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Research Excellence Framework 2021: REF Director's report

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1. Introduction

1. The Research Excellence Framework (REF) is the system for assessing the quality of research in UK higher education institutions (HEIs). The REF is undertaken by the four UK higher education funding bodies: Research England, the Scottish Funding Council (SFC), the Higher Education Funding Council for Wales (HEFCW), and the Department for the Economy, Northern Ireland (DfE). It is a process of expert review, carried out by expert panels for each of 34 subject-based units of assessment (UOAs).¹
2. REF 2021 was delivered by the REF team, based at Research England, on behalf of the four funding bodies. This report provides the REF Director's review of the operational delivery of the exercise by the REF team, across the period from its inception in 2017 until its completion in 2022. Drawing on our experiences of delivering the exercise, key recommendations for future are included as relevant. However, it is worth noting that many of these would only be applicable in an exercise that was run on a similar basis to REF 2021. Development work on a future iteration of the exercise has commenced as part of the Future Research Assessment Programme.²
3. Throughout this report, comments are included on issues encountered by and feedback received from institutions, the panels and the panel secretariat, which are provided from the perspective of the REF team, drawing on survey or other evidence as applicable. Further reports describing in detail the work of the assessment and advisory panels, as well as the REF outcomes and submissions, are available on the REF website.³
4. REF 2021 drew on the framework in place for the first REF, conducted in 2014, with several significant changes to the assessment process that were introduced following an independent review of REF 2014.⁴ These changes are described in more detail throughout this report, but in brief included key changes to the way that staff and outputs were submitted by institutions. The changes made limit the

¹ A list of the 34 subject-based units of assessment is available at www.ref.ac.uk under 'Panels'.

² Further information on the Future Research Assessment Programme is available at <https://www.jisc.ac.uk/future-research-assessment-programme>

³ The REF website can be found at <https://www.ref.ac.uk/>

⁴ <https://www.gov.uk/government/publications/research-excellence-framework-review>

degree to which comparisons can be drawn in the outcomes between REF 2014 and REF 2021; however, the REF team for 2021 drew substantially on the timetable and processes in place for delivering the previous exercise, which is referenced as relevant throughout this report alongside recommendations for improvements that could be made in a future exercise.

5. One of the most significant factors affecting the delivery of REF 2021 was the emergence of the COVID-19 pandemic in early 2020. The effects of COVID-19 on participating institutions impacted the final, key stages of the submission preparation process, with the original submission deadline set in November 2020. The REF process was put on hold for four months and, to support institutions in completing submissions during this period, the funding bodies agreed a set of revisions to the exercise, including a changing the submission deadline to March 2021. The effects of the pandemic also had a significant impact on the delivery of the assessment by the panels, with changes seen to the assessment timetable and format of panel meetings. These effects are covered in depth as relevant throughout this report. However, it is important to note here that the successful completion of the exercise would not have been possible without the dedication given to this by institutions, the REF panel membership and secretariat and the REF team based at Research England in the face of considerable change and disruption.

6. This report is set out in a broadly chronological structure, starting with the background to and early development of the REF 2021 exercise, and the recruitment of the expert panels. After the initial decisions on the framework had been set out, the delivery of the exercise was arranged across three phases: criteria-setting, submissions and assessment. The report covers each of these phases in turn, with separate chapters focusing on the data verification and library aspects of the assessment phase. Final chapters cover the process of publishing the outcomes and managing the overall programme. Our review of the exercise across these chapters is set out in some detail; for the reader more interested in a summary view, key points and recommendations are included at the start of the report sections.



2. Policy development

Key points

- Evaluation evidence and the Independent Review of the REF (the 'Stern review') pointed to the key areas of staff and outputs to address, with the framework otherwise staying consistent with 2014.
- In December 2016, the four funding bodies launched a consultation on the REF; informed by the consultation process, in September 2017 the REF team published the 'Initial decisions on the Research Excellence Framework 2021', with specific areas identified for further consultation.
- In November 2017, the 'Decisions on staff and outputs' confirmed the final high-level arrangements for REF 2021, incorporating further feedback received.

2.1 Evaluation of REF 2014

7. The Research Excellence Framework (REF) was first conducted in 2014, following extensive development and consultation with the higher education (HE) sector and wider organisations with an interest in the use of research. The REF built on the well-developed assessment process established in the UK by the Research Assessment Exercise (RAE), and added several major new features, including the assessment of research impact.
8. In 2013 – the submissions preparation stage of REF 2014 – we began work to evaluate and draw conclusions to inform future assessment exercises. In view of the significant changes introduced into REF after the RAE, this was a comprehensive programme of evaluation activities, including an accountability review that sought to estimate of the total cost of the REF; a two-stage evaluation of the assessment of impact; a quantitative analysis of the volume of interdisciplinary research (IDR) returned in the exercise; and qualitative feedback from both participating institutions and the expert panels.⁵

⁵ Further details on the background to REF 2021 are available at www.ref.ac.uk under 'About the REF'.

9. In addition to these direct reviews of REF 2014, there were further policy inputs into our work on developing a future exercise. This included the wider review of the use of metrics in research assessment, which concluded in 2015 with publication of 'The Metric Tide' report, concluding that metrics were not sufficiently robust to replace peer review. Further evidence was provided through the publication of the impact case study database and resulting initial analysis of the body of published impact case studies. Finally, in March 2014, the new REF open access policy was announced that would require all journal articles and conference proceedings to be open access from April 2016.⁶
10. In 2015, evidence from across this range of inputs indicated support for continuity over radical change in a future exercise, with specific areas flagged as needing further thought. This included the approach to submitting staff, refining impact rules, the unit of assessment (UOA) structure, assessing interdisciplinary research, increasing the use of metrics in the research environment, and the relative weightings between the three elements (outputs, impact and environment).
11. Preliminary engagement with the HE sector began in summer 2015, with workshops focusing on the issues around staff selection and approaches to refining the assessment of impact. These were intended to inform wider consultation activity planned for the autumn. This was subsequently pushed back following a letter from the UK Universities and Science Minister to HEFCE in September 2015, seeking a delay to the REF consultation until after the spending review.
12. In November 2015, the boards (or equivalent) of the UK funding bodies began considering the detailed plans for consultation – these included proposals around decoupling staff from outputs, submitting all staff and refinements to impact and environment. In December 2015, the UK government announced an independent review of the REF, and requested a further delay to the planned consultation pending the outcomes of this review.

⁶ 'The Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management' (2015), available at <https://www.ukri.org/publications/review-of-metrics-in-research-assessment-and-management/>; impact analysis available at <https://webarchive.nationalarchives.gov.uk/ukgwa/20180103165848/http://www.hefce.ac.uk/> under 'Publications and reports'; and OA (HEFCE 2014/07) available at <https://webarchive.nationalarchives.gov.uk/ukgwa/20180405115212/http://www.hefce.ac.uk/pubs/year/2014/CL072014/>

2.2 Stern Review

13. The review of the REF was launched in December 2015 by the then UK Universities and Science Minister, Jo Johnson. It aimed at ensuring future university research funding was allocated more efficiently, offered greater rewards for excellent research and reduced the administrative burden on institutions. An independent steering group of academic experts was appointed to conduct the review, which was chaired by Lord Nicholas Stern.
14. The Independent Review of the REF (the 'Stern review') reported in July 2016 and included a number of recommendations setting out the principles that should shape future REF exercises. The review considered that a substantial reinvention of the REF would increase uncertainty, workload and burden at a challenging time for UK higher education. It agreed that the processes used to assess research excellence – including measures of output, impact and environment – are well understood by the community and have, broadly speaking, delivered well in their objective to improve quality.
15. The recommendations made in Lord Stern's review were intended to reduce the burden and any distortions associated with the REF process while maintaining and improving incentives for research excellence. Collectively, they set out a vision for a lower-burden exercise that incentivises longer-term, interdisciplinary and higher-risk research through key changes to the processes for returning staff and outputs. Central to this was the submission of all staff with significant responsibility for research, along with decoupling the link between staff and outputs, and ensuring due reward for investment through the non-portability of outputs. The recommendations also sought to broaden and deepen the understanding of impact in the REF, to introduce a new institutional-level assessment of environment and impact to capture and reward activity that takes place at that level, and to reduce aspects of duplication across the submitted material.
16. The Government's 2015 Higher Education Green Paper 'Fulfilling our potential: teaching excellence, social mobility and student choice' had committed to holding the next REF by 2021. To meet this timescale, Lord Stern's Independent Review recommended that the decisions arising from consultation should be published in the summer of 2017, with submissions to be made in 2020 and the assessment

phase to take place in 2021. In September 2016, the minister wrote to HEFCE, asking the council to work with the other funding bodies to take the consultation forward.

2.3 Designing the 2021 framework

17. In December 2016, the four funding bodies launched the 'Consultation on the second Research Excellence Framework'⁷, building on the evidence gathered through the evaluation and incorporating the recommendations of the Stern review. The consultation took as its basis the framework as implemented in 2014, and sought views on the proposed approach to implementing Stern, along with a number of detailed proposals informed by the evaluation work.
18. The consultation primarily related to proposals for changes to the way that staff and outputs were submitted, in an approach that would continue to meet the funding bodies' objective for the process to identify excellent research of all kinds, while addressing some of the key incentives embedded in Stern's recommended measures and responding to feedback on the primary issues and challenges identified in the 2014 submission process. Accordingly:
 - a. A proposal for all staff with a significant responsibility for research to be submitted was aimed at addressing concerns about the comparability of assessment outcomes in the previous staff selection model, as well as comments around the burdensome nature of selectivity, and its potential to be divisive.
 - b. To provide greater flexibility in the submission process, the consultation included a proposal for the return of outputs to be 'decoupled' from staff – moving away from a fixed number of outputs required per staff member, to a total requirement based on the volume of staff in the unit. This proposal was aimed at better enabling units to undertake a range of research activity, as well as minimising the need for arrangements to take account of individual staff circumstances.
 - c. The consultation sought views on the various issues involved in making outputs eligible for submission only by the institution where the output was 'demonstrably generated'. This was in accordance with Stern's recommendation

⁷ 'Consultation on the second Research Excellence Framework' (2016), available at <https://webarchive.nationalarchives.gov.uk/ukgwa/20180307165223/http://www.hefce.ac.uk/pubs/year/2016/201636/>

that sought to recognise comments raised on staff recruitment issues around the census date and address potential disincentives for investment seen in the previous model of output portability.

19. The consultation also sought views on a range of further details, including increasing representativeness in the recruitment of the expert panels; whether additional arrangements were required to further support interdisciplinary research activity and its assessment; on broadening and deepening the definition of impact; and the introduction of institutional-level assessment for impact and environment.
20. We received over 380 responses to the consultation. The proposals were set out over 44 questions – many of which were multi-part and open-ended. In total, the set of responses included over 1.3 million words. Within HEFCE, we adopted a team-based approach to analysis, using qualitative analysis software. This turned out to be a very resource-intensive process that produced analysis outcomes at a much more granular level than was in reality needed. We also encountered technical issues during the process, where analysis that had been produced was lost and had to be redone, as well as licensing issues around use of the software. These factors delayed delivery of the summary of responses.
21. The summary of consultation responses⁸ was published on the REF website in September 2017. As set out in correspondence with institutions at that stage, 'overall, responses were supportive of the vision of the REF outlined in the Stern review recommendations. In particular, there was overwhelming support for maintaining continuity of approach through an exercise based on peer review, informed by metrics where appropriate, and assessing outputs, impact and environment. Responses broadly welcomed proposals aimed at increasing institutions' flexibility in building submissions, and at moving the focus of the exercise more from the individual to the institution; but were also keen to underline the importance of measures to promote equality and diversity in doing so. The sector also welcomed the increased focus on interdisciplinary research, and the proposals aimed at deepening and broadening impact in the REF.'
22. There were questions and concerns raised around some aspects of the proposals, including a lack of clarity around the proposals for assessing impact at the

⁸ 'Consultation on the Second Research Excellence Framework: Summary of responses' (2017), available at www.ref.ac.uk under 'Publications and reports'.

institutional-level, and the detailed mechanisms proposed in relation to staff submission – although the principle of all-staff submission was broadly accepted – and output portability.

23. Informed by the consultation process, in September 2017 the REF team on behalf of the four funding bodies published the 'Initial decisions on the Research Excellence Framework 2021' (REF 2017/01)⁹, accompanied by a circular letter from each funding body, setting out more detail about remaining areas for further engagement. The letter also confirmed a decision to increase the weighting of the impact element to 25%, in recognition of the importance of REF-driven funding in supporting the UK government's industrial strategy and in line with the funding bodies' original intention to increase the weighting of impact after the first run of assessment in 2014.
24. The initial decisions set out the general features of the exercise, which remained consistent with the 2014 framework, including the assessment of outputs, impact and environment on the basis of expert review (informed by metrics, as appropriate), and undertaken by an expert sub-panel for each UOA working within the guidance of four main panels. The decisions also confirmed details in relation to interdisciplinary research, impact, the UOA structure and panel recruitment. Informed by responses to the consultation, the decisions confirmed the inclusion of institutional-level information about the environment for sub-panel review, and also a pilot of its standalone assessment to inform inclusion as a discrete element in future exercises. Activity in relation to an institutional-level assessment of impact would be undertaken separately to the REF 2021 exercise, the decisions confirmed.
25. In two specific areas, responses identified the need for further discussion and evidence:
- a. A majority of respondents raised issues with the proposal to use contract data as reported to the Higher Education Statistics Agency (HESA) as the basis for determining staff with significant responsibility for research. This related to the wide set of responsibilities held by many staff employed on 'teaching and research' contracts. While in many research-intensive institutions, these data would fairly accurately reflect those employed with research responsibilities, in many other institutions respondents identified that staff often had more

⁹ 'Initial Decisions on the Research Excellence Framework 2021' (2017), available at www.ref.ac.uk under 'Publications and reports'.

significant responsibility for activities including knowledge exchange, professional practice, and scholarship. The funding bodies recognised that there would be no alternative, single indicator that could be consistently used to determine significant responsibility for research, so we needed more evidence to inform a detailed approach for identifying such staff through a designated process.

- b. Consultation respondents raised a range of concerns about output non-portability, including the potential effects of this policy on staff mobility (particularly for early-career researchers) and publication practice, as well as concerns about practical implementation and retrospective application given that we were already some way in to the assessment period. These concerns were well-grounded and indicated the need to run a transitional model for the 2021 exercise. We therefore sought views on a detailed approach for implementing this.

26. Proposals and questions for consultation were presented through webinars with the sector, and responses on these points were requested in the early autumn of 2017.

27. In November 2017, the funding bodies set out the 'Decisions on staff and outputs' (REF 2017/04)¹⁰, which confirmed the final high-level arrangements for REF 2021, incorporating the further feedback received. These decisions also confirmed the number of case studies required, the eligibility of institutions to participate in the REF, and further details about the UOA structure.

28. In January 2018, we held three 'town hall' meetings across the UK to present the outcomes of the consultation on REF 2021 and provide details on the decisions that had been taken on a number of high-level aspects of the framework. Information was also provided on the timeframe for the development of further guidance.

¹⁰ 'Decisions on staff and outputs' (2017), available at www.ref.ac.uk under 'Publications and reports'.



3. Units of assessment and panels

3.1 Units of assessment

Key points

- We proposed continuity overall with the UOA structure in REF 2014 and sought views on a few specific issues during consultation; responses showed broad support for overall continuity.
- The UOA structure continued to operate effectively and support consistency in the assessment process. In general, there remained some imbalance across the exercise in terms of the workload and scale of the UOAs.
- Institutions could request sub-profiles for outputs for discrete areas within a submission in UOA 12 (Engineering) and UOA 3 (Allied Health Professions, Dentistry, Nursing and Pharmacy); a relatively low proportion of submissions took this option up.
- Across the exercise, the expert panels observed more instances where outputs completely outside the remit of the UOA had been included within submissions than was felt to be the case in REF 2014.

Recommendations

- The value of providing output sub-profiles for discrete areas within submissions confidentially to the head of the institution should be explored with the sector, in view of its limited take up in 2021.
- The output tags added for criminology and forensic science were used inconsistently and could not be drawn on to produce robust analyses. Alternative approaches to enhancing visibility for these areas should be explored.
- There remains some imbalance across the exercise in terms of the workload and scale of the UOAs; yet there remains a minimum size in terms of membership for an effective sub-panel. These are issues that the funding bodies will want to consider in setting up the next exercise.
- Guidance should be reviewed on the submission of material that is out of scope of the UOA in which it is submitted, to ensure it can effectively meet the funding bodies aims for the assessment.

29. The revised Unit of Assessment (UOA) structure in REF 2014 introduced fewer, broader UOAs. This facilitated a more consistent assessment approach to be adopted across the sub-panels. During the evaluation process for REF 2014, we identified that some of the revised UOAs delivered a range of strategic and administrative benefits for submitting institutions and advantages for the panels during the assessment. In a small number of areas, issues were identified with the

revised structure including reduced visibility of individual disciplines and disciplinary differences in panel working methods.

30. In view of these broad findings, the 2016 consultation on the second REF proposed continuity overall with the UOA structure and sought views in general terms on the specific issues that had been raised with us about the structure last time. This included the engineering sub-panels, the combination of geography, environmental studies and archaeology in a single UOA, and arrangements for the submission of criminological, forensic science and film and screen studies research.
31. Responses to the consultation showed broad support for overall continuity. There was a mix of views received on the specific issues that indicated the need for us to explore these more closely with the relevant subject communities. In these further discussions, we sought to address the particular issues raised with the previous structure, in the context of the clear support expressed for maintaining consistency with the 2014 structure, and in accordance with our aim to:
- a. support consistency across the panels
 - b. encourage the submission of interdisciplinary research
 - c. minimise the fluidity between the UOA boundaries
 - d. give regard to the distribution of the workload across the panels.

3.1.1. Further engagement work

32. We explored the specific issues through a range of approaches during mid-2017, as appropriate to the nature of the issue.

