be guaranteed to be included in the institution's REF score, irrespective of whether the institution supports their career long-term. It has been suggested that if the REF inclusion is guaranteed there may be a financial incentive to the institution to replace such early career researchers with another externally funded Fellow rather than offer a longer-term contract. This issue could be addressed in the environment section of the assessment.

Furthermore, a focus on non-portability and the REF cycle could have a negative impact on early career researchers, with hiring of new research staff being concentrated in order for those staff to be eligible for the next REF. Therefore, new researchers who qualify between these timeframes could be disadvantaged.

Overall, non-portability for all re-creates the playing field for all with the focus on unit performance.

10d. What comments do you have on sharing outputs proportionally across institutions?

Additionally, proportional sharing may present negotiation difficulties for institutions and clear guidance on how to evidence association with the output would be beneficial.

11. Do you support the introduction of a mandatory requirement for the Open Researcher and Contributor ID to be used as the staff identifier, in the event that information about individual staff members continues to be collected in REF 2021?

Widespread adoption of ORCID IDs is a step in the right direction, and to be encouraged. Some members have suggested that this system should be mandatory and the only system to be used. Publishing members have proposed that ORCID is the most effective way to allow accurate tracking of individual researchers without significant additional administrative burden on researchers or institutions. As ORCID is a not-for-profit organization with broad stakeholder engagement built into its structure it has the ability to evolve and respond to community requirements. Although ORCID registration is free to individuals it must be noted that, a mandate would require publishers to join and implement ORCID, and this does incur a cost. Should the mandate come in, sufficient notice should be given to allow this to be considered from a budgetary or business model perspective, especially for small journals/publishers.

12. What comments do you have on the proposal to remove Category C as a category of eligible staff?

13. What comments do you have on the definition of research assistants?

Generally, members have shown support for the definition of research assistants as laid out in REF 2014.

14. What comments do you have on the proposal for staff on fractional contracts and is a minimum of 0.2 FTE appropriate?

Assessment criteria and clear statements would be very helpful in ensuring that any changes here are fair and consistent. Some early career lecturers are appointed at 0.2 FTE research or below and a significant teaching commitment. They will aim to grow their research presence over time; any change that precluded them from the REF would be a concern for their research ambition. This could be solved with clear criteria for assessment of direct contributions to research activity within an institution, but it may not be easy to set criteria that are easily policed.

There is a growing practice in the pharmaceutical industry of staff having joint appointments with a proportion of their time embedded in research institutions, especially in clinical or translational research; the contract proportion is appropriate to these kinds of appointments.

Collaboration

15. What are your comments in relation to better supporting collaboration between academia and organisations beyond higher education in REF 2021?

Collaborations, are often the best means to advance research, rather than an end in themselves; the value of academic-industrial collaboration should, and does, receive credit beyond any potential impact on REF submissions. Rather than promoting collaborations per se, the REF should foster permissive conditions that allow research to flourish, removing unintended barriers to fruitful collaborations across disciplines, sectors and institutions.

The continued assessment of impact, has significantly changed the academic culture towards being collaborative and open to early and strong engagement with industry. REF should recognise and accommodate mobility between sectors, and not become a barrier to movement. Including additional indicators of collaboration in the environment section, is also important.

A focus on published journal articles does not reward those working with industry, especially in the years before any research impact is REF reportable. In cases where there is a possibility of establishing a patent there may be delays before publication or other outputs from the related research. 'Commercial confidentiality' (or 'academically sensitive') could also apply to outputs where researchers wish to protect their IP, with a view to creating a commercial venture, or where security issues arise. The decoupling of outputs from researchers should help with some of these, if the minimum output number were zero for these staff. Reluctance of academics and institutes to invest time in publications that are judged unsuitable for REF submission can also be an obstacle to collaboration.

However, some companies encourage the publication of collaborative work and cross-sector collaborative papers are often highly cited.

Some features of REF2014 could act as a barrier to collaborations across different sectors and within institutions. Collaborations across different sectors for example, can be hampered by differing priorities of organisations in different fields. Although the REF might seek to encourage collaborations between academics and research users through rewarding impact beyond academia, we hear that it can also hamper collaborations when the two sides cannot agree on a research question because some are driven by REF considerations and others are not.