Engineering

33. The consultation on the second REF identified 'an inconsistency of approach across institutions submitting to the four UOAs covering the engineering disciplines, which affected the comparability of outcomes in some areas and distributed workloads unevenly across the engineering sub-panels' (paragraph 26). This was due to the structure including both subject specific UOAs as well as a 'general engineering' UOA.
34. There was a mix of views received in consultation responses, with some advocating for continuation of the UOA structure for engineering, with slightly more advocating for change. Of these, revision into a single UOA was the most common suggestion. Key themes emerging from responses centred around the following concerns: that the UOA structure should enable meaningful visibility of

the discrete areas within engineering; the structure should enable the submission of general engineering approaches within institutions; the structure should support the assessment of interdisciplinary research. Respondents also raised the importance of consistency in assessment across the engineering sub-panels.

35. To explore the issue and work towards a consensus view in the subject community, the Royal Academy of Engineering hosted a workshop in June 2017, attended by representatives from university engineering departments across the UK. No clear consensus emerged from the workshop. A number of attendees expressed support for creating a single UOA (where discrete output sub-profiles were available for different discipline areas) as the best option for addressing the issues raised, and appropriately reflecting the dynamic and evolving nature of engineering in the UK. Some remained in favour of retaining multiple UOAs, with key concerns raised about the viability of the panel size of a merged UOA, visibility of disciplines, and around any effect on outcomes resulting from a merged UOA. Proponents of this approach, however, also suggested amendments would be needed to the 2014 structure (to accommodate, for example, bioengineering, energy / environmental engineering).
36. Based upon the discussions and evidence gathered through this further engagement, the funding bodies agreed that a single engineering UOA with the option to receive more granular outcomes (either across all elements, or for outputs alone, following discussion with the sub-panel for 2021) would best address the key themes articulated on the engineering structure and meet the funding bodies' aims for the UOA structure overall.

Geography, Environmental Studies and Archaeology

37. In the panel overview report produced at the end of the assessment in REF 2014, Sub-panel 17 had raised specific concerns about the structure of its UOA. Of those commenting in the consultation, the majority supported separation of this UOA, due to the reduced visibility for Archaeology. To explore this issue further in the context of the above outlined principles, we met with representatives from the relevant subject bodies (Royal Geographical Society, Royal Scottish Geographical Society, University Archaeology UK and the Chartered Society of Forensic Sciences) and former panellists from Sub-panel 17 to review the concerns and consider potential options. This included situating Archaeology elsewhere within the UOA structure or looking at potential new UOA – including possible coherence with forensic science. Representatives at the meeting agreed that the issues identified with the 2014 structure from the Archaeology community were unlikely to be fully

addressed by retaining the 2014 UOA structure or merging Archaeology with another REF 2014 UOA. The key issue identified was the need for greater visibility of outcomes from the REF.

38. We undertook further consultation with the relevant subject communities on possible approaches. The arguments outlined in some responses to this further engagement activity indicated that visibility might not be achieved through the proposal to create an Archaeology and Forensic Science UOA. There was also limited evidence available to indicate the size or likely submission approach of submissions into a Forensic Science UOA.
39. Taking into account this further evidence, the funding bodies agreed that the concerns about greater visibility raised by both the archaeology and forensic science communities would be best addressed by establishing a UOA for Archaeology, and by exploring approaches for Forensic Science-focused research outputs to be identified in the submission process.

Communication, Cultural and Media Studies, Library and Information Management

40. A small number of comments were received during the consultation with respect to this 2014 UOA. As the consultation summary reports: 'Comments focused on the distinctiveness of both 'Communication, Cultural and Media Studies' and 'Library and Information Management', with the balance of opinion in favour of reviewing this UOA' (paragraph 164.e).
41. We therefore convened a meeting to review the issues with representatives from the relevant subject groups (the Media, Communication and Cultural Studies Association, the United Kingdom Academy for Information Systems and the Forum for Archives & Records Management Education and Research), which included the former chair of Sub-panel 36. While the issues related to the distinctiveness of the fields within this UOA were outlined by representatives at the meeting, no clear alternative preferred option could be identified. There was recognition of areas of overlap between Library and Information Management and other UOAs, including Business and Management. However, this UOA was not considered to be a preferred alternative to UOA 36 by the communities represented. It was felt important to underline the distinct nature of the two fields reflected in the UOA, where the structure remained unchanged. There was also a concern to ensure the descriptor and panel expertise appropriately accounted for growth in research in the digital humanities.

42. Informed by this further engagement and in line with the above-stated aims for the UOA structure, the funding bodies agreed to maintain consistency in this UOA in REF 2021.

Film and screen studies

43. Feedback we received on the 2014 structure had indicated the need to include film and screen studies explicitly within the name of a UOA. We therefore sought views on a defined set of options from the relevant subject groups – the British Association of Film, Television and Screen Studies, the Media, Communication and Cultural Studies Association, the Standing Conference of University Drama Departments (UK) and the Theatre and Performance Research Association, the Council for Higher Education for Art and Design and the Society of Animation Studies. Responses broadly supported inclusion in a UOA name in the form 'Film and Screen Studies', and location in UOA 35 (Music, Drama, Dance and Performing Arts) where a revision to UOA 36 (Communication, Cultural and Media Studies, Library and Information Management) did not take place. There were clear views expressed that its location in a UOA name should not preclude its submission elsewhere.
44. In view of the decision taken to retain a single UOA for Communication, Cultural and Media Studies, Library and Information Management, the funding bodies agreed the extension of (what was) UOA 35's name to incorporate film and screen studies.

3.1.2. Finalising the UOA structure

45. The decisions taken by the funding bodies on each of the issues above were set out in the 'Initial decisions' document, published in September 2017. We also set out that discussions would continue with the subject communities for criminology and forensic science in relation to increasing visibility for these areas. These discussions took place in the early autumn and arrangements were confirmed in November in the 'Decisions on staff and outputs'. The arrangements sought to support the continued submission of these areas of research in the most appropriate UOA.
46. During our work with the expert panels to develop the detailed guidance and criteria, some further details were confirmed in relation to where multiple submissions would be permitted and where institutions could request sub-profiles

for outputs for discrete areas within a submission, to be provided in confidence to the head of the institution.

47. UOA 12 (Engineering) was one of the two UOAs in which discrete area sub-profiles could be requested, in recognition of the case made for retaining the more granular level of outcomes provided by the multiple engineering UOAs in the previous exercise. The sub-panel set out that institutions wishing to receive sub-profiles for distinct area should tag submitted outputs against the following areas, as applicable: Aeronautical, Mechanical and Manufacturing Engineering; Bio-engineering; Civil and Construction Engineering; Chemical Engineering; Electrical and Electronic Engineering; General Engineering; Metallurgy and Materials. In the event, this provision was requested by 34 out of 88 submissions into UOA 12, of which sub-profiles for 30 submissions could be provided – with the remainder being linked to too few members of staff (less than 5 FTE) associated with the tagged outputs. Towards the end of the assessment process, the sub-panel reflected more widely on the single-UOA structure for engineering. There was broad support expressed for a single UOA due to benefits of clarity, consistency in the assessment and supporting multi-disciplinary nature of engineering. The panel also noted the need to have effective processes in place to ensure feasibility, highlighting that a new, short taxonomy would be a key part in supporting this in a future exercise, rather than the more extensive list included in the UOA descriptor.
48. Discrete area sub-profiles could also be requested in UOA 3 (Allied Health Professions, Dentistry, Nursing and Pharmacy), in recognition that institutions may wish to receive outcomes for discrete areas of outputs within their submissions. Accordingly, outputs could be tagged against the following areas: Nursing, Dentistry, Pharmacy, Allied Health Professions and Biomedical Sciences. In UOA 3, 24 out of 89 submissions requested discrete sub-profiles, of which sub-profiles for 21 submissions could be provided, with the remainder again linked to too few staff associated with the tagged outputs. In view of the relatively low proportion of submissions for which the additional sub-profile data could be provided, it will be worth exploring the value of this provision with institutions in developing the criteria for a future exercise.
49. The arrangements in place for research in criminology and forensic science included a provision for institutions to 'tag' outputs that embodied research in each of these areas. Excluding those outputs marked as 'not for publication', the total number of outputs tagged in each area was 1,439 and 275 respectively. Feedback from the expert panels during the assessment process highlighted

inconsistency in the approach taken by submitting institutions to the use of these tags – in common with observations on the use of the interdisciplinary research tag (see paragraphs 180-184). These concerns about the reliability of the tagging data led the funding bodies to conclude that analysis of the overall quality of outputs in each of these areas, based on the tags, would not be robust. Output sub-profiles for these areas have not, therefore, been produced. Further engagement with the relevant subject communities may be needed in a future exercise, in order to explore alternative approaches to enhancing visibility of outcomes for research in these fields that are distributed across multiple UOAs.

50. More widely, the UOA structure was built substantively on the structure used in REF 2014, and this continued to operate effectively and support consistency in the assessment process. In general, there remains some imbalance across the exercise in terms of the workload and scale of the UOAs, with submitted staff FTE ranging from just under 450 FTE to over 7,500 FTE¹¹. Due to the changes to rules for submission of staff and outputs, some sub-panels also saw decreases in the volume of material submitted for assessment since 2014; yet there remains a minimum size for a sub-panel for it to effectively undertake the assessment process and carry the confidence of the community. These are issues that the funding bodies will want to consider in setting up the next exercise.

51. Across the exercise, the expert panels observed more instances where outputs completely outside the remit of the UOA had been included within submissions than was felt to be the case in REF 2014. Feedback in our end of exercise panel survey suggested some members felt their sub-panel needed to assess material they felt would have been more appropriately assessed elsewhere, with some querying the rationale for some submissions to their panel. Panels could make use of cross-referral to another sub-panel for advice where this was the case, although this added some complexity to the assessment process. While in many cases these outputs tended to be isolated examples within a submission, in a few instances they comprised a not insignificant proportion of the submission's outputs¹². This noted trend may have been a consequence of the move to an all-staff submission approach for REF 2021. Responsibility for mapping staff into UOAs lay with institutions in REF 2021, within the general requirement that the research carried

¹¹ Further data on staff FTE, number of outputs and case studies submitted by UOA are available in the main panel overview reports (at www.ref.ac.uk, under 'Publications and reports'). See also the 'UOA summary data', available at www.ref.ac.uk, under 'Results and submissions'.

¹² See the main panel overview reports for more detail on these specific instances, available at www.ref.ac.uk under 'Publications and reports'.

out in the unit related primarily to the areas of research set out in the UOA descriptor. Given some of the challenges encountered by the panels in approaching the assessment of these items, it would be beneficial to review the parameters of this guidance in accordance with the planned approach to submissions in a future exercise.

3.2 Expert panels

Key points:

- All appointments to the expert, advisory and pilot panels in REF 2021 were made on basis of an individual's experience, expertise, abilities and knowledge.
- Several measures were put in place to increase representativeness of the expert panels. Analysis showed key progress made in achieving this, but that there remains more to do to increase ethnic diversity on the panels in future.
- The recruitment of the main and sub-panel chairs by open application was successful in appointing a strong set of individuals to these key roles. The early appointment of the main panel chairs helped to develop strong and positive working relationships.
- We implemented a staged approach to the appointment of panel members. This allowed responsiveness in appointments throughout the exercise; however, the multiple points at which new members joined complicated processes around induction and integration.
- The nominations process in the later stages was impacted by COVID-19; however, it succeeded in the appointment of panels with appropriate expertise. Chairs felt the process did not work as well for impact assessors.
- The nomination form was onerous to complete for bodies nominating large numbers of individuals, so we developed a separate excel form for organisations nominating 20 or more individuals.
- Following the appointment processes, both the main and sub-panel chairs identified some challenges in making recommendations to funding bodies as sole advisers, with several noting that more input on selection decisions would be beneficial.

Recommendations:

- It would be beneficial to widen those involved in selecting sub-panel chairs; the funding bodies should consider whether earlier appointment of main panel deputy chairs would support this.
- It would also be beneficial to widen those involved in selecting sub-panel members, although there may be practical limitations to consider on the earlier appointment of sub-panel deputies.
- An automated approach to collecting large numbers of nominations from nominating bodies should be built into the process from the outset.
- A more efficient, delegated approach to approving new panel appointments should be introduced during the assessment year, to support the timely completion or replacement of membership.
- The staged approach to appointing the panels had pros and cons; the funding bodies should seek to balance responsiveness in appointing the membership with effective approaches to integration and induction.
- There remains more work to increase ethnic diversity on the REF panels in future. It will be important to increase understanding of under-representation in the nominee pool and identify ways to ensure inclusivity in the work of the panels.

Collection of data on protected characteristics should ensure alignment with best practice standards; the funding bodies should also consider collecting data on socio-economic status.

52. All appointments to the expert, advisory and pilot panels in REF 2021 were made on basis of an individual's experience, expertise, abilities and knowledge. The panels were appointed by the funding bodies, with the boards or equivalent of these bodies delegating approvals to the chief executives (or equivalent) at the outset of the exercise. Further on in the assessment year approval was delegated to senior officers in the funding bodies, to increase efficiency in the process of replacing panellists where necessary during the COVID-19 pandemic.

53. In September 2017 in the 'Initial decisions', we set out a number of measures across the different stages of panel recruitment to increase representation across REF panels. Our implementation of these measures and reflections on their success are set out in the following sections.

3.2.1 Appointment of panel chairs

54. The recruitment of the main panel chairs (designate) took place in spring 2017, after the consultation on the second REF closed. In the first instance, the role of the chairs designate was to advise the funding bodies on the initial decisions, and

on the further planning and development of the framework, before taking up their roles as main panel chairs later on that year.

55. In line with the process followed for REF 2014, the appointments were made via an open application and interview process, with clear criteria set out in the advertised materials. We expressly sought applications from individuals from diverse backgrounds, recognising that diversity of thought and experience contributes fundamental insight and value to the work of the REF panels, and that this insight and value comes not only from academic achievement but also from other aspects of panel members' lives. The chair of Equality and Diversity Advisory Panel (EDAP) was part of the selection panel for all four main panels to help ensure EDI was given full consideration. We collected equal opportunities monitoring data to allow us to review the diversity of the applicant pool; the data were not used to inform individual selection decisions.
56. We received a good range of applications for Main Panels A and B. The deadline for applications in Main Panels C and D was extended to ensure a sufficient candidate pool. 42 applications were received in total. The monitoring data showed an under-representation of females and individuals from Black or Asian backgrounds in the applicant pool, in comparison with the permanent academic population in the HESA staff record (2017/18). The data for disability indicated a slightly higher representation of those reporting a disability in the applicant pool, compared with the permanent academic population. In terms of institution type, the 'home institution' for over 70 per cent of applicants was affiliated with the Russell Group. The vast majority of applicants were based at institutions in England.
57. Endorsement letters were sought for shortlisted applicants from key subject or related bodies identified by the candidates. We established interview panels comprising senior leaders from the UK HE sector, who recommended candidates for appointment to the funding bodies. This process overall ensured a successful and strong set of appointments to the important role of main panel chair, with the appointments announced in July 2017.
58. The early appointment of the main panel chairs helped to develop strong and positive working relationships – both across the four main panel areas, and with the REF team, contributing substantially to the success of the exercise overall and ensuring increased consistency across the process where possible.

59. The sub-panel chairs were recruited through an open written application process. We advertised for the sub-panel chair positions when the 'Initial decisions' were published in September 2017. Sub-panel chairs were assessed against criteria set out in the published person specification. 169 applications were received in total, with a good number received across the majority of sub-panels by the deadline; this was extended for two sub-panels to ensure a sufficient pool of applicants. Letters of endorsement from subject associations or other organisations that demonstrated the individual's standing in the community were included, which were requested to indicate support from across the full breadth of disciplines covered by the UOA.
60. We again expressly sought applications from under-represented groups. Equal opportunities monitoring data were collected during the application process and were not used to inform individual selection decisions. The main panel chairs received tailored unconscious bias training prior to reviewing the sub-panel chair applications and making recommendations to the funding bodies. Applications were also reviewed by the REF director and chair of the REF steering group.
61. The appointments were made by the funding bodies after taking advice from the main panel chairs, and were announced in December 2017. The process was successful in appointing a strong set of individuals to these key roles. In terms of 'home institution', the 34 chairs came from institutions across the UK and showed diversity of institution type. Both of these aspects were broadly in line with the proportions observed in the applicant pool (with slightly higher appointments for Wales, Northern Ireland and GuildHE institutions). The appointed pool also showed an improvement in the representation of women in sub-panel chair roles, at 41 per cent up from 20 per cent in 2014, and slightly above the proportion observed in applicant pool.
62. In reflecting on the appointment process, the main panel chairs identified some challenges in making recommendations to funding bodies as sole advisers, supported by the REF director and chair of the steering group. One option for the funding bodies to consider is earlier appointment of the main panel deputy chair roles, in advance of the sub-panel chairs. This would widen the group making selection decisions.

3.2.2 Appointment of panels for the criteria phase (2018)

63. One of the key aims for the appointment of the expert panels was to increase representativeness, drawing on recommendations from the previous exercise's EDAP and informed by responses to the consultation on the second REF. A point we considered carefully was whether the process should continue to be via nominations, excluding self-nomination and by HEIs. In view of advice from the newly appointed EDAP and responses to the consultation, the 'Initial decisions' confirmed that the appointment of panel members would be via nominations, which would be invited from all bodies with an interest in research, excluding mission groups, individual HEIs (and groups within HEIs), and self-nominations. The document also set out a further range of measures seeking to increase panel representativeness, including bespoke training for those involved in selection decisions and new requirements on nominating bodies to set out considerations made in relation to equality and diversity in putting forward candidates. We implemented and refined these measures across the nomination stages for REF 2021.
64. We also consulted on, and confirmed in the 'Initial decisions', a new staged approach to the appointment of panel members in REF 2021. This aimed to build on the REF 2014 proposal to develop the guidance and panel criteria simultaneously through appointing only the main panels at the criteria-setting phase of the exercise. Clear arguments were put forward in consultation responses for appointing wider group than the main panels only (which include only the sub-panel chairs as representatives from each UOA). So, the 'Initial decisions' confirmed that a two-stage process would be followed for REF 2021, starting with small groups for each UOA for criteria-setting, and the appointment of the wider panel after institutions had completed a scheduled survey of their submission intentions, to ensure each sub-panel had the appropriate breadth and depth of expertise required for the anticipated submissions.
65. During consultation in 2017 and through the 'Initial decisions' document we worked on updating our list of nominating bodies and the contact information we held for them. We had over 2,000 bodies on the list. In many cases, this included a postal address only. We were keen to expand the number of email addresses we held for these bodies, to better support online communication with them. Nominating bodies did not need to be captured on the list to be eligible to nominate – nominations could be made by any association or organisation with an

interest in the conduct, quality, funding or use of research. However, inclusion on list supported our communication with nominating bodies during the process.