Within sectors such as the livestock industry, collaborative outputs may prove difficult to capture in REF terms; this could reduce the promotion of these activities. For example, where the impact of research may have a multitude of benefits and impacts at several levels of society and across several nations

There has been some welcome for the idea of instigating a staff mobility metric, which may fall into the category of metrics assessing researcher activities, rather than of administration infrastructure. There are also notes of caution in relation to the potential for bias where the HEI and partner organisation may be located in close proximity; institutions that are remote should not be disadvantaged. Members have highlighted that a number of potential outputs (including participation in Innovate UK-funded projects, direct industry income, and involvement in KTPs) could be measured to further promote industrial collaboration. More prominence should be given to interactions with industry and other non-academic sectors, as well as, the public sector and appropriate non-government organisations.

Outputs

16. Do you agree with the proposal to allow the submission of a reserve output in cases where the publication of the preferred output will post-date the submission deadline?

Allowing reserve publications to be included is sensible, although if publication is defined by a doi, this is not an issue.

17. What are your comments in relation to the assessment of interdisciplinary research in REF 2021?

Recent analysis of the REF impact case studies showed that the majority were interdisciplinary; indicating its importance. However, topics which are naturally interdisciplinary can be penalised by the REF if they fall between different units of assessment, and the adjudicating panels do not have the full range of necessary expertise. Therefore, the same research could be assessed differently depending upon to which panel it is submitted (although this is an issue not specific to just interdisciplinary research). Assessment by more than one panel, which was executed in REF2014 addressed this. However, there should be mechanisms for those best equipped to comment on the importance and quality of the research to input. In line with this, judging panels need appropriate expertise available to assess interdisciplinary research, in combination with a very good understanding of the breadth of types of interdisciplinary research and collaboration. Such expertise could be enlisted through interdisciplinary 'champions' (a member of the panel with suitable relevant experience) as suggested in paragraph 72 a) of the HEFCE proposal for REF2021.

As much as interdisciplinarity should be encouraged, like collaboration it must not be an end in itself but must present the most fruitful means to approaching a research problem.

18. Do you agree with the proposal for using quantitative data to inform the assessment of outputs, where considered appropriate for the discipline? If you agree, have you any suggestions for data that could be provided to the panels at output and aggregate level?

Quantitative indicators (metrics) can assist and streamline parts of the REF assessment process, and although peer review is imperfect and resource-intensive indicators alone cannot provide a satisfactory assessment of the quality and impact of research. The Society supports peer review.

The use of quantitative indicators is especially prone to 'gaming', as indicators can become targets when more attention is paid to the measurement of the output than its inherent quality. Well-crafted rules and criteria, based on the lessons learned in the past REF, could limit the extent of gaming.

To aggregate information at an institutional level risks losing potentially useful granular information on areas of achievement in non-research-intensive institutions, and this could exacerbate what is perceived to be an already high concentration of research in a small number of institutions. Moreover, aggregating data over very dissimilar UOAs would be difficult and not necessarily helpful. Therefore, an approach that considers research quality at the individual level is preferred.

Transparency, clarity and good communication are essential to ensure trust in the assessment process and its outputs, and to prevent excessive drain of resources, as institutions prepare for, and inevitably try to second guess, the assessment.

Journal impact factor (IF) is still wrongly perceived as a defining metric with an important role in the assessment of research outputs in the REF, and it is widely used within institutions to choose which researchers to submit and to select their key papers; this may adversely affect careers. The higher IF

routes available to particular disciplines (e.g. biomedicine versus environmental taxonomy) can distort institutional investment priorities as well as individual career choices in anticipation of assessment under these criteria. Improved communication is needed to ensure that misperception is corrected and the use of IF as a proxy for research quality is strongly discouraged throughout the whole process of selecting outputs for REF submission. Despite instructions there is belief among researchers that IF is still used in REF assessment.

In measuring the quality of research outputs, a more sophisticated use of citation data would be valuable in many areas of the life sciences (although not uniformly and requiring field-specific treatment). Citation data adjusted to take into account the different citation practices of each field and its specific context, known biases, and the time since the research was published, could be used to assist the process of peer review by providing useful contextual information. However, citations should not be used automatically as a measure of research quality, as other factors also influence citation patterns, for example when papers are cited in order to criticise invalid conclusions.