66. In October 2017 we published 'Roles and recruitment of the expert panels'¹³ (REF 2017/03), which set out the process for appointment and the detailed roles on the panels in more depth, and officially invited nominations for expert panel members. This included the new role of IDR adviser, who would have a specific role to advise on and participate in the assessment of interdisciplinary research submitted in that UOA, to ensure its equitable assessment. The role formed part of the new measures introduced to support the submission and assessment of interdisciplinary research. Further details on these measures are set out in paragraphs 174-178.
67. We wrote directly to the nominating bodies at this stage to invite nominations for individuals to take part in the REF. Nominations were also openly invited from any other organisations with an interest in research, except for mission groups or individual HEIs. An online nomination form was developed using a survey tool to collect details of each nominated individual and their expertise and experience. This form was onerous to complete for bodies nominating large numbers of individuals, so we developed a separate excel form for organisations nominating 20 or more individuals. This successfully supported the submission of larger numbers of nominations; however, it added more manual steps and some complexity to the processes for compiling nominations within the REF team. In a future process, the funding bodies should build into the process from the outset an automated approach for collating larger numbers of nominations.
68. As part of the new measures to increase the representativeness of the panels, nominating bodies were asked to complete a template detailing how equality and diversity considerations were taken into account in putting forward nominations. These templates were reviewed by EDAP (see section 0 for the establishment of EDAP), who produced a report later in the process summarising their findings and setting out recommendations for further nomination rounds¹⁴ (further detail on the assessment phase panel appointments process can be found at paragraph 71 onwards). We provided guidance to nominating bodies to inform their considerations about equality and diversity issues when following processes for

¹³ 'Roles and recruitment of the expert panels' (2017), available at www.ref.ac.uk under 'Publications and reports'.

¹⁴ 'Improving panel representativeness: Review of Nominating Bodies' Equality and Diversity Templates' (2019), available at www.ref.ac.uk under 'Publications and reports'.

nominating panel members and provided contextual data on the representation of protected groups among UK academic staff at that time. Equalities monitoring data were sought from all nominees, after the nominations had been received. These data were collected anonymously and were not used to inform individual selection decisions (see further information in paragraph 80). We also extended the tailored unconscious bias training to all sub-panel chairs in advance of their making recommendations for appointments.

69. The deadline for nominations closed in December 2017, and we received over 4,200 nominations from over 600 different nominating bodies. We provided the information to sub-panel chairs (and to the main panel chairs regarding the nominations for additional main panel members), for their first major task of considering the membership of each of their panels for the criteria phase. In general, we expected that candidates nominated to be members at this stage, but not appointed, would also be considered as potential members or assessors in the assessment phase, as well as seeking further nominations in 2020.
70. Chairs recommended the membership of each sub-panel according to the criteria for appointing panels (paragraph 64, REF 2017/03). Their primary concern was to select members who had appropriate expertise to contribute to the development of the criteria across the sub-panel's remit, and in almost all cases the pool of nominees provided sufficient choice. The REF team provided guidance to chairs, including on the funding bodies' aim to achieve a diverse membership across the REF panels that broadly reflected the research community. It also provided guidance on the anticipated number of members, which needed to be proportionate to the scale and diversity of the panel's remit. We provided a sliding scale of expected member numbers for both the current and full panel stages of appointment, based on the volume of FTE submitted in REF 2014 in each UOA.
71. Most chairs recommended panels near to or above the upper end of the sliding scales – particularly for the criteria phase appointment stage. A few chairs felt it was challenging to achieve the full breadth of expertise required within these size limits. In the event, the majority did start with a smaller criteria group, with most chairs also recommending at this initial stage the appointment of many of the members they wanted to join at assessment phase. This reflected some concerns expressed by chairs around ensuring availability, carrying the confidence of their communities through providing early visibility of the wider membership, and to minimise the occurrence of multiple conflicts of interest that may arise through late-appointed members having undertaken significant REF advisory roles with a

range of submitting institutions. The assessment phase members were appointed with a view to taking up their roles later in the exercise. Prior to putting forward their recommendations to the REF team, each sub-panel chair reviewed the proposals with their main panel chair. After these discussions the recommended membership of each panel was put forward to the funding bodies for approval, with appointments made and announced in March 2018. For a small number of sub-panels, insufficient nominations had been received for candidates with expertise in specific areas, so further targeted nominations were sought and further appointments made in May and July 2018. These were targeted by first identifying appropriate organisations and then inviting them to nominate individuals with specified expertise.

72. In common with the main panel chairs, the sub-panel chairs reported some challenges in reviewing nominations substantially as a sole reviewer, with several noting that more input on selection decisions would be beneficial. The funding bodies should consider how this could best be operationalised, noting that a further appointment round for deputy chairs may support this but would need to be carefully considered in terms of the overall timeframe for recruitment and additional administrative requirements on both the chairs and the REF team.
73. Alongside the recruitment of sub-panel members, we also sought nominations for additional main panel member roles, which included individuals with interdisciplinary expertise, with international expertise, or with expertise in the use, application and wider benefits of research. Over 250 nominations were received for these roles, although this included some duplication with the sub-panel set, with some of nominees put forward for both roles. Nominations were assessed by the main panel chairs against the requirements of the role, seeking to ensure an appropriate mix of research users, interdisciplinary and international members. The majority of these were identified from the nominations and appointed in February 2018. We did not receive a sufficient number of nominations for users and international members for some of the main panels. This is likely to reflect that these members are drawn from sectors beyond UK HE, meaning more tailored communications approaches might have been required to encourage interest. Further targeted nominations were sought and appointment by panel co-option was followed in two cases for international member roles.
74. This initial recruitment of members was completed within six months. Nominations had been invited in October 2017 and we were able to arrange the

first meetings of the main panels to take place in March 2018, followed by sub-panel meetings in April 2018, to input into the guidance and criteria.

75. We wrote to all nominees not appointed at this stage (either to take up roles immediately for the criteria-setting, or to join the panel later on in the exercise) to let them know the outcome and confirm whether or not they wished to remain in consideration for the next round of nominations scheduled in 2020. This enabled the REF team to maintain an updated list of nominees for the next round; however, we received some feedback the message could have been framed more positively in recognition of the staged approach to appointing the panels for REF 2021.
76. Following completion of the appointment process, we collected equal opportunities monitoring data from the appointed pool of members and undertook an analysis of the representativeness of the panel membership – in the context of the nominee pool, the previous exercise and wider comparator populations. The 'Analysis of REF 2021 panel membership' (REF 2019/07)¹⁵ was published in 2019 and showed key positive trends in some areas: the representation of females and individuals with declared disabilities on the appointed panels both had increased significantly since 2014. The analysis also highlighted areas where more limited progress had been made, including in the representation of individuals from Black, Asian or minority ethnic backgrounds, highlighting where specific further action was required in future nomination rounds. We also received some correspondence from subject communities within the areas covered by Main Panel C about under-representation on the appointed panels in terms of ethnic background. The REF team worked closely with EDAP to identify opportunities to broaden the nominee pool for the next nomination round, and sought input on this from sector groups, including UCU Equalities groups and at a workshop during the Leadership Foundation BME Summit.

3.2.3 Appointment of panels for the assessment phase

77. Across January and February 2020, the main and sub-panels met in person to prepare for the assessment phase. Where members had been appointed in 2018 as assessment phase members, they joined these panel meetings. At these meetings, the panels reviewed analysis of institutions' responses to the survey of submission intentions (see section 0) in order to identify the areas where further

¹⁵ 'Analysis of REF 2021 panel membership' (2019), available at www.ref.ac.uk under 'Publications and reports'.

appointments would be required, including any shared appointments across sub-panels. The sub-panel's identified requirements were reviewed and agreed by the main panel. The panels considered the need for:

- a. Further full sub-panel members, where the membership required to assess submissions needed to be expanded to ensure appropriate expertise in accordance with the anticipated volume of submissions.
- b. Additional interdisciplinary advisers, where data on anticipated IDR outputs in the survey indicated the need for further members with this role. Each sub-panel was requested to appoint a minimum of two IDR advisers.
- c. Output assessors (who are involved in the assessment of outputs only, including the development of the outputs sub-profile), where additional expertise was required to assess the range and volume of outputs indicated in the survey responses.
- d. Impact assessors (who are involved in the assessment of impact case studies, including the development of the impact sub-profile, and may be involved in assessing relevant sections of the environment template), where additional user expertise was required to assess the range of impacts indicated in the survey responses.
- e. Any anticipated requirements for specialist advisers, to provide advice only on outputs in languages that the panel is otherwise unable to assess. This could also include outputs with a substantial amount of code, notation or technical terminology analogous to another language.

78. Guidance was again provided to the sub-panels on the overall number of appointments expected. The survey data showed that all sub-panels were expecting an increase in the volume of staff expected to be submitted since REF 2014 – given the requirement to submit all staff with significant responsibility for research – but also that there was wide variation in whether this would result in an overall increase, decrease or no major change in the number of submissions, volume of outputs and number of impact case studies expected per sub-panel. A new sliding scale was provided, based on the expected volume of staff FTE from the survey to guide decisions. We also advised that where the intended volume of outputs/case studies was expected to decrease from the previous exercise, we would not expect to see an increase in the recommended number of panellists.

79. The requirements for additional appointments were agreed broadly within these figures, so that the overall number of appointments across each main panel area were balanced out. Some of the smaller panels still found they needed a minimum

spread of expertise, despite expecting overall decreases in the number of outputs and case studies.

80. The gaps identified on each sub-panel could be filled using existing nominations and/ or through the new round of nominations planned. The new round incorporated revisions to the process, following the EDAP report and analysis of panel representativeness. The revisions included:
- a. Updated appointment criteria.
 - b. Extending the tailored 'Fairness in REF' training across all those involved in selection decisions (and later across all panellists).
 - c. Widening the group that made recommendations for appointment to include the membership of the sub-panel executive groups (including the chair, deputy chair(s) and secretariat), with proposed recommendations still for discussion with main panel chairs.
 - d. Updating the equality briefing provided by EDAP to the expert panels, including an encouragement to sub-panels to be pro-active in communicating the call widely and being aware of inequity in the attainment of markers of seniority for under-represented groups
 - e. In specifying the areas of expertise each sub-panel was seeking further nominations for, they could also set out any particular areas of under-representation for which they were seeking more nominations.
 - f. We sought to clarify the guidance on nominations for nominating bodies, producing shorter, more accessible documentation.
 - g. The template for nominating bodies to report their equality and diversity considerations was updated, taking account of the key recommendations made by EDAP following their review of the templates submitted in the 2017 round; it also was made a requirement for a template to be provided in order for the nominations to be accepted.
81. We launched the call for nominations in February 2020, with a new online form and the updated guidance, including the specific areas of expertise each sub-panel was looking for. We also published the scheduled panel meeting dates for the assessment phase. We intended to close the call in April and confirm appointments soon thereafter.
82. In March 2020, the impact of COVID-19 delayed the nominations timetable (as well as the exercise more widely – see section 4.6 for more detail on COVID-19 effects). As we developed revisions to the wider REF timetable, we were able to confirm a new deadline for nominations in early September. We were also able to move

ahead with some appointments from the original nominee list in July 2020, where nominees had indicated willingness back in 2018 to remain under consideration. Nonetheless, this still required some liaison between the original nominees and REF team to confirm continued interest – which by and large there was.

83. In September 2020, the REF Steering Group also agreed to the appointment of additional assessors to the REF sub-panels. These were appointments additional to those already agreed following the early 2020 panel meeting. The additional appointments formed part of the COVID-19 mitigations that we developed, which sought to recognise the challenges in workload arising from the effects of the pandemic and resulting from the revised assessment schedule falling across a different period of the academic year, and aimed to mitigate risks around panel member illness or drop out. The arrangements were informed by survey of sub-panel chairs on support measures over summer 2020. Up to three additional assessors (either output, impact or both) could be appointed by the sub-panels, as determined by identified need. The recommendations were primarily included in the autumn round of appointments, although some sub-panels chose to wait until submissions were received so that they could fill remaining gaps responsively. We also increased the impact assessor fees, in response to increased concerns about recruiting members from beyond HE arising from the effects of COVID-19.
84. During the new nominations round we received around 1,000 nominations from approximately 230 nominating bodies and the majority of the remaining appointments were confirmed in October 2020. There remained challenges for some sub-panels in identifying individuals with suitable expertise, particularly for the role of impact assessor. Therefore, around a further 50 appointments were made in December 2020 and into early 2021 for the areas where these gaps remained. In a small number of cases, appointments at this stage were to replace existing members that had resigned, or where offered appointments were not accepted.
85. Some sub-panels had retained flexibility to appoint further members and assessors following receipt of the submissions, where analysis of submitted data would be able to provide a more accurate picture of expertise gaps remaining. As part of the arrangements in place to support the panels in response to COVID-19, we aimed to make the appointments process more efficient during the assessment phase itself, to ensure assessment capacity could be maintained in the event of any member withdrawals. We therefore requested from the chief executives (or equivalent) of the funding bodies delegated authority for approvals

to be given to senior staff within each funding body. This enabled a more responsive approach to be taken to the appointment of members during the assessment year, from March 2021. In total, a further 40 appointments were made in the period following the submission deadline to fill pre-existing gaps or replace withdrawals. While it would be appropriate for approval to remain with chief executives (or equivalent) for the main appointment stages in a future exercise, the funding bodies should consider building in from the outset the further delegation of appointment approvals in the assessment year to senior staff overseeing the operational delivery of the exercise.

86. The nominations process in this round had generated a good proportion of further candidates; however, the potential impact of the pandemic on the overall pool was felt in some areas, with increased challenges in appointing individuals beyond HE to impact assessor roles in particular. This necessitated greater use of co-option to fill remaining gaps – where a sub-panel knew of a suitable individual and recommended they be co-opted – than in the previous exercise. The majority of these were for impact assessors, with 22 approved prior to the new approvals process and a further nine impact assessor co-options approved from March 2021. Across both approval stages, 17 sub-panel members and seven output assessors were also co-opted.
87. At the final count of membership towards the end of the assessment year, the main and sub-panels comprised over 1,100 members and assessors, of which 900 were practising researchers from across 130 universities in the UK and worldwide, and 220 were research users.
88. When we surveyed the panels at the end of the exercise, we sought views from the sub-panel chairs on the nominations process. There were some views that this process provided a wide number of candidates, sometimes accompanied with the view that these candidates come with endorsement or carry the confidence of their subject communities. In some cases, chairs saw a key benefit in drawing on the more detailed knowledge of nominating bodies of their candidates. However, there was also a clear feeling that the process did not work as well for impact assessors, with insufficient nominations received. Some also felt that they did not get a representative pool in EDI terms, or to a lesser degree the right spread of expertise. Linked to these points was concern around getting sufficient nominations to balance all the criteria and ensure appropriate coverage against the anticipated workload. A few responses noted some variation in approach by nominating body. Chairs provided a range of suggestions and further points, the

most common of which was about needing to ensure a more diverse set of nominations in future. Suggestions on how further improvements can be made included earlier appointment of the chairs, combining nominations with targeted self-nominations later in process (where gaps are remaining), bringing in early career researchers, and increasing clarity in the processes – especially for the recruitment of impact assessors.

89. Overall, the nominations process succeeded in the appointment of panels with appropriate expertise. This is underlined by the survey of panels, with the vast majority of respondents agreeing that the composition had enabled the panels to assess the full scope of submissions. Reflecting feedback noted above (paragraph 51), some respondents noted that their panel had needed to assess material they felt would have been more appropriately assessed elsewhere. We had a small number of concerns raised about the membership when it was first announced in 2018, beyond those raising the concerns about EDI representation (covered above). These primarily related to concerns or suggestions about further discipline gaps, sometimes related to the small proportion of members appointed at the criteria phase. These concerns were largely addressed through further appointments – both of assessment phase members announced in 2018 or later on in the process, with the information on noted gaps reflected on by sub-panel chairs.
90. The staged approach to the appointment of the panels introduced both benefits and challenges into the process, although the impact of COVID-19 makes it difficult to evaluate the approach in isolation – particularly around the integration of members and assessors joining later on in the process, which needed to take place in a virtual context, and the difficulties in some areas in identifying sufficient impact assessors. The staged approach overall supported the appointment of panels with appropriate breadth in expertise and which could be responsive to the emergence of further areas through the survey of submission intentions. However, there ended up being multiple points at which new members joined, which complicated processes around induction.
91. When surveyed, responses from the sub-panel chairs identified two key benefits with the staged approach: firstly, its responsive nature, which allowed gaps to be filled, any issues with representation addressed, and the workload balanced across the membership appropriately; secondly, many found the small size of the group appointed for the criteria-setting phase to be effective in view of that task. The challenges identified were primarily around the integration of the new members,

particularly in the virtual setting, and some concern about less investment in or ownership of the criteria by those who joined later on. In some cases it was felt this affected the confidence of new members in getting up to speed. Responses from the wider membership were generally positive on the issue of integration of new members, sometimes noting efforts made by sub-panel executives (comprising the chair, deputy chair(s) and panel secretariat) to support this. Some respondents noted the greater challenge was presented by needing to achieve integration largely online.

92. In summary, it will be challenging to balance effectively taking forward the advantages of the staged approach with addressing some of the drawbacks. It will remain important to ensure the membership be built responsively in relation to information about the nature and range of submissions. It will also be crucial to ensure effective approaches and training are put in place to support the induction and integration of members appointed later on in the process.

93. In August 2021 we published the 'Analysis of full REF 2021 panel membership' (REF 2021/01)¹⁶, which updated the previous analysis to incorporate the updated membership as appointed in January 2021. The analysis showed that we had made progress in increasing the representativeness of individuals from Black, Asian and minority ethnic groups, with a statistically significant increase observed in the proportion of appointed members from these backgrounds since both the criteria phase round and the previous exercise. However, in contrast with other characteristics including sex and disability, the proportion of those from Black, Asian or minority ethnic backgrounds in both the appointed and nominated pools was lower than the proportion in the permanent academic population, and was broadly aligned with the proportion among the population of permanent professors. This indicates that there remains more to do to increase ethnic diversity on the panels in future, including to increase our understanding around the under-representation observed in the nominee pool and identify potential approaches for supporting inclusivity in the work of the panels. The recommendations made by EDAP in its final report provide specific examples for the funding bodies to consider in this regard.

94. For the first time, in REF 2021 we collected data on caring responsibilities from nominated and appointed candidates to enable us to monitor this through the

¹⁶ 'Analysis of full REF 2021 panel membership' (2021), available at www.ref.ac.uk under 'Publications and reports'.

appointments process. While the analysis showed there was no notable differences in the proportion with caring responsibilities between the nominated and appointed pools, intersectional analysis did highlight that female panels members were significantly more likely than males to have caring responsibilities.

95. In developing our questions on caring responsibilities we sought to draw on current best practice, and drew on existing organisational practice in the collection of the data more widely. During the course of the exercise, this approach highlighted two issues. Firstly, whether consideration should be given to the collection of data on socio-economic status. We explored this issue with EDAP early on in the exercise, through which it was agreed that given the complexities in capturing and measuring socio-economic status, and the absence of suitable benchmarking data within the sector, it would be most appropriate to consider and take account of this within a future REF exercise. Secondly, our approach to collecting disability data did not allow a more granular view of the nature of the disability, limiting our analysis of these data to the highest-level category only (i.e. whether or not the respondent considered themselves disabled). Best practice on the collection of data on protected characteristics continues to evolve and the funding bodies will want to ensure that collection of such data in a future exercise is done in accordance with this, including where applicable the collection of data on socio-economic status.

3.3 Recruitment of EDAP and IDAP

3.3.1 Recruitment of EDAP

96. Early on in the development of REF 2021, the funding bodies sought to establish the REF Equality and Diversity Advisory Panel (EDAP) to advise them, the REF team and the REF panels on developing and implementing measures to promote equality and diversity in the next REF. In March 2017, the funding bodies announced Professor Dianne Berry OBE as the chair of the panel, followed by the wider membership for the criteria phase in May 2017. The panel's first meeting was in June of that year, to advise on the development of key equality measures in the initial decisions being taken on the framework.

97. Members were appointed via a nominations process across the four funding bodies and, for this initial stage, the panel included eight members with expertise in equality and diversity issues affecting research careers and experience in research leadership and management.

98. During the course of the criteria phase, as the full role of the panel during the exercise was confirmed, the panel identified further areas of expertise it would require to fulfil its role during the submission and assessment phases of the exercise. Expertise was sought specifically in the areas of mental health practice; GP/medical experience; and/or HR experience/expertise. To widen the pool of potential candidates, appointments were made through an open, written applications process, and assessed against criteria published in a person specification.
99. In January 2019, we announced the appointment of seven further members to the panel, alongside the retirement of three criteria-phase members, bringing the total membership to 12. To further extend the membership and provide an appropriate number of members for the work in the assessment phase, and following the resignation of one EDAP member, two further members were appointed in early 2020.
100. The work of the panel is described throughout this report, in the relevant sections, as it related to the operational delivery of the exercise. Wider reflections on the panel's work and recommendations on equality, diversity and inclusion in future exercises are set out in the panel's final report¹⁷.

3.3.2. Recruitment of IDAP

101. Alongside the recruitment of EDAP, the funding bodies also sought to establish a new Interdisciplinary Research Advisory Panel (IDAP) to advise the REF team, REF panel chairs and the UK funding bodies on the approach to support the submission and assessment of interdisciplinary research in the REF. This followed on from the evidence and proposals set out in the Stern review about supporting interdisciplinary research in REF. Professor Dame Athene Donald was appointed by the funding bodies as Chair of IDAP and the wider membership was announced in April 2017. The panel's first meeting was in May of that year, to consider consultation responses, to input into the initial decisions on the REF and to advise on the appointment of panel members with respect to interdisciplinary research.
102. Members were appointed following a nominations process across the funding bodies and national academies. We also sought specific advice on the inclusion of

¹⁷ 'REF EDAP final report 2022', available at ref.ac.uk under '[Publications and reports](#)'.

practice research expertise from a newly established sector-led group with a remit in this area, the practice research advisory group). The appointed panel of 14 members included experienced researchers with extensive interdisciplinary and research assessment experience.

103. During the course of the criteria phase, IDAP considered and advised on the operation of the measures to support interdisciplinary research in the REF, including on its own remit during the assessment phase. In line with the defined remit, the membership of the panel changed to incorporate the interdisciplinary leads already appointed to the main panels. IDAP members who had since been appointed as chairs of members of the sub-panels stood down at the end of the criteria phase to avoid perceived or actual conflicts of interest, and ensure that IDAP stood separate from the assessment of submissions.
104. The work of IDAP is described throughout this report, in the relevant sections, as it related to the operational delivery of the exercise. Wider reflections on the panel's work and recommendations on measures to support interdisciplinary research in future exercises are set out in the panel's final report¹⁸.

3.4 Recruitment of ILEPP

105. The 'Initial decisions' document published in September 2017 set out the approach towards incorporating institutional-level assessment of the environment in REF 2021. This included the inclusion of information about the institutional environment alongside the unit-level information, to be reviewed by the relevant sub-panel. Alongside this, the standalone assessment of the institutional-level information would be piloted but would not contribute to the outcomes for REF 2021. The remit of the pilot panel was to explore the feasibility of an institutional-level assessment, to inform inclusion of this element in future exercises.
106. In October 2018 the funding bodies announced the chair of the pilot panel and invited expressions of interest (EOIs) for the membership of the panel. EOIs were reviewed against the published criteria by the selection panel made up of senior representatives from the funding bodies', and recommendations for appointment put forward to the funding bodies for approval. The membership

¹⁸ 'Interdisciplinary research advisory panel final report' (2022), available at www.ref.ac.uk under 'Publications and reports'.

was announced in November 2018, and included 17 members comprising senior research leaders with a breadth of discipline expertise across a range of UK HEIs, as well as individuals with expertise in the wider use and benefits of research, and those with senior-level experience in research management. The chair of EDAP was also appointed as an observer on the panel.

3.5 Secretariat recruitment

Key points

- We recruited the secretariat through an open recruitment process for key phases of the exercise; this was successful in appointing a well-qualified secretariat to support the panels.
- Part-time secretary positions were introduced for REF 2021, which had both advantages and drawbacks.
- Committee servicing for the advisory panels was resourced from within the REF team.

Recommendations

- Where part-time roles are maintained, explore with the secretariat approaches to widening experience across multiple panels.
- Consider providing advisory panel committee servicing through secondments.

107. For key phases of the exercise, we recruited a panel secretariat to provide committee servicing support and advice to the panels. They were recruited on secondment from institutions for the most part, although applications were openly advertised and welcomed from individuals based at any organisation that could support the secondment.

108. Following precedent from previous exercises, we also sought panel advisers with a thorough knowledge and understanding of the REF criteria and procedures, and experience in successfully providing guidance to academic committees. Secretaries were required to have a range of skills in servicing academic committees and an understanding of the REF, including key changes from 2014.

109. The meeting pattern for the main and sub-panels differed across the criteria and assessment phases of the exercise, which resulted in different secretariat requirements across each phase.

110. The secretaries supported up to three sub-panels across the four main panels during the criteria phase and early 2020 preparation meetings, when the sub-panels within the main panels met concurrently. During the assessment phase,

secretaries were primarily mapped to sub-panels within a main panel area as the sub-panel meetings were scheduled in smaller clusters. This facilitated working relationships among the secretariat within a given main panel and focused the adviser-secretary relationships more tightly.

111. For the criteria phase appointments, we ran the application process in autumn 2017, with appointments made in the December. We received over 90 applications and appointed ten advisers and 13 secretaries. The secondments began in February 2018.
112. In advance of the panel meetings taking place in early 2020, the REF team contacted the criteria phase secretariat members to confirm if they would be available to provide cover for the meetings. All advisers and all but three secretaries confirmed their intention to continue in these roles. However, there were several gaps in secretarial availability which meant that we needed to recruit additional cover from within RE for some of the sub-panel meetings. Five individuals from other teams within RE and one from the REF team supported the early 2020 round of meetings, undertaking analysis of the survey of submission intentions and providing the secretarial function for the meetings.
113. In July 2020, the REF Steering Group agreed to increase the allocation of time given to each member of the secretariat as recognition of impact of COVID-19 on the work of the panels, including the need to move to virtual meetings. This reduced the planned allocation of three sub-panels per full-time secretary to two.
114. As had been identified as an option at the start of the recruitment process, 15 members of the secretariat from the criteria phase continued on in the assessment phase, five as panel secretaries and 10 as panel advisers (two of whom were secretaries in 2018 and were appointed as advisers through the open process run in September 2020).
115. Based on the number of returning members of the secretariat, and our total requirements for resource arising from the change in allocation agreed by the steering group, in September 2020 we advertised for further applicants to the secretary and adviser roles to fill the remaining positions.
116. We had an excellent response to our advert, with 34 applicants for the panel adviser role and 47 applicants for panel secretary. In October 2020, we appointed

five advisers and 20 secretaries, with secretary appointments including 0.5 FTE (one sub-panel), 0.8 FTE (two smaller sub-panels) and 1.0 FTE (two medium-large sub-panels). The full secondment roles were scheduled to start from April 2021, with some time commitment required on a day-rate basis between November 2020 and March 2021 to cover the preparation meetings, secretariat training and some remote support to panels. As we approached the submission deadline, we found that some of the secretaries were being asked to provide more support to panels than had been expected – at a time when many of the secretaries were closely involved in the final stages of preparing their institutional submissions. The REF team wrote to sub-panel chairs clarifying the timing for the full start date of the secretariat, to help manage the expectations and workload in this period.

117. We also appointed two support secretaries on smaller fractional appointments, who would commence roles in April 2021 supporting some of the largest panels; in the event, one of these appointments took on a full secretary role during 2020, after an early withdrawal.
118. In response to some requests for undertaking this on a part-time basis from our criteria-phase secretariat, we built this into the recruitment process for the assessment phase. There were both advantages and drawbacks to this model, in that it allowed the participation of a wider group of individuals than a full-time only position would have – some secretaries combined a 0.5 FTE role with wider HEI duties, while for others it reflected existing working patterns. However, there are some benefits gained from working across multiple panels, such as increased learning around processes and panel expectations, that those with only one sub-panel were not able to draw on. Where retaining the option to take posts on a part-time basis in future exercises, the funding bodies should explore with the secretariat approaches to widening experience across multiple panels.
119. During the assessment year itself we ran a further round of secretariat recruitment to backfill for where some of the existing secretariat had needed to reduce the FTE of their secondment, and to provide additional resource for covering absence and giving extra support where needed. This aimed to respond to some concerns raised by the secretariat about the extra workload and pressures resulting from the virtual environment and wider COVID-19 effects. Through this process, we appointed two advisers at 0.5 FTE (one from among the existing secretaries), and four further part time secretaries.

120. Committee servicing for IDAP, EDAP and ILEPP was provided from the REF team across the different phases of the exercise. There were some advantages to this in the direct relationship that was developed between the team and the advisory panels, particularly for IDAP as a new panel where its assessment phase remit was developed through the criteria phase. However, there were also some drawbacks, including not having the wider sector experience and knowledge that the main and sub-panel secretariat brought to their roles, not fully enabling integration of the advisory panel secretaries within the wider team of secretaries – to support information exchange and mutual learning around best practice – and increasing the resourcing pressures on the REF team itself. In a future exercise, the funding bodies should consider providing advisory panel committee servicing through secondments.



4. Criteria-setting phase

4.1 Developing the draft guidance and criteria

Key points

- We developed the two primary guidance documents, the 'Guidance on submissions' and 'Panel criteria and working methods' simultaneously for REF 2021. This was an effective approach, but did add time to the production of the 'Guidance on submissions'.
- In addition to working closely with the panels in this period, we also undertook a range of activities throughout 2018 to feed into the development of the guidance and criteria, including sector engagement, working groups and workshops.

Recommendations

- Consider whether expert input from information design professionals would better support communication of the guidance and criteria.
- Work to explore greater use of metrics in the environment should be supported by a comprehensive review of potential metrics, with close involvement of the expert panels.

121. The two primary guidance documents for the exercise, the 'Guidance on submissions' (REF 2019/01)¹⁹ (which set out the general framework for assessment and guidance to institutions about making submissions) and the 'Panel criteria and working methods (REF 2019/02)²⁰ (which set out the assessment criteria and working methods of the main and sub-panels) were developed simultaneously for REF 2021, reflecting the recommendation to do so from REF 2014 and in view of wide support in the consultation on the second REF for this proposal.

122. The development of the 'Guidance on submissions' was carried out by the REF team and overseen by the REF steering group. We consulted the panels during their 2018 meetings – including both the main and sub-panels, as well as the two advisory panels (EDAP and IDAP). The simultaneous approach to development largely supported coherence across the guidance and criteria and enabled the REF team to closely involve the panels in the detailed operation of some of the

¹⁹ 'Guidance on submissions' (2019), available at www.ref.ac.uk under 'Publications and reports'.

²⁰ 'Panel criteria and working methods' (2019), available at www.ref.ac.uk under 'Publications and reports'.

more substantial changes since the previous exercise. However, there were a small number of instances where wording differences between the guidance and criteria caused some issues around interpretation, which could likely be avoided in future with increased cross-checking of the final documents. The simultaneous development also provided an opportunity to consult with the sector on key aspects of the 'Guidance on submissions'; the challenge with this for institutions was the additional time the consultation process then added to the production of the final guidance set.

123. Our approach to developing the 'Panel criteria' in REF 2021 sought to build further on the increased consistency seen in the 2014 documentation by producing one criteria statement across all main panels. This was intended to promote consistency in process and terminology where the same meaning was intended, while still allowing for discipline-based difference through main-panel specific text boxes throughout the document. This approach was also intended to offer easier navigation and quick reference to the differing requirements of across the main panels.
124. We consulted with the expert panels on this approach in the preliminary meeting round and drew on the advice received to produce the 'Guidance to panels' (REF 2018/04)²¹, which was considered at the subsequent meeting round in May. This guidance was published alongside the consultation documents in July 2018. In the event, we achieved consistency across a wider range of areas than originally envisaged – including in the definitions of the criteria for each of outputs, impact and environment – with real commitment shown by the main panels to increasing consistency where appropriate.
125. Given the expanded scope of institutions' codes of practice in REF 2021, the guidance on developing these codes was separated out from the 'Guidance on submissions' and published in draft alongside the other two documents in July 2018.
126. The main guidance documentation produced for the exercise was therefore quite considerable in volume and detail. While this level of information was necessary for supporting institutions with submissions, there were some reflections as to whether the material had been designed with accessibility in mind – particularly for those institutions less familiar with previous exercises. In producing the detailed guidance and criteria for future exercises, the funding bodies should

²¹ 'Guidance to panels' (2018), available at www.ref.ac.uk under 'Publications and reports'.

consider whether expert input from information design professionals would better support communication with participating institutions.

4.1.1 Impact workshops

127. To feed into the development of the guidance and criteria, the REF team ran two workshops in early 2018 to engage further on key issues in relation to impact. These included establishing principles around the assessment of case studies that were 'continued' from examples submitted in 2014; exploring approaches to broadening the underpinning research for impact; and, in partnership with the National Co-ordinating Centre for Public Engagement (NCCPE), understanding what additional guidance would be most useful on impact arising from public engagement.
128. The workshops were attended by academics, research professionals, research users and other representatives from the sector. The workshops highlighted key areas of consensus around the issues being considered, but also aspects where there were mixed views about how best to approach addressing these. The outcomes from the workshop were published on the REF website, and informed the panels' early consideration of the guidance and criteria in these areas.

4.1.2 Panel meetings

129. During the course of 2018, the main and sub-panels met across three rounds of meetings to finalise the guidance and criteria. This included two rounds of meetings prior to the launch of the consultation in July 2018, and one further round of meetings in late 2018 to respond to the issues raised during the consultation.
130. The sub-panel meetings in this phase included those members who had been appointed for the criteria setting. We followed the successful approach used in 2014 of bringing together all the sub-panels within a main panel at each meeting round. This allowed for both main-panel wide plenary sessions and individual sub-panel sessions, as well as opportunities for the main and sub-panel chairs to gather and reflect on the individual sub-panel discussions that had taken place during the day. The schedule of main and sub-panel meeting rounds was quite challenging in this period, so to support an efficient collation of advice on the most pressing issues we provided 'key decision templates' to the secretariat for completion during the meetings themselves (or immediately afterwards), with a longer, standard timeframe then in place for completing the full meeting minute.

131. IDAP and EDAP also met during this period, continuing to build on the advice provided during development of the initial decisions through their contribution to the development of the guidance and criteria.
132. IDAP provided advice to panels on the guidance and criteria in advance of the first round of main and sub-panel meetings, and met again in November 2018 to review responses to the consultation. The first meeting of the IDR network, a member-led forum to facilitate engagement across the main panel groups to share good practice, identify shared issues and support consistency of approach, was also held in November 2018, providing opportunity for both the network and IDAP to advise on revisions to the criteria following consultation and on assessment phase processes for supporting IDR. When it had completed this first main stage of its work, IDAP reported on its processes in developing IDAP's guidance for inclusion of IDR in REF 2021 and set out interim recommendations for the future²².
133. EDAP met three times across 2018, providing advice to the funding bodies and the panels on EDI in relation to the guidance and criteria, particularly in relation to the approach to taking account of staff circumstances and the guidance on codes of practice. This work was also informed by the REF equality impact assessment (EIA), which was initially conducted alongside the process for determining the high-level decisions for REF 2021, working with EDAP. The EIA continued to be updated at key points throughout the exercise²³.
134. The main and sub-panels received an equality briefing from EDAP to inform their work on developing the criteria. This provided information on the legislative context and equality and diversity considerations in relation to key elements of the exercise, including the research environment and citation data. The 'Equality briefing for Research Excellence Framework panels' (2018/05)²⁴ was later published on the REF website alongside the documents for consultation.
135. Following each round of main and sub-panel meetings, the four main panel chairs, advisory panel chairs, panel advisers and the REF team met to review outcomes and agree outstanding issues. This group also met in advance of the

²² 'Interdisciplinary Research Advisory Panel: Review of the criteria-setting phase' (2019). Available at www.ref.ac.uk under 'Publications and reports'.