Publishing members consider that the use of quantitative data as one component of assessment seems reasonable. They also add the caveat that care should be taken that metrics are appropriate and, insofar as is possible, relate to the specific work being assessed rather than being aggregate metrics. Article-level metrics (ALMs) and some alternative metrics offer a better approach to reflecting individual research outputs. However, some thought would be required to determine field 'averages' for comparison purposes. In addition to better reflecting individual outputs, using ALMs rather than citation alone has also been noted to allow better recognition of 'impact' in fields or types of work where citation is traditionally lower. This includes research with significant readership or impact in industry, or in sensitive areas such as defence, where research does not give rise to publications at the same rate as in traditional academic settings. It is also suggested that using ALMs allows better recognition of research outputs with significant impact on teaching and learning, where the primary target audience is students who will read and use the work but would not be expected to publish and cite it.

Impact

19. Do you agree with the proposal to maintain consistency where possible with the REF 2014 impact assessment process?

We broadly agree.

20. What comments do you have on the recommendation to broaden and deepen the definition of impact?

Overall, life sciences academic community expresses good understanding of the many forms that impact can take, and the proposed criteria are broad and flexible. There is concern that a prescriptive definition of impact could act against fundamental (so-called blue skies) research, which by its nature is less focused on immediate impact than more applied research. We recognise that a loose definition of impact does not allow for easy comparison across and between. However, the variation in impact dependant on the field of research could be accounted for, perhaps through submission guidelines and case studies.

A narrow focus on impact, particularly focused on commercial applications could encourage a culture of short-termism, with less immediately commercialisable research being neglected. Many commercial users of research see the initiation and maintenance of collaborative engagement, 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. Therefore, these deserve attention so as not to be lost between the

measure of impact and that of the research environment. In addition, economic impact can be via avoided costs, or reduced price of already available products and services.

A focus on international excellence as the highest accolade is not always appropriate and may not encourage focus on local impact and engagement. The impact of university research teams on local industry should be recognised and encouraged. This impact is often achieved through collaborations (see below) and flow of trained people.

21. Do you agree with the proposal for the funding bodies and Research Councils UK to align their definition of academic and wider impact?

The impact statements now required for Research Council funded projects are helpful. Both forms of proposed impact could be profound for very small or niche areas or number of people; the scholarship involved in achieving this should be recognised however. Collecting all outputs and evidence relating to non-academic impact into one category is not universally supported.

22. What comments do you have on the criteria of reach and significance?

Appropriate case studies are perhaps the best way of communicating these criteria; some flexibility of interpretation will be appropriate.

23. What do you think about having further guidance for public engagement impacts and what do you think would be helpful?

More guidance would be helpful but this must factor in the question of timing: the time it takes for impact to be made and, more importantly, the time it takes for thorough and validated assessment of that impact to be made.

There is increasing focus on local, person-to-person, public engagement rather than relying on large-scale or media based dissemination, communication or engagement. Trends and associated measures of success would have to be accommodated over the time of the REF assessment period.

It will be important to ensuring relevant sub-panel expertise is available.

24. Do you agree with the proposal that impacts should remain eligible for submission by the institution or institutions in which the underpinning research has been conducted?

Many members agree with this proposal, as this incentivizes appropriate investment in the broader infrastructure which facilitates impact delivery, including liaison staff, facilities and tech transfer offices. It will also be important to capture and reward any further development work and contribution to impact by another institution.

25. Do you agree that the approach to supporting and enabling impact should be captured as an explicit section of the environment element of the assessment?

We broadly agree that supporting impact can be seen as a cultural, or institutional characteristic; suitable to capture in environment. Capacity and ability to support individual impacts may not fully reflect the ethos overall; assessing approach is a reasonable accommodation.

26. What comments do you have on the suggested approaches to determining the required number of case studies? Are there alternative approaches that merit consideration?

We recognise the desire to broadly hold case studies to the previous volume. A formula could be proposed whereby case study numbers required could be calculated proportionate to the amount of funding a given HEI has received, in so doing case study numbers would be tied to both funding and staff deliverables.

27. Do you agree with the proposal to include a number of mandatory fields in the impact case study template to support the assessment and audit process better (paragraph 96)?

Mandatory fields could provide useful metadata for analysis.

28. What comments do you have on the inclusion of further optional fields in the impact case study template?

Recent analysis of the REF impact case studies showed that the majority were interdisciplinary, highlighting the importance of interdisciplinary research. Ability to note this and identify contributing disciplines in interdisciplinary case studies could be helpful.

29. What comments do you have in relation to the inclusion of examples of impact arising from research activity and bodies of work, as well as from specific research outputs?