²³ The most recent version of the EIA is available at www.ref.ac.uk, under 'Equality and diversity'.

²⁴ 'Equality briefing for the Research Excellence Framework panels' (2018), available at www.ref.ac.uk under 'Publications and reports'.

round three meetings to provide an overarching steer to finalising the guidance and criteria in the context of the consultation responses. We adopted a more formalised structure for this group in the 2021 exercise, which worked very effectively – helping to support consistency across the main panels, to consider and agree final advice on exercise-wide issues, and to support responsiveness where critically needed (as seen during the period when COVID-19 mitigations were being developed).

4.1.3 Additional guidance

136. The 2017 'Initial decisions' document set out the decision to increase the use of quantitative data in the research environment element of the assessment. To support the development of guidance on this, we worked with a working group of the Forum for Responsible Research Metrics to produce guidance for consideration by the expert panels.
137. The working group established a set of principles that should govern the inclusion of quantitative indicators in any guidance produced. The principles were reviewed and agreed by the expert panels at the early criteria-phase meetings. Drawing on these principles, the working group reviewed a range of possible indicators relevant to the assessment of the environment. Incorporating advice from the panels, this resulted in guidance and a set of example indicators²⁵ that institutions could draw on in their environment statements, along with information on how such data should be presented.
138. The final guidance and example indicators supported a more nuanced and optional approach to the inclusion of more quantitative data than perhaps had been initially envisaged when the decision was set out. This reflected some of the real challenges encountered by the working group in identifying existing indicators that were collected on a consistent basis across submitting institutions. In part, this was illustrative of the diversity of institutions that participate in the exercise, and the differences in approaches to managing research. However, it also reflected some limitations in the evidence base, which was drawn substantially from consultation activity and desk review by funding body staff. Furthermore, the commencement of the work prior to the start of the panels' work brought in some challenges around identifying the indicators which would be able to provide a meaningful view as to the aspect of quality being assessed. If the funding bodies wish again to explore greater use of metrics in the

²⁵ <https://www.ref.ac.uk/media/1019/guidance-on-environment-indicators.pdf>

environment in future exercises, this work should be supported by a comprehensive review of potential metrics, with close involvement of the expert panels.

139. The analysis of impact case studies in REF 2014 identified many instances of quantitative data supporting impact claims, but also great variability in the presentation of these data²⁶. We were therefore keen to increase the standardisation of the quantitative data cited in case studies – both to better support the panels' assessment process and the subsequent analysis of the impact case studies following their publication. Work was commissioned to produce guidance on standardised indicators, which resulted the report 'Guidance for standardising quantitative indicators of impact within REF case studies'²⁷. This was published alongside the main REF guidance and criteria. This provided both a style guide for reporting quantitative data, and specific guidance on formats for reporting frequently-used indicators to make them more discoverable within the case studies at the analysis stage.

4.1.4 Citation data

140. In 2017 the Forum for Responsible Research Metrics provided detailed advice to the funding bodies on the use of metrics in the assessment of outputs for REF 2021. The forum's key recommendations included that: panel advice should be sought on whether to adopt metrics/indicators, on the coverage of different providers and on the details of the benchmarking data; all panels should have the same citation data in the same format; and that alternative web indicators (altmetrics, web metrics, download indicators, etc.) should not be used for the evaluation of outputs. This advice informed the approach to the use of citation data that was set out in the 'Initial decisions' in 2017.

141. As part of this approach, early in 2018 we sought advice from the panels on the use, coverage and benchmarking of citation data in the assessment. Eleven of the 34 sub-panels opted to use citation data to inform their judgements. Informed by the panels' advice, we procured the citation data provision for REF 2021 through a formal tender process. Clarivate Analytics was announced as the provider in November 2018.

²⁶ King's College London and Digital Science (2015), *The Nature, Scale and Beneficiaries of Research Impact: An Initial Analysis of Research Excellence Framework (REF) 2014 Impact Case Studies*. Available at https://webarchive.nationalarchives.gov.uk/ukgwa/*/http://www.hefce.ac.uk/.

²⁷ 'Guidance for institutions on environment indicators', available at www.ref.ac.uk under 'Additional guidance'.

4.1.5 HESA staff record

142. During the criteria phase and beyond, the REF team, wider RE colleagues and Office for Students (OfS) staff engaged in regular discussions with HESA about new and amended fields in the staff return that would capture data required from institutions as part of changes made to the REF process. Some of the amendments were more straightforward, including updating the UOAs to the 2021 structure and bringing back the early career researcher field that had been used for the 2014 exercise. However, developing and defining others was more complex, particularly around fields that could identify eligible staff.
143. The regular discussions significantly supported this work and led to the inclusion of the new REF fields on a trial basis in the 2018/19 staff return. The new field to identify significant responsibility for research and for REF 2021 UOA were later clarified as being optional fields in that year's return. While this meant the data returned in 2018/19 was not complete or of high quality in all cases, the trial period did signal some areas where further clarification would be helpful for the 2019/20 return. See section 0 for more detail on our use of the 2018/19 data.

4.2 Consultation

144. The consultation on the draft guidance and criteria was launched in July 2018 and sought views on the following topics:
- clarity of the guidance
 - clarity and appropriateness of the assessment criteria
 - staff eligibility
 - equality and diversity
 - output eligibility
 - research activity costs for unit of assessment (UOA) 4 (Psychology, Psychiatry and Neuroscience)
 - balance between consistency and allowing for discipline-based differences.
145. The REF team engaged in a wide range of consultation activities in the early autumn, which aimed to clarify aspects of the proposed guidance and criteria and seek preliminary feedback on them. The engagement included consultation events for institutions – including a dedicated roundtable for institutions that were new to REF – dedicated workshops for research users to gather feedback on the impact proposals, webinars with each of the main panel chairs focusing in turn on the draft panel criteria of each of the main panels, a webinar and workshop with the EDAP chair focusing on the equality and diversity measures

set out in the proposals, REF team attendance at subject / representative body events, and a series of blogs focusing on different aspects of the guidance.

146. This range of activity was successful in highlighting the primary feedback anticipated through the formal consultation responses and enabled the team to provide greater clarity and context to the approaches set out in the draft documentation.

147. The consultation closed in October 2018 and 294 responses were received. Responses broadly welcomed the draft guidance and criteria as clear and appropriate but views were more mixed regarding:

- proposals relating to staff circumstances
- the proposal to make ineligible the outputs of former staff who have been made redundant
- proposed methods to capture research activity costs in UOA 4.

148. Responses expressed broad support for the deeper integration of equality and diversity into REF 2021, although there were requests for further clarity and amendments were suggested in this area.

149. Overall, many responses sought further guidance and clarity, particularly on the following aspects of the guidance and criteria:

- significant responsibility for research
- staff circumstances
- continued impact case studies
- the institutional-level environment pilot
- cross-referral
- interdisciplinary research (IDR)
- panel membership
- overlaps between research areas within specific UOAs.

4.3 Final guidance and criteria

Key points

- The final guidance and criteria were published in January 2019. The documentation was comprehensive and broadly supported institutions to make submissions that successfully demonstrated their research quality and were within the bounds of the new framework.
- Some of the newer aspects of the guidance in particular required further clarification through the publication of 'frequently asked questions'.

Recommendations

- Where greater comparability across the submitted staff pool is sought for institutions not returning 100 per cent of eligible staff, consider the scope for specifying a 'significant responsibility for research' in more detail.
- Provide a clearer specification of fractional staff eligibility, or a mitigated approach to applying audit outcomes, to address the risk of penalty in submitting staff on minimum fractional contracts.
- Consider the feasibility of developing the audit guidance alongside the main guidance documentation to support institutions.
- Explore whether the submission system could run checks against previously submitted outputs, to support institutions' compliance with the guidance.
- In developing the collection formats for outputs, consider undertaking a detailed review of dissemination methods to support a flexible and current approach to presenting outputs for submission, while meeting the assessment needs of the panels.
- Specify the requirements for the impact contextual data more closely to give greater clarity to institutions and potentially improve data quality.
- Consider reviewing corroborating evidence formats, to enable submission of a broader range of formats in future.
- Consider the routine provision of corroborating evidence for impact in consultation with the expert panels – in particular, to ensure there remains a level playing field in the nature of the material being assessed, as well as to keep in view the overall burden of the assessment process.
- Revisit the arguments for and against a minimum of one or two case studies in the context of the wider rules for a future exercise.

150. The final guidance and criteria were published in January 2019, including the 'Guidance on submissions' (REF 2019/01), the 'Panel criteria and working methods' (REF 2019/02) and the 'Guidance on codes of practice' (REF 2019/03)²⁸. Alongside these publications, the funding bodies provided background information on some of the key decisions²⁹ that were taken in view of the

²⁸ All three documents are available at www.ref.ac.uk under 'Publications and reports'.

²⁹ The 'Key decisions' document is available at www.ref.ac.uk under 'About the REF'.

consultation responses. This included further guidance on the requirement to submit all staff – including where staff responsibilities have changed over the assessment period, where staff had been made redundant, the eligibility of overseas staff, and determining independence for staff on 'teaching and research' contracts; key decisions in relation to outputs; and the outcomes of a cost allocation pilot run for UOA 4: Psychology, Psychiatry and Neuroscience.

151. We initially proposed to make ineligible for submission to REF 2021 the outputs of former staff who had been made redundant (except where the staff member took voluntary redundancy), and consulted on this proposal in July 2018. The submissions to that consultation were divided on this question. Those who agreed with the proposal expressed support for the rationale. However, a number of responses raised significant issues including potential sharing of sensitive information about staff employment and implications for fixed-term staff usually considered redundant at the end of contracts lasting two or more years.
152. Consultation responses were considered alongside further discussion with the expert panels and, having considered the balance of arguments, the funding bodies decided to allow the submission of outputs of former staff made redundant because of the significant unintended consequences of not doing so. As part of this, HEIs were required to outline in their Codes of practice and environment statements their approach to including the outputs of former staff made redundant within their submissions. Following announcement of this decision, a small number of further queries from HEIs and other stakeholders were answered as they arose. These queries generally focused on ensuring full understanding of the policy, although a small number urged reconsideration of the policy for future exercises given potential unintended consequences for individuals under both eligibility and ineligibility of affected outputs.
153. During the consultation process, the funding bodies explored an approach to capturing data on research activity cost for outputs submitted in UOA 4, which sought to introduce a way to recognise the differing balances of research activity costs in submissions made in this UOA. Proposals were set out in the 'Draft guidance on submissions' and, alongside the consultation, we piloted the approach with 61 institutions. While the pilot concluded that the process of assigning costs was moderately straightforward, responses to the consultation proposals were very mixed. We worked closely with Sub-panel 4 on agreeing the best way forward. In view of the significant concerns raised by some of the

relevant subject communities, it was agreed that the approach did not have sufficiently broad support from the community to proceed.

154. The published guidance and criteria were comprehensive and broadly supported institutions to make submissions that successfully demonstrated their research quality and were within the bounds of the new framework. Following the publication of the final guidance and criteria we received a significant increase in queries about the exercise and developed a triage and management process for handling queries efficiently and effectively within the REF team. Complex queries requiring policy decisions were referred to the REF Steering Group as appropriate. Some of the newer aspects of the guidance in particular required further clarification through the publication of 'frequently asked questions'.
155. Some of the more frequently addressed topics raised through queries to the REF team included those relating to staff circumstances, open access (particularly technical questions), arrangements for the submission of particular output types (particularly multi-component outputs), and the eligibility of pre-prints and outputs submitted to REF 2014. More detail on these areas of the guidance are set out below.

4.3.1 Submitting staff

156. The arrangements for submitting staff and outputs saw some of the biggest changes to the exercise in contrast to REF 2014, as we moved to requiring the submission of all staff with significant responsibility for research; partially decoupling the submission of outputs from staff – so that a unit was required to return a set number of outputs based on its total submitted staff FTE, within a minimum and maximum number of outputs attributable to any one of those staff members; and allowing the outputs of former staff members to be optionally included in the total number of outputs for return. The consultation processes across 2017 and 2018 refined the detailed guidance on these aspects. However, understandably, there remained a need to clarify key aspects of the new guidance through FAQs, such as around which outputs could be included for current staff, whether former staff were required to be included (they weren't), and more technical details around how the minimum and maximum rules applied to co-authored outputs and reserves for double-weighted items.
157. The guidance on identifying which staff had significant responsibility for research was aimed at being sufficiently flexible to support its application across the

diversity of employment practices and approaches that there are for managing staff time for research across the UK's submitting institutions. As noted through EDAP's review of the processes developed to identify such staff that were set out in the codes of practice, this resulted in a range of different approaches being followed by different institutions. Some of these differences related more to local employment practice, while others reflected differing interpretations around what a 'significant responsibility' looked like. Informed by some of the more common practices described in codes of practice, the funding bodies should consider whether there is scope for specifying significant responsibility in more detail if greater comparability across the submitted pool is required in cases where institutions are not returning 100 per cent of eligible staff.

158. The review of the codes of practice also highlighted a key area where the guidance on significant responsibility was not always fully understood. In several cases initial processes included the products of research (such as output volume or quality) in contradiction to the guidance that required processes to be based on employment expectations (and expressly not on the quality or volume of outputs already delivered). These codes needed to be revised prior to approval by the funding bodies.
159. The move to an all-staff return for REF 2021 provided greater transparency and clarity for staff, which in turn addressed some of the more divisive potential in a selective model. However, the requirement introduced additional complexity in some areas of the guidance, including for staff on secondments, on which we received numerous queries in the run up to the submission deadline, and staff on fractional contracts.
160. We introduced an eligibility requirement for REF 2021 for staff to have a substantive research connection with the submitting unit. This sought to respond to concerns raised by panellists in REF 2014 about staff who had joined an institution on a fractional contract, but had little apparent connection with it (typically holding substantive academic positions overseas). Broadly, the requirement – including for a statement evidencing the connection for staff on minimum fractional contracts – addressed the issue as identified by panellists previously. In a small number of cases, however, it presented a particular challenge for submitting institutions in the way it interacted with the requirement to submit all staff. As determining a substantive connection required an element of judgement, there was risk inherent in either submitting such staff and demonstrating this sufficiently, or alternatively in not submitting such staff who

could later be deemed through audit to be eligible and thus 'missing' from the submission. In any staff submission process in a future exercise, the funding bodies will need to address this risk of penalty in either direction through either clearer specification of fractional staff eligibility, or a mitigated approach to applying audit outcomes.

4.3.2 Outputs

161. The open access policy was newly introduced for REF 2021 and, while the policy intention and broad approach had been announced relatively early in the assessment cycle, the detailed requirements could only be articulated in full in the 'Guidance on submissions' when the details of the overall framework were known. This aspect of the guidance generated a substantial proportion of the queries we received in the earlier part of the submission stage, including detailed technical queries and several related to the forthcoming audit requirements. The audit guidance followed later in 2019 and the gap between this and the earlier confirmation of the full requirements in the 'Guidance on submissions' caused some degree of uncertainty for institutions – particularly for open access, but also in relation to other aspects of the framework. In a future exercise, the funding bodies should consider the feasibility of developing the audit guidance alongside the main guidance documentation to support institutions, although the potential impact of this upon the timeframe for publishing the guidance will need close consideration.
162. We also received a high volume of queries about the eligibility of outputs that had been pre-published in the previous assessment period, including 'online first' versions, or outputs available in full in another form in the previous period. We were able to confirm that the guidance was intended to be broadly interpreted, which reflected the intention of the funding bodies to recognise the evolving publication landscape and the complexity of decisions HEIs need to take in terms of submitting outputs published in differing forms and at different stages in the research process. The primary criterion in relation to eligibility was whether or not the item had been submitted (by any institution) in REF 2014.
163. During the assessment year we identified a number of outputs that had also been submitted in the previous exercise by comparing the DOIs of submitted outputs with the published list of outputs submitted in REF 2014. Through the audit process, it was clear that some HEIs had experienced challenges in identifying these outputs during their preparation of submissions. In future

exercises, where any similar arrangements are in place, it would be beneficial for the submission system to run checks against previously submitted outputs to support institutions in complying with this aspect of the guidance.

164. Later in the submission phase, we received several queries relating to output formats, particularly in relation to non-text based outputs and multi-component outputs. Some of these related to policy clarification – for example, around what could be included as a multi-component output – in some instances, submission of these output types were still not in line with the spirit of the criteria, suggesting there is further scope for defining what constitutes a multi-component output in future. A number of queries concerned technical matters relating to the submission of outputs. This covered issues such as submitting items requiring a user account or password, which outputs could be submitted as uniform resource locators (URLs), and how best to present websites for submission. The range of queries received in this area may be reflective of the evolving ways in which research – including practice research – is disseminated. During the development of the guidance and criteria, we worked with the expert panels to expand the collection formats for outputs from the previous exercise, using the REF 2014 guidance as a starting position. We also needed to ensure technical issues were managed, including access without the use of specialist software, and overall storage requirements for the submission system. In developing the collection formats for outputs in a future exercise, the funding bodies should consider undertaking a detailed review of dissemination methods that can support a flexible and current approach to presenting outputs for submission, while meeting the assessment needs of the panels.

4.3.3 Impact

165. Given the broad continuity in the impact guidance between REF 2014 and REF 2021, the new material developed for this exercise was primarily aimed at expanding and clarifying aspects of the framework for impact. One illustration of this is the 'Examples of impacts and indicators' included at Annex A of the 'Panel criteria', which was noted as a useful guide by both institutions and panellists. There seemed to be in general a wider confidence in preparing case studies for submission and institutions succeeded in submitting case studies that were in scope and satisfied the threshold criteria – only 0.3 per cent of impact was judged as unclassified across the exercise.

166. Areas of the guidance where we received queries from institutions tended to relate to those areas where there had been some ambiguity in the rules last time – for example, whether the word limits and number of references or corroborating contacts were simply indicative or to be strictly adhered to. We also received a number of queries relating to the new requirement to include contextual data (on funders, grants and so on), where available, alongside the case study. As these data were not used in the assessment itself, but collected to support the analysis phase following publication, they were only lightly specified. To give greater clarity to institutions and potentially improve data quality, there may be value in specifying the requirements for these items more closely in future.
167. The up-front collection of corroborating evidence was also a new feature in the guidance for 2021 – although this requirement was relaxed in the submission year as one of the mitigations in place for COVID-19 (see section 0 for more details). This requirement therefore generated some queries around the technical aspects of submitting the evidence, which needed to be compatible with PDF submission in REF 2021; a review of this to consider enabling submission of a broader range of formats could be undertaken for the future. More broadly, the more direct availability of the evidence raised questions in some panels around whether access to it should have been a routine part of the assessment process for case studies (rather than accessed on an audit basis only, where panellists identified concerns). The funding bodies should consider this point carefully in consultation with the expert panels for a future exercise – in particular, to ensure there remains a level playing field in the nature of the material being assessed, as well as to keep in view the overall burden of the assessment process.
168. The number of case studies required was set in line with the changed approach to submitting staff in REF 2021. In response to feedback during the development of the guidance, the threshold between submitting the required minimum of two case studies and moving into the next band was increased to 20 FTE (from 15 FTE). While this gave some support to those small units that were likely to increase slightly in size due to the new rules, some concerns continued to be raised about the minimum of two requirement for very small (for example, units of five FTE or fewer) and / or newly established units. These concerns were sometimes raised comparatively with the increased threshold bands for submissions over 100 FTE. The arguments for and against a minimum of one or two case studies are finely balanced and the funding bodies should revisit these in the context of the wider rules for a future exercise. Where so doing, there are

some specific issues that will need to be revisited – including risks in publishing the score for an individual case study, particularly where based on an individual's work.

4.3.4 Environment

169. During the development of the guidance and criteria with the expert panels, we arrived at an environment template structure that was broadly consistent with the previous exercise. While our original aim to build in more standardised quantitative data into the environment template was only partially met (see section 0), however, the range of topics for inclusion in the template had increased since 2014. For example, information was requested on approaches to open access and research integrity, in addition to the incorporation of the unit's approach to supporting and enabling impact and strengthened requirements around EDI. In common with the previous exercise, institutions did not require significant additional clarification on the completion of the narrative template, with most environment queries we received relating to technical issues around the REF4 data, and some in relation to the completion and use of the REF5a institutional environment statement.

170. During the assessment phase, however, panels again found this part of the assessment to be less evidence based than outputs and impact, with feedback from several panels that more standardised metrics were required. There was also some feeling that the integration of impact throughout the template had not provided a distinct enough focus on the structures in place and support provided by units for impact.

171. In addition to the use of the REF4 data in assessing environment, in REF 2021 submissions also included an institutional-level environment statement (REF5a) and a short COVID-19 annex. A standalone assessment of the REF5a, informed by the COVID-19 annex, was undertaken by a separate panel as part of the pilot of institutional-level assessment, which concluded that there is significant potential in the approach for future exercises³⁰. The sub-panels made use of these materials to inform and contextualise the unit-level assessment. However, the views of the expert panels on the value of the REF5a for supporting unit-level assessment were not so positive, with challenges identified in the relationship between the documents as well as within the REF5a itself. The balance of these

³⁰ 'Institutional-level Environment Pilot Panel final report' (2022). Available at www.ref.ac.uk under 'Publications and reports'.

views will require careful consideration in designing the most appropriate level and approach for assessing environment in future exercises.

4.4 Guidance on staff circumstances

Key points

- Arrangements to take account of the effects of staff circumstances were developed through consultation with the sector. Following publication of the final guidance, we sought to provide institutions with more support to understand the new approach.
- In reviewing reductions applied by HEIs, EDAP observed considerable variation in the extent to which unit reductions were used.
- Six per cent of staff were submitted with circumstances in REF 2021. This showed a considerable reduction to the 29 per cent of staff returned with circumstances in REF 2014, reflecting the changes made to the submission of staff and outputs.

Recommendations

- Set the deadline for any advance review of staff circumstances after the staff census date, to reduce complexity around the final submission of circumstances.

172. To support the development of the initial decisions and detailed guidance on EDI across all aspects of the framework, we appointed an expert advisory panel, EDAP, at an early stage in the process (see Section 0). Advice was sought from EDAP across a range of measures, including the approach to panel recruitment and briefings, addressing EDI in the environment, codes of practice and measures to take account of individual staff circumstances.

173. The Stern reforms to the REF created some degree of tension between the ambition of fully decoupling staff and outputs and approaches to recognising the effect of staff circumstances on output productivity – which of course is a matter of an inherently individual nature. Our early consultation work had highlighted that, while there was wide support for the principle of decoupling, there were clear concerns around the suggestion that this would ‘negate’ the need for an individual circumstances process. This informed the preliminary decision in 2017 that circumstances arrangements would be developed. In developing these measures, working closely with EDAP, we sought to achieve the best balance between supporting EDI at the level of individual staff and operationalising an approach in the context of decoupling.

174. Initial policy development focused on the overall effect of circumstances on a unit's available output pool, where a threshold proportion of staff had been affected. Concerns were raised by the expert panels about this approach, rather

than one focused on individuals' contributions to the pool. This included concerns that such an approach would not appropriately recognise the effect of individual circumstances on productivity, and the potential for negative incentives (for example, around recruitment) to result from this. We therefore consulted on more open approach, drawing on the tariff-based reductions in place in REF 2014.

175. Responses to the consultation were very mixed to these proposals, indicating the balance may not be sufficient to mitigate against the use of reductions to concentrate quality in submissions. Concerns were also raised that staff might be put under pressure to disclose sensitive information, which would benefit the institution rather than the individual. Revised guidance therefore sought to ensure that staff declaration was a voluntary process, with a key focus on recognising the effect of circumstances on staff ability to contribute to the output pool and providing appropriate support for them. These considerations were explained in more detail in an open letter from the EDAP chair³¹, alongside publication of the final guidance in January 2019. Reductions drawing on the tariff-based model could also be applied where a unit's output pool had been disproportionately affected by the cumulative effect of circumstances in the unit.
176. We worked closely with EDAP on developing the guidance for determining a disproportionate effect. Without previous precedent and recognising the likely differing nature of this effect across units of different sizes, institutional contexts and disciplinary publishing norms, the guidance did not include quantitative thresholds. Through our review of codes of practice in 2019 and via engagement with sector groups during the submission phase, we noted that institutions needed more support to understand the guidance – including what the funding bodies' expectations were in relation to staff circumstances and when a request to reduce a unit's output pool could be made. In September 2019, therefore, an open letter on staff circumstances³² was sent to heads of institutions from the chair of EDAP and the chair of the REF Steering Group to clarify these matters.
177. Nonetheless, in both the advance requests made in 2020 and the final reductions applied at the submission deadline, EDAP observed considerable variation in the extent to which unit reductions were applied across submitting institutions –

³¹ The open letter to the UK Higher Education sector on equality and diversity in REF 2021 is available at www.ref.ac.uk under 'About the REF'.

³² The open letter to UK higher education institutions on staff circumstances in REF 2021 is available at www.ref.ac.uk under 'About the REF'.

variation that the panel felt was unlikely to reflect differences in the prevalence of staff with equality-related circumstances across institutions³³. The panel set out several recommendations for taking account of circumstances in a decoupled model in future exercises aimed at reducing burden and increasing consistency in the process. These included the provision of a single definition of disproportionality being provided up front, informed by experience gained in REF 2021.

178. The majority of staff circumstances reductions applied in REF 2021 were assessed in advance of the submission deadline, giving greater confidence to institutions in applying reductions without the risk of penalty. The value of this pre-submission stage was highlighted by the improved evidencing of reductions that were newly applied at the submission deadline, and very low rates of reductions that were not accepted, as summarised in EDAP's final report. However, the guidance for updating or newly applying circumstances after the advance review stage was quite complex and we received a lot of queries from institutions in relation to this. While the advance process did need to provide outcomes prior to the submission deadline, it may have reduced the complexity around the final submission of circumstances if the advance review deadline had been set after the staff census date.

179. In total, six per cent of staff were submitted with circumstances in REF 2021. This showed a considerable reduction to the 29 per cent of staff returned with circumstances in REF 2014, reflecting the wider changes made to the submission of staff and outputs. In keeping with the previous exercise, analysis continued to show no differences in quality of outputs attributed to staff with circumstances compared with those for all staff.

³³ 'Equality and Diversity Advisory Panel final report' (2022), p. 14. Available at www.ref.ac.uk, under 'Publications and reports'.

4.5 Guidance on interdisciplinary research

Key points

- Strengthened measures were in place to support the fair and equitable submission and assessment of interdisciplinary research (IDR) in REF 2021.
- Additional guidance was produced to support institutions' and panels' understanding of assessment processes for IDR.
- IDAP's review of the measures concluded that they in the main helped ensure visibility of IDR and supported equity in the assessment process. However, key challenges were also noted, including inconsistent use of the IDR identifier by submitting institutions.

Recommendations

- If an IDR identifier is retained as one of the key measures for supporting IDR, consider how greater consistency in flagging could be achieved.

180. We sought to strengthen measures to support the fair and equitable submission and assessment of IDR in REF 2021. Informed by advice from IDAP, this included the appointment of IDR advisers to the panels, an IDR identifier for outputs along with a REF definition of IDR to support institutions in using the identifier, additional guidance for the assessment of IDR, and guidance on addressing IDR in the environment component.
181. Consultation responses on the draft guidance and criteria showed wide support for the increased emphasis on IDR, but with calls for further clarity on the new roles and assessment processes. In addition to addressing these points in the final published guidance and criteria, we also produced a summary document³⁴, bringing together the IDR guidance and criteria from across multiple places in the final documentation.
182. While we aimed to be as clear as possible about the operation of the new measures in the published guidance and criteria, some of the details would inevitably need to be developed responsively during the assessment process itself. This meant that some confusion persisted around what would happen to flagged outputs, both within the panels and within submitting institutions. To address this, in November 2020 we published an IDR protocol³⁵ that we developed with IDAP and the main panel chairs. The protocol set out in more detail how flagged outputs

³⁴ The summary document bringing together all guidance on the submission and assessment of interdisciplinary research in REF 2021 is available at www.ref.ac.uk under 'Additional guidance'.

³⁵ The Interdisciplinary Research protocol is available at www.ref.ac.uk under 'About the REF/Interdisciplinary Research'.

would be handled and how the different IDR roles would work together across the panels.

183. Reflecting on the set of measures put in place for REF 2021 in its final report, IDAP noted that they in the main helped ensure visibility of IDR and supported equity in the assessment process³⁶. However, key challenges were also noted, with a particular issue identified around the inconsistent use of the IDR identifier by submitting institutions.
184. The very varied use of the flag to identify IDR outputs to the panels ultimately prevented our intended use of the data to estimate the prevalence of IDR and analyse assessment outcomes for IDR outputs. It will be important to ensure momentum is maintained on ensuring visibility and equitable processes for IDR in a future exercise; however, building on IDAP's recommendations, careful consideration will need to be given to how greater consistency in flagging could be achieved if an identifier is retained as one of the key measures.

4.6 Revisions to the guidance due to COVID-19

Key points

- In March 2020, the REF was put on hold in response to the effects of COVID-19.
- Through consultation with the sector and panels, a revised timetable and mitigations to account for the effects were put in place in summer 2020 and January 2021.
- The measures were successful in supporting submissions and maintaining confidence in the robustness of an exercise into which much time and effort had been invested across the sector and the funding bodies to date.

185. In March 2020, it became clear that COVID-19 would start affecting institutions' submission preparation for REF, particularly where staff resource was needing to be diverted to critical areas in response to the pandemic. During this period, we wrote twice to universities in relation to contingency measures being considered for the REF due to COVID-19. The second of these notified them that the funding bodies had taken the decision to put the REF on hold so that these other activities could be prioritised without concern for the effect on REF preparations.

³⁶ 'Interdisciplinary Research Advisory Panel: final report' (2022). Available at www.ref.ac.uk, under 'Publications and reports'.

186. The REF team then commenced planning in earnest to understand the nature of the effects, how these could be mitigated against and how we could most effectively consult with the sector on these issues, seeking to balance engagement with low burden during this disrupted period. We undertook this consultation via two live webinars and, for each, a related short, online survey. The first webinar was held in April 2020 to look at the best timing for resuming the exercise and the assessment period for impact (widely considered as one of the more affected aspects of submissions); we ran the second webinar in June 2020 to focus on the detailed mitigations required across the exercise. There was wide engagement with this approach, with over 650 responses received for the survey on the timetable alone.
187. Consultation with the expert panels was a critical input to the process of revising the framework, but the planning for this presented us with some logistical hurdles to ensure we could engage widely across the main and sub-panels within a short period of time. We began with meetings of the main panels during April 2020 to get immediate input on the revised timeframe for the exercise and implications for the assessment year. These meetings had pivoted to virtual format in view of the lockdown restrictions and provided the first experience of running REF panel meetings remotely. Starting with a further round of main panel meetings, we then ran webinars for each main panel grouping of all main and sub-panel members in June to provide an update on decisions to date and seek preliminary input on the developing mitigations. Across June and July we scheduled a virtual meeting for each of the 34 sub-panels, to gather advice on the proposed mitigations and commence planning for the assessment under the new timeframe. A final meeting of the REF team and four main panel chairs was held in mid-July to finalise advice and recommendations from the panels on the revised guidance.
188. To gather more information on the effects of COVID-19 on submissions and approaches to mitigating these, we ran three expert advisory groups in early June. We held one each on submissions mitigations for the Output (including staff circumstances), Impact and Environment elements of REF. The groups comprised both REF panel members, secretariat and external representatives with expertise in the respective areas. These groups were very useful for gaining detailed insight into the different effects – across institution types and different discipline areas – arising from the COVID-19 pandemic, and testing out preliminary thinking on approaches to mitigating these. The outcomes from the groups went on to

inform our proposals to the wider sector in the second consultation webinar and survey.

189. We convened meetings of the REF Steering Group at more frequent intervals during the period between March and July 2020 to respond quickly to the developing situation with key decisions. This included early decisions in March 2020 on what aspects of the exercise should continue during the paused period and which activities should be delayed in line with it. For example, it was agreed at this stage, given the deadline for the advance review of circumstances had already passed earlier in March, that EDAP's assessment of the reduction requests should continue as planned (on a virtual basis); and the nominations deadline for further panellists was pushed back, but the nominations form remained open.
190. To support decision-making about revisions to the exercise on a short timescale, the steering group considered the range of feedback we received from the panels, expert groups and wider consultation activity alongside the following set of key criteria, in place for revising details of the exercise:
- a. Ensure robust assessment that carries the confidence of the sector
 - b. Meet the REF principles of equality, equity and transparency
 - c. Minimise additional burden, and seek to reduce it where possible
 - d. Take account of affected areas of submissions.
191. We also conducted an equality impact assessment on the revised deadlines for REF 2021. We commenced the assessment during the process for consulting on, and agreeing, the revised submission deadline for REF 2021 and reviewed it at key stages in the lead up to the submission deadline³⁷.
192. In responses to the survey on timeframe, there was majority support among submitting institutions for a short delay to the submission deadline until March 2021³⁸. Key reasons for this included that a short delay offered the best balance in recognising the effects, while continuing the momentum – particularly given the late stage of the cycle and the effort made so far with submission preparation. There was also support for keeping funding informed by REF 2021 according to the original timetable. Views on whether to extend the assessment

³⁷ The final EIA on the revised deadline is available at www.ref.ac.uk, under 'Equality and Diversity'.

³⁸ 'Survey on initial views on the REF timetable: Summary of responses' (REF 2020/01). Available at www.ref.ac.uk, under 'Publications and reports'.

period for impact were more mixed; informed by the arguments set out, as well as advice from the panels and the expert advisory group, the funding bodies agreed that a universal extension to end of December 2020 best met the criteria outlined above. However, it was made clear that case studies were not required to report up until this extended deadline. The decisions on the timeframe were announced in June 2020, signalling that the exercise would 'restart' at the end of July 2020, which was eight months before the new submission deadline in March 2021³⁹.

193. In view of the ongoing uncertainty presented by COVID-19, as part of announcing the new deadline the funding bodies scheduled a date in the autumn to review it in the light of the level of disruption being experienced due to COVID-19 at that stage. On the basis of the review, the funding bodies confirmed in November 2020 that the revised March deadline remained in place; however, the review also highlighted some particular issues, around the collation of physical outputs and the preparation of income-in-kind (REF4c) data, for which additional provisions were set out. The funding bodies also noted several areas that were being kept under close review, in the context of the ever-changing course of the pandemic.

194. The proposed revisions to the guidance that were considered at the second webinar and survey set out mitigations for identified issues in each of the sections of submissions. Proposed revisions were largely welcomed but there were calls for greater clarity on particular details⁴⁰. Informed by this feedback, and advice from across the panels and expert advisory groups, the funding bodies agreed the final set and we published the details in the 'Guidance on revisions to REF 2021' (REF 2020/02)⁴¹ in July 2020. We also added an index to the front of previously published guidance documents to indicate where the revisions changed or updated the earlier guidance. In brief, the revisions included:

- A provision to incorporate circumstances related to COVID-19 in removing the minimum of one output requirement.

³⁹ See the letter to HEIs: 'Revised submission deadline and the assessment period for impact' (2020). Available at www.ref.ac.uk, under 'Publications and reports'.

⁴⁰ See the 'Survey on proposed modifications to the 2021 Research Excellence Framework: summary of responses' (2020). Available at www.ref.ac.uk, under 'Publications and reports'.