We agree but there should be clear indications of the relevant underpinning elements (activities, outputs, etc) linked to the outcomes. Attempts should be made to capture any and all examples of situations where funding made available to HEIs has enabled impact delivery.

30. Do you agree with the proposed timeframe for the underpinning research activity (1 January 2000 - 31 December 2020)?

We think that this is broadly appropriate and reflects some areas where attempts have been made to measure path to impact, for example in biomedical science.

31. What are your views on the suggestion that the threshold criterion for underpinning research, research activity or a body of work should be based on standards of rigour? Do you have suggestions for how rigour could be assessed?

To be accepted for publication in reputable journals, authors are required to communicate that their work has been properly carried out. For application and use to occur, reproducibility of research is needed and this in itself provides an indication of rigour of the underlying research. Additional measurement retrospectively is not straightforward. There are some initiatives looking at pre-registration as a way to enhance transparency and reproducibility of research outputs, for example at the Centre for Open Science, but this is field-dependent and works only as a precursor to carrying out research studies. Case study assessments may provide a further route to the assessment of rigour; whereby the link between rigorous research and meaningful impact (both in terms of the individual project or initiative and in terms of maintaining the standards and profile of the UK research environment) can also be made.

32a. The suggestion to provide audit evidence to the panels?

Assessment of impact will be nuanced; peer review will be essential. However, we are aware of some support within the life sciences academic community for considering the use of quantitative indicators (metrics) to assist and streamline parts of the REF assessment process. It would therefore be impossible to include impact in an eventual assessment exercise based on metrics only, but in combination with the peer review analysis.

Moreover there is a risk that introducing the use of quantitative indicators to simplify assessment can lead to the temptation to use as few as possible, as has happened in other sectors such as secondary education. This should be resisted in order to preserve the richness of information currently captured by the REF.

32b. The development of guidelines for the use and standard of quantitative data as evidence for impact?

33c. Do you have any other comments on evidencing impacts in REF 2021?

The RSB did not provide answer to this question

33. What are your views on the issues and rules around submitting examples of impact in REF 2021 that were returned in REF 2014?

If significant additional development has occurred or assessment of impact can be made, we see no barrier to this. In particular, where an ongoing project has realised long term impact since the submission of returns to REF2014, we have received suggestions that this should be included (e.g. ongoing contribution to drug discovery projects in industry that have since delivered drugs to market).

Environment

34a. Do you agree with the proposal to change the structure of the environment template by introducing more quantitative data into this aspect of the assessment?

Quantitative data will add information, but without the peer review element it will be of limited value. Some members feel major advantages of a template are in increasing transparency, uniformity and clarity in the information required and provided, and to reduce subjectivity

34b. Do you have suggestions of data already held by institutions that would provide panels with a valuable insight into the research environment?

The new Athena Swan processes will include 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 Integration (E,D & I).

It has been suggested that there should be specific support for areas of research that can be proved to be under development within the university. This could be achieved for example though a field in the

environment section for grading for developing areas, as for impact cases. Some members welcome the suggestion to recognise institutional processes and responsible research such as support of the ARRIVE guidelines, 3Rs and relevant Concordats.

We would hope to see the environment section not only noting adherence to current good practice, and the adoption of many of the items mentioned above as community norms, but also to put forward the leadership and innovation in improved environment being undertaken, or already achieved. In addition, additional infrastructure investments, such as hosting biobanks, and national or joint facilities would be valuable as these may not be recognised elsewhere.

35. Do you have any comment on the ways in which the environment element can give more recognition to universities' collaboration beyond higher education?

As in other areas, up-skilling academic researchers in entrepreneurial skills and commercial sense, as well as industry processes and legalities will help. 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. 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 incentivised.

36. Do you agree with the proposals for providing additional credit to units for open access?

Open access (OA) development is complex. There are multiple pressures operating in the system and a range of valid considerations. Overall, increasing accessibility of the literature is to be encouraged (both push and pull incentives are valid) and there are particular drivers for this in relation to publicly funded literature. REF guidelines have been developed and communicated. In relation to the environment section, again adherence to expected practice should be expected noted but consideration of additional measures could be recorded, for example accommodation of Text and Data Mining under appropriate conditions, appropriate re-use licensing, repository management etc. We have heard concerns that adding credit for an aspect of the output of research that does not relate to its quality or impact, but rather to the business model associated with the way in which it is shared, risks diluting the focus of the REF. In addition the intertwined issues of the impetus to seek commercial impact where appropriate, and to disseminate as widely as possible mean that choice of copyright licence is key. Given the development of the industrial strategy and the ongoing monitoring of the transition to OA by the UUK group, having regard to author requirements remains an important consideration. At present the transition to open access is an ongoing process, it appears to be premature to consider including a measure of this sort in the assessment of research excellence.