⁴¹ 'Guidance on revisions to REF 2021' (2020), available at www.ref.ac.uk under 'Publications and reports'.

- A provision for submitting outputs delayed beyond 31 December 2020 due to COVID-19
- The inclusion of an optional statement for impact case studies, where contextual information about COVID-19 effects is required for the panel to understand aspects of it.
- Submission of a COVID-19 annex to the institutional-level environment statement, to describe the particular changes affecting the institution's research and impact environment.
- Guidance on addressing future strategy in the environment narratives.

195. Across December 2020 and January 2021, the UK experienced significant further rates of COVID-19 infection and consequent restrictions were put in place. In early January, the funding bodies continued to keep contingency measures under close review. It was noted that key risks around increased COVID-19 measures and/or significantly worsened rates of infection may result in individual HEIs being unable to meet the submission deadline in March 2021. The REF team received a range of evidence from institutions and took further advice from the main panel chairs and panel advisers during this period. This identified particular risks for Main Panel A areas, where clinical academic staff were being called to frontline services; for small HEIs with single-person or very small REF teams; and for research professional staff more widely, in finalising submissions under the lockdown restrictions in place. These pressures were falling more heavily on certain aspects of submissions, including collating supporting evidence for impact case studies, preparing PDFs, open access checks, and collating physical outputs.

196. On 21 January 2021, the REF team wrote to institutions confirming a further set of measures aimed at supporting universities to address the challenges identified in an appropriate way for each individual institution (noting that the effects varied across institutions)⁴². We had not received evidence that suggested further general delay should be considered, and were keen that institutions were not required at that stage to invest further beyond what was needed to complete the submission process.

197. The measures therefore included making optional the upfront provision of corroborating evidence for impact; being able to request an extension as needed to the provision of narrative templates (for impact and/or environment);

⁴² See 'Decisions on further contingency measures' (2021). Available at www.ref.ac.uk, under 'Publications and reports'.

introducing a 'corrections' window post-submission, where errors were identified in the submitted data following the submission deadline; moving back the period for submitting any adjustments to the REF-held copy of staff HESA data to after the submission deadline; and additional flexibility in the audit process. We also set out a route for considering emergency wholesale extensions for any institution with concerns about meeting the submission deadline, to be considered on a case-by-case basis.

198. Through working in close collaboration with the expert panels, secretariat, and the wider sector, we were able to respond quickly to the developing pandemic. The resulting measures across July 2020 and January 2021 were successful in supporting submissions and maintaining confidence in the robustness of an exercise into which much time and effort had been invested across the sector and the funding bodies to date. Some of the mitigations went on to present some challenges for the panels during the assessment phase, and for the REF team in their implementation and knock-on effects. These issues are considered in more depth in subsequent sections.



5. Submissions phase

5.1 Eligibility to participate

Key points

- In view of the changes to the HE landscape in England brought about by the Higher Education and Research Act (2017), it was necessary to define more explicitly which organisations were eligible to participate in the REF.
- We received a small number of requests to participate in the exercise from institutions, which required an assessment of eligibility. Some of these requests were made late on in the submissions phase.

Recommendations

- The UK funding bodies should give close consideration to an effective communication approach with the potential range of eligible HE providers at the outset of the exercise.

199. In view of the changes to the HE landscape in England brought about by the Higher Education and Research Act (2017), it was necessary to define more explicitly which organisations were eligible to participate in the REF. The 'Guidance on submissions' set out the eligibility criteria for institutions that wished to partake

in the REF, including the definition of 'HEI' that pertained to each UK country. The guidance also described this in more detail for providers in England, in relation to the period before and following the enactment of the new legislation.

200. Across all UK countries, eligibility included a requirement to have research degree provision, or to be implementing a research strategy that can demonstrate appropriate development and an increasing focus on research. Where HEIs without research degree provision wished to take part, they were required to contact the relevant funding body to request permission to participate.
201. HEIs intending to participate in the REF were each required to submit a code of practice for approval by the funding bodies, and to complete the survey of submission intentions by 6 December 2019.
202. Following a late request by an eligible institution to take part in the exercise, the REF team identified from the OfS Register a list of 195 HE providers in England who were potentially eligible but from whom the REF team had not received a code of practice for review or other indication of an intention to take part. We wrote to these providers in November 2019 to indicate our understanding that they did not intend to participate in the exercise. The letter asked any HEIs that did intend to participate to contact the REF team, with a short deadline for submission of a code of practice. The deadline for completing the survey of submission intentions remained 6 December 2019.
203. The letter yielded one request from an institution without research degree provision to participate in the exercise. Following consideration by Research England, it was determined that the provider did not meet the eligibility criteria at the current stage of its research development.
204. In mid-2020, we received a further request from an institution, also without research degree provision, to participate in the REF. The request came after the REF census date for staff had passed on 31 July 2020. Given the late stage of the request, the institution had not participated in the survey of submission intentions or returned a code of practice. The code would therefore need to be written after the census date, meaning decisions about staff eligibility would be made after the REF census date and applied retrospectively. It was considered that allowing new entry at that stage would raise significant concerns in terms of the level playing field within which institutions operate and by which the

assessment processes are applied. The request was therefore not accepted by Research England.

205. Our experience in dealing with the small number of providers that made late requests to participate in the REF highlighted a potential communications gap with those that had not previously participated in an assessment exercise, but for whom the legislative changes now made this a new prospect. Both the late request in 2019 and the second in 2020 came from institutions that had not been aware of the REF guidance or requirements until they made contact with the REF team – and the second provider had been sent the November 2019 letter (but was not aware of it). This suggests that in future, the funding bodies should give close consideration to its communication approach with the potential range of eligible participants at the outset of the exercise.

5.2 Codes of practice review

Key points

- Codes of practice on key submission processes were required. These were intended to support institutions in promoting equality, complying with legislation and avoiding discrimination in preparing submissions for REF.
- The codes were reviewed in 2019 by EDAP. The majority were judged to adhere to the guidance – although a large proportion required amendment in relation to a minor omission.
- The review of codes included a significant role in reviewing compliance with the wider guidance, alongside consideration of the documented processes from an EDI perspective.
- Codes of practice were published in November 2020, after advice on revisions to codes in light of COVID-19 mitigations was produced. Over 75 per cent of institutions submitted changes to codes on this basis.

Recommendations

- Consider whether further communication is required around changes made to the final guidance.
- Where confirmation is required that codes are compliant with the wider guidance, consider a dual-review process to bring in additional technical expertise.
- In line with EDAP's recommendation, provide further guidance to institutions on EIAs.

206. Each institution participating in REF 2021 was required to develop, document and apply a code of practice on key submission processes. In line with precedent from previous exercises, this was intended to support institutions in promoting equality, complying with legislation and avoiding discrimination in preparing submissions for REF. Codes of practice were also one of the measures through

which the funding bodies sought to promote equality and diversity in research careers and meet their own statutory obligations.

207. The processes to be covered by the codes were expanded from the REF 2014 guidance, in recognition of the changes made to submitting staff and outputs, seeking to encourage the fair representation of research in the exercise by all researchers within a given institution. All codes therefore covered the processes for determining who is an independent researcher and the selection of outputs in the HEI's REF submissions. Those institutions not submitting 100 per cent of Category A eligible staff also covered the criteria and processes for identifying staff with significant responsibility for research (SRR).
208. Following the publication of final 'Guidance on codes of practice' (REF 2019/03)⁴³ in January 2019, the REF team wrote to institutions in February 2019 inviting the submission of the codes of practice. Informed by learning from 2014 on the challenges of having two review rounds of the codes, we set a single deadline of 7 June 2019 for the submission of all codes. We used an online survey tool to collect the codes from institutions, which allowed more efficient tracking and management of submissions than an email-based method.
209. Following submission, EDAP examined the codes in a single review round and advised the funding bodies on their adherence to the published guidance. This review process was a significant task, as many codes were very substantial in length and it required a detailed understanding of the changes made to the submission of staff and outputs. For example, as indicated in paragraph 158, there were particular issues encountered in reviewing processes for identification of SRR. Several institutions used two-stage processes to identify which of their eligible staff had SRR. This often included identifying SRR on the basis of membership of research centres or groups, or through designated 'pathways' within the institution, with bespoke criteria first applied to determine membership or pathway. While SRR itself could not be based on what staff had achieved, institutions were of course free to use their own criteria to identify which of their staff would have research as an employment expectation. In some cases, however, SRR processes directly included output quality/volume, or the distinction between the two stages was difficult to determine. This resulted in a proportion of codes requiring revision before funding body approval could be given.

⁴³ 'Guidance on Codes of practice' (2019), available at www.ref.ac.uk under 'Publications and reports'.

210. The review process was completed successfully, with comprehensive advice across the set of submitted codes provided to the funding bodies in line with the published timescales. Informed by this advice, the funding bodies contacted their respective institutions to confirm approval or to request revisions. Institutions had an opportunity to revise their code of practice, where necessary. Each funding body had provided a common detailed timeline for the revision process to their institutions alongside the invitation to submit codes in February 2019.
211. The majority of codes were judged to adhere to the guidance following this preliminary review – although a large proportion of these required amendment in relation to a minor omission. It was clear that some of these minor omissions related to changes made to the guidance post-consultation, published early in 2019. Following publication of the final guidance, in February 2019 the REF team ran some workshops and webinars for institutions to support them in developing their codes of practice. However, for future exercises, the funding bodies may wish to consider further ways to underline any changes made at a similar stage.
212. To support those institutions where more substantial revisions were required, the REF team worked with the EDAP chair to produce a webinar focusing on those areas institutions might find useful as they amended or revised their codes. This included staff eligibility, significant responsibility for research, research independence, and staff circumstances. EDAP's report sets out more information about the commonly-observed omissions, and the further areas where codes fell short of the guidance and required revision before approval. All codes were eventually approved by the respective funding body.
213. EDAP was impressed by the overall quality of the codes and observed notable examples of good practice alongside practices in need of improvement. These reflections are set out in a detailed report by the panel published in November 2020⁴⁴. The review of codes continued to be a beneficial exercise; it led to clear improvements to codes in some aspects and provided the funding bodies with assurance that all institutions had a satisfactory code in place prior to submissions. Nonetheless, the review of codes of practice for REF 2021 included a more significant role in reviewing compliance with the wider guidance than previously, for example on processes for identifying significant responsibility

⁴⁴ 'REF 2021 Equality and Diversity Advisory Panel: Codes of Practice in REF 2021' (2020). Available at www.ref.ac.uk, under 'Publications and reports'.

alongside consideration of the documented processes from an EDI perspective. This required in-depth assessment processes from EDAP, some of which fell outside of the panel's remit in view of its primary role to advise the funding bodies and REF team on the measures to promote equality and diversity in the exercise. The funding bodies should therefore consider whether a dual-review process may be required in future to bring in additional technical expertise, where confirmation that codes are compliant with the wider guidance is still required.

214. We had intended to publish approved codes on the REF website at the end of 2019. However, we encountered some delays to this, due to the review process for the late entrant (see paragraph 202), the technical preparation of the codes for the website, and some early requests from institutions to approve changes to previously agreed codes. Just as we were ready to publish these in March 2020, the exercise was put on hold due to COVID-19. Anticipating a widespread need for institutions to make changes to the processes detailed in their codes (particularly around the timeframes), the REF Steering Group agreed that the publication of the codes should be paused. Following the development of COVID-19 mitigations – including guidance on changes to codes of practice (see paragraph 215) – and the resubmission of these by institutions, the codes were then published on the REF website in November 2020.
215. The 'Guidance on revisions to REF 2021' (REF 2020/02)⁴⁵ provided guidance to institutions on what to do where the delay to REF due to COVID-19 affected the processes documented in codes of practice. Drawing on an existing process for making minor or major changes to codes following their initial approval, the guidance instructed institutions that the process for making 'minor' changes could be followed where timescales had been wholly shifted to account for the delays (where further detailed conditions were also met). Where the conditions were not met, or there were wider changes that would usually be considered major, the procedure for making major changes still applied. Prior to the emergence of COVID-19, approximately 10 per cent of institutions submitted changes to their codes. In view of the impact of COVID-19, following publication of the mitigations in July 2020, over 75 per cent of institutions submitted changes, with a broadly even split between major and minor ones. These revised versions were incorporated into the set for publication in November 2020.

⁴⁵ See www.ref.ac.uk under 'Publications and reports'.

216. The 'Guidance on codes of practice' also set out the requirement for institutions to conduct an equality impact assessment (EIA) on the submission processes documented in the code of practice. These needed to be updated at key stages of the submission process, with the final version provided to the REF team after the submission deadline. The purpose of collecting these was to assist with evaluating the overall effectiveness of the equality and diversity aspects of the REF at sector level – and not for individual institutional assessment. Institutions were also required to submit a report reflecting on their experience of supporting staff with equality-related circumstances, with these also intended to support sector-wide analysis. Further guidance on both of these documents, including a template for the staff circumstances report, were provided to institutions in February 2020 in the 'Invitation to submit'.
217. The deadline for submitting EIAs and the staff circumstances report, alongside a final version of the code of practice, was pushed back to July 2021 in light of the delay to the exercise due to the COVID-19 pandemic. The REF team collected the submissions via an online survey tool.
218. The EIAs and reports were reviewed by EDAP, with findings and recommendations arising from this set out in the panel's final report⁴⁶. The information collected in the staff circumstances reports provided useful and timely feedback from institutions on the circumstances process, enabling EDAP to draw clear conclusions and support wider recommendations in this area. However, the considerable variance observed in the quality of the EIAs returned limited the extent to which the panel could draw sector-wide conclusions, leading EDAP to recommend that further guidance is provided to institutions on EIAs in future.
219. During the submission phase, the funding bodies received a small number of complaints from individuals alleging that their institution's code of practice was not in line with the REF guidance – typically in relation to identifying staff with significant responsibility for research. In these cases, the documented processes in the codes did not contravene the guidance, but across many codes the information set out did not include full detail on the operational implementation of processes. Regarding these complaints, each relevant funding body engaged in

⁴⁶ 'Equality and Diversity Advisory Panel final report' (2022), p. 14. Available at www.ref.ac.uk, under 'Publications and reports'.

a discussion with their institution(s) to remind them about the requirements of the guidance, and to explore whether an amended code needed to be returned.

220. In the context of the changes to staff submission in REF 2021, the funding bodies committed to putting in place measures to provide reassurance that the processes documented in codes of practice were being adhered to. The Code of Practice Complaints and Investigations (C&I) process was set up to fulfil this purpose, enabling individuals to make a formal complaint where it was believed that a code's processes were not being followed.

221. The C&I process was primarily focused on handling complaints received during the exercise itself; no in-scope complaints were received in this period. The process also set out a provision for individuals to raise a complaint following publication of results and submissions. A small number of complaints were received after the publication of results. The outcomes from this process are detailed in a separate report⁴⁷.

5.3 Advance review of staff circumstances

Key points

- Institutions could submit requests for output reductions on the basis of staff circumstances in advance of the submission deadline. Overall, the advance review process worked well.
- EDAP's review of the advance requests continued during the period the REF was on hold, although the effects of COVID-19 extended the overall timetable for the review.
- The advice on outcomes and EDAP's interim report provided additional clarity for institutions on the requirements, leading to very few reductions that were not accepted during the main assessment year.

Recommendations

- Where an advance review process takes places, consider earlier development of software to support the assessment processes.
- Factor into requirements that technical resource may be required for some processes (e.g. bulk audit queries) using a ticketing system in future.

222. In REF 2021 institutions were invited to submit requests for output reductions on the basis of equality-related staff circumstances in advance of the submission deadline. This was intended to address concerns raised by institutions about the

⁴⁷ The report on the REF Codes of practice complaints and investigations process is available at www.ref.ac.uk under 'About the REF'.

risk pertaining to submitting staff circumstances reductions in REF 2014, and thereby better support equality and diversity in the exercise. Having the requests agreed in advance, following review by EDAP, would give greater confidence to institutions in applying reductions.

223. Given the separation of staff circumstances, and individual output requirements, from staff in the decoupled submission model for REF 2021, a new REF form (REF6a/b) was developed for the collection of circumstances data.
224. Following the description of the general approach to submitting circumstances in the 'Guidance on submissions', in September 2019 we sent out detailed instructions to institutions on making their requests in the 'Invitation to submit staff circumstances requests'⁴⁸. The deadline for submitting requests was 6 March 2020 and we expected to provide the outcomes to institutions prior to the census date in July. To provide extra support to institutions in how to submit requests and what information should be included, the REF team and chair of EDAP recorded a webinar and published a set of example submissions on the REF website.
225. Requests were submitted by 6 March deadline using the online REF submission system, from 58 per cent of institutions participating in the exercise. However, the next stage of the review process was then impacted by the COVID-19 pandemic and the developing contingency measures being considered for REF. In light of the delay to the REF announced in late March, the REF Steering Group considered which aspects of the exercise should continue, and agreed that the scheduled REF6 review activity should proceed but remain under review.
226. While it was agreed that the review would continue during the pause period, the assessment process needed to move to a virtual format and the overall timetable was extended. This was in response to the effects of the COVID-19 pandemic and the related restrictions on EDAP members, as well as to ensure institutions were not required to respond to any requests for further information on REF6 until the exercise had restarted. When the new REF submission deadline was confirmed in June 2020, we wrote to our REF6 contacts to confirm the new timeline of September 2020 for providing outcomes on the reduction requests.

⁴⁸ The 'Invitation to submit staff circumstances reduction requests' is available at www.ref.ac.uk, under 'Publications and reports'.