37. What comments do you have on ways to incentivise units to share and manage their research data more effectively?

Encouraging units to ensure that data underpinning research outputs are open and accessible is desirable, however, at this point in the evolution of Open Data there are several questions which are as yet unanswered around which data are useful (big data including everything, or usable 'medium-sized' data); how data can be stored in a usable and searchable format; and how the costs of this will be met sustainably in the long term. A field-specific, international approach to data sharing is likely to be more successful and useful than institute-level repositories where providing the necessary level of discoverability for users will place a significant burden on institutional budgets and technology resources. Incentives which offer credit for records of research outputs, and which do not add significantly to the administrative burden on researchers or their institutions, should be considered; this would appear to be a broader question which would be best addressed outside of the setting of the current REF reward metrics REF.

However we recognise that there remain cultural barriers in some areas to data sharing where some researchers are reluctant to do so because publishing data is not incentivised through the REF, but re-using someone else's published data for secondary research is.

Current incentives for academic researchers put a strong focus on publications. Further incentives, closely based on the value of research in policy creation and real-world application, should be presented to the research community.

Institutional level assessment

38. What are your views on the introduction of institutional level assessment of impact and environment?

Many aspects of environment operate at the institutional level. Some members feel that consideration of aspects at the institutional level is a good idea, as it avoids duplication of information on central services. However UoA-specific information is also required.

It has been suggested that there should be specific support for areas of research that can be proved to be under development within a university.

39. Do you have any comments on the factors that should be considered when piloting an institutional level assessment?

Institutional support for research elements requiring infrastructure and long-term investment, highly relevant to bioscience, should be relevant here. In addition facilities to enable equipment sharing and overall cross-institutional efficiency in access to research facilities could be another factor to consider.

Outcomes and weighting

40. What comments do you have on the proposed approach to creating the overall quality profile for each submission?

41. Given the proposal that the weighting for outputs remain at 65 per cent, do you agree that the overall weighting for impact should remain at 20 per cent?

Overall we feel this is acceptable. Though it should be noted that assessment and weighting of impact in itself is of high importance in promoting the translation and communication of science.

42. Do you agree with the proposed split of the weightings between the institutional and submission level elements of impact and environment?

Training in core and research-wide aspects as well as institutional support for research-relevant Concordats on data sharing and researcher support could be considered. Encouragement at an institutional level for continuing professional development and career support, which may not be possible to deliver at departmental level, could be valid. In addition, institutional outreach and support of disciplinary and learned communities through engagement and facilitation of meetings, training, outreach and organisational facilitators (e.g. ORCID) would be valid. An overall weighting in Environment that favours institutional over unit reward may discourage innovation.

Proposed timetable for REF 2021

43. What comments do you have on the proposed timetable for REF 2021?

The timescale is reasonable and likely what the community was anticipating.

Other

44. Are there proposals not referred to above, or captured in your response so far, that you feel should be considered? If so, what are they and what is the rationale for their inclusion?

The publication of review papers is currently not encouraged by the REF. Although not every review can be counted as an excellent contribution to the body of existing scholarship, good quality reviews summarising, contextualising and distilling existing knowledge are especially valuable for new entrants in the fields and users of research such as those in industry and policy settings. Moreover, critical reviews can be very important in the development of a field, sometimes shifting research paradigms by interpreting existing knowledge in a new light. Good reviews require time and effort, and the REF submission criteria should allow for the recognition of these. However, some members feel that it is much more difficult, and more unusual, for a review to provide a significant advance in a field. Where this occurs, the output would/should be rated highly but this may apply more to perspective or commentary type articles than reviews.

Publications reporting negative results, or validating studies to examine reproducibility could be encouraged in guidance by the REF. Reporting such studies rarely commands space in high-profile journals and may not be viewed by institutions as REF returnable unless encouraged. Such encouragement would have the effect of encouraging researchers to spend time writing up these studies, currently there is little incentive for this.

As a final point of importance, it is key that changes to staff contracts should not be used to 'game' REF submissions.