227. After completing the review process, EDAP produced an interim report that described the panel's processes and findings⁴⁹. The report included summary data on the submitted requests, points of good practice and common areas where the guidance was incorrectly applied. It also described the panel's approach to assessing 'disproportionality' for the unit reduction requests (REF6b). This feedback provided more clarity for universities around when a unit reduction might be applied, helping to inform decisions about applying output reductions at the final submission deadline in March 2021.
228. As described in EDAP's interim report, further information was required in a number of cases before EDAP was able to make a judgement – particularly for requests for the minimum of one reduction (REF6a), where this was required for 34 per cent of submitted cases. Our intention with the circumstances measures in REF 2021 had been to reduce the amount of detailed personal information collected in comparison with that submitted in the previous exercise. The communications activities described above (including the webinar and worked examples) were intended to demonstrate the level of information that would be required. However, for REF6a in particular, this guidance was not always closely followed, with some evidence suggesting that the requirements were not always fully understood. We sought to address this through our subsequent communications to institutions, including the outcome letters, EDAP's report and through the provision of FAQs.
229. Overall, the advance review process worked well and institutions received the outcomes in line with the revised schedule in September via the submissions system. Institutions were able to appeal the outcomes on the basis of perceived irregularities in the processes followed in determining reductions or incorrect application of guidance. One appeal was heard by a panel comprising members of the four funding bodies, where no evidence of procedural irregularity was identified. The outcomes and EDAP's interim report provided additional clarity for institutions on the requirements and led to very few reductions that were not accepted during the main assessment year (where 97 per cent of REF6a and 100 per cent of the cases for a REF6b unit reduction were approved, compared with 83 and 88 per cent respectively in the advance process).

⁴⁹ 'REF 2021 Equality and Diversity Advisory Panel Interim Report' (2020), available at www.ref.ac.uk, under 'Publications and reports'.

230. There were some particular challenges with running the process in advance, however. One of these related to the assessment of disproportionality on which EDAP needed to make a judgement for the REF6b unit reduction requests. This judgement incorporated reference to the total unit size that, in advance of submissions being made, needed to be based on data obtained through the survey of submission intentions.
231. A further issue related to the return of incorrect HESA identifiers for staff by several institutions, given the early stage in the submission process, which later required the REF team to develop a new process and proforma for institutions to submit corrections to the HESA data they had returned in March 2020. We made adjustments to the HESA identifiers for 41 members of staff from 18 different institutions in total.
232. As indicated in Section 4.4, the guidance around applying previously reviewed, amended and new reductions at the submissions deadline was quite complex, as was the process for developing the submission system for this purpose. Advance reviewed reductions were optional to apply by the submitting institution, needed to incorporate the outcomes of EDAP's review process, and needed flexibility for institutions to be able to edit all or part of what had been previously submitted. These system requirements needed to be incorporated into the existing REF6 forms in the user interface of the submission system, as well as in the import functionality. The forms also needed linking with the REF1 staff details forms and the output counting algorithm that underpinned the software, to ensure the unit output requirement was calculated correctly. This development work was complete and the forms unlocked for editing in November 2020, when we sent out an updated 'Invitation to submit' with detailed annexes supporting the application of reductions for REF6.

5.3.1 Administration of the process

233. To support the administration of the review processes, the REF team drew on some of the early software in development for the assessment phase. This included use of the Panel Members' Website to confidentially share with EDAP members, and collate from them, individual assessment data; and using the backend functionality of the assessment system to support the integration of assessment data from multiple panel members, which was in development for the main assessment phase although did not yet have a user interface.

234. The use of this developing software enhanced the efficiency and accuracy of the processes managed by the panel secretary (resourced from within the REF team); however, the early stage of development meant there were no user interfaces. Its successful operation partly relied on having the REF development team embedded within the wider team, supporting quick and straightforward communication around any issues. If the secretary role is resourced through a secondee role in future, and if an advance process is maintained, earlier development activity will be required to support the assessment processes.
235. The team also drew on the REF audit ticketing system to manage the requests for further information from the institutions. This worked well, although raising bulk audit queries required technical support from the REF development team, which should be factored into requirements where using a ticketing system in future. In addition to the further information required to inform EDAP's judgements, these requests also included a sample of REF6b 'defined' reductions to allow EDAP to review the correct application of the tariffs.

5.4 Submission system

Key points

- The REF submission system was developed in-house following an agile approach, and was hosted using a Platform as a Service (PaaS) cloud infrastructure. Oversight of the development was provided by an external Data Collection Steering Group.
- The PaaS provided the submission system with various disaster recovery mechanisms, such as data mirroring and automatic failover within the hosting data centre.
- Security testing showed the overall security posture of the REF submissions service was at an excellent level.
- The agile approach allowed early release of the beta version of the submission system to institutions in April 2019; however, development progress encountered some delays due to recruitment issues and additional requirements. The official launch of the system in February 2020 allowed universities to enter data in all REF submission forms.
- The COVID-19 mitigations introduced in 2020 and early 2021 introduced additional requirements for the submission system software. This had a knock-on effect on the development of the assessment systems and for our retrieval of output PDFs from publishers.
- We provided email and telephone user support for the submission system; over 2,000 tickets were received during the submissions phase.

Recommendations

- Load test the submission system prior to peak usage, and maintain closer monitoring of performance to scale resource as required when the system is in regular use.
- Consider appointing specified development resource for the assessment systems, alongside that for the submissions software.
- Consider scheduling a longer period between the receipt of submissions and the start of assessment phase, to allow more time for data transition to take place across the systems.

5.4.1 Development approach

236. In previous exercises, the former Higher Education Funding Council for England (HEFCE) built and supported the several systems required for the collection and assessment of data in the REF (and RAE before it). Due to the upcoming organisational change in April 2018, whereby HEFCE's research and knowledge exchange functions would transition to Research England (RE) (as part of UKRI), there needed to be an early exploration of how the systems would be delivered for REF 2021. In early 2017, we commissioned work to undertake an options analysis. This included continued in-house development (within UKRI),

contracting out the development (including where 'off-the-shelf' products may be applicable), and hybrid options across these.

237. Informed by the analysis, we agreed that an 'ownership' model continued to present the best option, although with the systems to be hosted in the cloud rather than on HEFCE's servers. It also informed initial decisions on IT staff recruitment, with three posts identified for the core REF IT Team (lead developer, software developer and systems tester / user support manager). Development work commenced in HEFCE, with the aim that new staff recruited would be able to draw on HEFCE staff with previous experience. Thereafter, the REF development staff transitioned across to RE. Initially, development work was supported by a Technical Working Group, comprising colleagues from across Research England and the Office for Students, with expertise in data analysis and IT development. Several members also had significant previous REF / RAE experience. However, some of the key risks around loss of experience in this model were mitigated at an early stage through the appointment of the key architect in previous REF/RAE development to the lead developer role for REF 2021.
238. The development model we followed embedded the development team much more closely within the wider REF team than in previous exercises, particularly following transition to RE. This proved a successful and responsive approach to development (particularly during the COVID-19 pandemic). However, the REF staff were the only technical resource employed within RE, and there were some disadvantages in not having the additional technical resource readily available that comes from being embedded in a wider organisational IT group.
239. The REF systems were developed following the agile approach. The benefits of an agile approach mean that functionality can be released iteratively to meet business and user needs. The robust release process that comes with an agile framework meant that issues and defects could be addressed quickly and delivered into the live system. It also allows for rapid changes in priorities to cater for competing demands. We worked with the Government Digital Service to get approval for each phase of development. To support the agile approach, early in the project core members of the REF policy and administration team joined the development team in agile training, following which core members were assigned as 'product owners' for different aspects of the systems development.

240. An external Data Collection Steering Group (DCSG) was established to provide oversight of the development of the system. The group's remit included ensuring that all required data could be collected from institutions, that the data would be processed and managed effectively, and could be made accessible to the REF panels. The group also supported the integration of citation data from suppliers within the REF data collection system.
241. DCSG included members with detailed knowledge and experience of research administration or information systems from a number of institutions representing the different types of HEIs that would be submitting to the REF, as well as representation from HESA, JISC and UKRI⁵⁰. The group also included a representative of the funding bodies, which provided a direct reporting link to the REF Steering Group. The input they provided was very important in ensuring the project met institutions' needs and was planned, delivered and tested effectively. DCSG met eight times during the REF project.
242. To specify the user requirements for the submission system we drew on several sources in our user research. This started with feedback on the 2014 system – both that gathered at the end of the exercise, and through discussion of user requirements with DCSG and early engagement with our REF 2021 secretariat and REF contacts. This was followed with a survey of our REF technical contacts in mid-2018.
243. Early iterations of the submission system were presented at national briefing events where the system was demonstrated and the development team could respond to feedback and questions. Smaller user workshops were also held to test out designs and prototypes of more complex features (for example REF6). These were invaluable in guiding the direction of development. We also held workshops with suppliers of current research information systems (CRIS) to institutions, to support complementary development of the services they would be providing for REF submissions within their products.
244. Early in the software development process, a testing strategy was developed, covering the planned approach to automated, manual, regression and security testing. The agile approach we followed enabled testing to begin and continue alongside development, meaning that the iterations delivered by the team had been tested in the small incremental functions that were developed. The

⁵⁰ The membership is published at www.ref.ac.uk, under 'About the REF'.

capability to continuously test through this approach meant that the team rarely had a large testing and defects backlog, as was experienced in REF 2014.

Automated testing was built into the deployment and release process to ensure robustness. Scripted and unscripted testing was undertaken by the team during these iterations.

245. The development team delivered a test version of the submission system, which was available to all institutions and CRIS suppliers. This enabled them to undertake user testing at their own institutions. Many used the test environment to train users at their own institutions, and it gave them an opportunity to try out and feedback to the team on new features.
246. The agile approach allowed early release of the beta version of the submission system to institutions in April 2019, which delivered the functionality for multiple submission and small unit exception requests, and for requests to submit case studies requiring security clearance. This release also delivered the first version of the admin system, which is the tool we used to invite all the institutions to register for the submission system. The admin tool was an additional development need for REF 2021, due to the new architecture of the systems. It allowed us to manage institutions' contact details, and technical and institutional contacts. There were very few support calls during this period and all institutions registered and submitted special requests by the deadlines.
247. However, development progress encountered some delays both due to difficulty in recruiting the planned additional developer resource and the introduction of some additional requirements. Options analysis for development and data collection around some of the more detailed aspects of the project, including the survey of submission intentions, the admin tool and institutional requests (for multiple submissions, REF6 reductions and so on), were not included in the preliminary systems work and was instead undertaken later on in the project. The transition to RE precluded our re-use of previous HEFCE tools for supporting these aspects of the process, and we therefore concluded the submissions system itself would provide the most appropriate and secure approach.

5.1.1 Systems pilot and official launch

248. In October 2019, on schedule, we launched a pilot of the submissions system with the release of the latest version of the software. This included the staff circumstances reduction request forms (REF6a/b), and the launch of the survey of

submission intentions, as well as new import functions. However, due to the delays noted above, this did not yet include all system functionality. The official launch of the system in February 2020 allowed universities to enter data in all REF submission forms and included updates in response to the survey feedback provided by institutions at the end of the pilot phase of the software (see paragraph 249). Further releases continued to be made on a monthly basis to deliver the remaining areas of functionality, with a published timetable setting out when each aspect was due for release. However, further releases were then subsequently required for the COVID-19 mitigations.

249. Alongside the November 2019 release, we circulated a short user survey to gain feedback on the system pilot from the user community. Despite extending the deadline, we received only a small number of responses, although these helped us to identify areas for attention – including closer monitoring of system performance, additional areas where more guidance was required, and improving the quality of the system guidance.
250. In October 2019, the REF development team engaged a third-party supplier to undertake penetration testing on the submission system, to ensure it was safeguarded against malicious attacks. This work identified that the overall security posture of the REF submissions service is at an excellent level, with the main recommendation being to ensure the high security standard of development was maintained. The testing included a phishing test exercise with submitting institutions, which highlighted a need for the REF team to make clearer how digital information will be presented and disseminated to the REF community. In early 2020, therefore, we produced 'Technical security user guidance', which described how the REF team would communicate electronically⁵¹.
251. The submission system was hosted on a Platform as a Service (PaaS) cloud infrastructure. This allowed for the dynamic scaling up and down of the services depending on demand, meaning we could monitor and 'upgrade' the resources running the service as demand increased. To ensure resource intensive tasks such as import and export did not adversely affect users, these tasks were queued.

⁵¹ The 'Technical security user guidance' and the 'Penetration Testing Report' are available at www.ref.ac.uk, under '[System security](#)'.

252. To manage the overall budget, we aimed to scale the system resources proportionately; there were points during high-demand periods, however, where users encountered some performance issues before the scaling up was implemented (as indicated in the feedback survey). This in part was related to ongoing learning within the development team about how the monitoring related to the user experience, and might have been further supported by load testing to help understand the resource scale required for the expected load and identify any issues causing performance loss. Drawing on these experiences we were able to load test in advance of launching the results systems, which helped ensure high and consistent performance. In response to the issues encountered with the submissions system, we monitored performance more closely in reaction to user feedback, upscaling as required, and published weekly performance reports on the submission system. In future, the funding bodies should ensure there is sufficient resource to load test the system prior to peak usage and maintain close monitoring of performance when the system is in regular use.
253. The PaaS provided the submission system with various disaster recovery mechanisms, such as data mirroring and automatic failover within the hosting data centre. To reduce the risk to the data further, the data was also mirrored to a second data centre provided by the same supplier. Also, database backups were taken at regular intervals and stored for up to 30 days within both data centres.

5.4.2 COVID-19 mitigations

254. The mitigations that were introduced into the framework in response to COVID-19, in both July 2020 and January 2021, had implications for the submission system software. This included additional functionality to add COVID-19 statements across all three elements of submissions; deactivating the functionality for pending publications; validation changes to account for delayed outputs; making optional the upfront provision of impact corroborating evidence, and missing narrative templates with an agreed extension; and functionality to allow edit and submit of narrative templates after the submission deadline. The close integration of the REF development team within the wider team enabled the system implications to be considered closely alongside the development of the mitigations, and for implementation to be rapidly prioritised when decisions had been confirmed.
255. The additional development work, particularly at the late stage of the January 2021 mitigations, however, had a knock-on effect on the development of the

systems for the panels' assessment given the fixed size of the REF development team. Planning and design of the assessment systems were also impacted by the shift in focus of the policy team to the consultations on the mitigations.

256. It might have been feasible to draw on wider organisational technical resource to support this stage of the project, had the REF development team been situated within that context – as had happened within HEFCE in previous exercises. There were significantly greater challenges in seeking to address this via additional appointments, however. In addition to the general challenges we had experienced around technical recruitment, this included the time taken for the recruitment process, onboarding and training, and the overhead of the current team to be involved in these processes, which was infeasible to balance with the workload during this period. To mitigate such risks to assessment system development in future, the funding bodies should consider building in specified development resource, which could commence alongside development of the submissions software. It may also be advisable to consider scheduling in a longer period between the receipt of submissions and the start of assessment phase to allow for data transition to take place across the systems.

257. The effects of COVID-19 also had implications for our retrieval of output PDFs from publishers. One major issue encountered was where access to our retrievers was shut off in line with original licence agreements, which ran only until the end of December 2020. Further technical issues were encountered in retrieving PDFs from elsewhere, including where some publisher sites restricted the number of PDFs that could be downloaded in a given time period. As noted above, the resource constraints arising from the additional development work for the COVID-19 mitigations meant we were not able to implement code to check PDF downloads as they were retrieved. These issues therefore resulted in the failed retrieval of several thousand output PDFs, which required significant manual work to identify and re-retrieve when access had been renegotiated or other technical issues resolved.

5.4.3 Guidance and user support

258. We aimed to recruit a technical author to produce a comprehensive user guide for the submission system. However, we were not successful in recruiting for this as a fixed-term post. We instead resourced this through a contractor for a shorter period than initially planned, with the primary task for them being to set up the appropriate software, core user guide and contextual help in a way that meant it

could then be handed back over to resource within the REF development team. The guide was built into the submission system, cross-referring to the 'Guidance on submissions' and 'Panel criteria' documents where appropriate, and was also available as a stand-alone document available on the REF website. The contractor had reached the end of their post by the time the mitigations due to COVID-19 were introduced, at which point the user guide was updated by core members of the REF development team.

259. Email and telephone user support for the submission system was provided initially by two dedicated user-support team members. The majority of queries were handled through the user support ticket system. Through this system, over 2,000 tickets were received during the submissions phase with volume of queries generally increasing per month on the approach to the submission deadline, reaching a peak of 694 tickets in March 2021. This also included some queries from panel members as we began to rollout the webmail communication system. In total, 97 per cent of tickets were responded to within 24 hours, with nearly half responded to within 2 hours. 'Manual data entry' was by far the most commonly raised issue in relation to the submission system. In terms of issue complexity, nearly half of queries were resolved in one email, but 18 per cent took 6 or more emails to resolve.

260. In addition to the user guide and dedicated support team, a range of supplementary information was provided to support institutions. This included further information on the submission system section of the REF website, user video guides and FAQs . The video guides included ones for the submit process, including a specific video for joint submissions. These proved a successful method for providing additional support, with very few support queries on the submit process received.

5.5 Submissions phase institutional request processes

Key points

- Institutions were invited to make requests for multiple submissions, small unit exceptions and case studies requiring security clearance in April 2019.
- A total of 25 multiple submission requests were made (for a total of 50 submissions) from 19 institutions. Only one request was not accepted. In the event, 16 institutions made 42 multiple submissions in total.
- We received a total of 111 requests for small unit exceptions, although a number of these were withdrawn after clarification of guidance. Around 70 per cent of requests were approved.
- The review process for small unit exceptions showed the purpose of this new measure had not always been widely understood and the information requirements did not routinely provide the level of detail needed to inform decisions.
- A total of 83 requests were made to submit classified impact case studies, and 15 requests were made to submit classified outputs. Around 15 per cent of the case study requests were either subsequently withdrawn or not approved. In the event, 34 classified impact case studies and 10 classified outputs were submitted.
- The review process showed there had not always been consistency in the level of clearance HEIs requested and that which was then required for access to impact case studies. Additionally, the process for identifying suitably-cleared assessors was not straightforward.
- Later on in the submission phase, an additional process was introduced allowing units that had been affected by major unforeseen events in the assessment period to request output reductions.
- Four requests were received from three institutions. All requests were approved, although in some cases this included a different output reduction than originally requested. The review process was reasonably straightforward and proportionate to the volume of requests made.

Recommendations

- Where setting up any new request-based processes, provide additional clarification to support institutions' submissions and consider whether a short pilot or test run of the information requirements is required to ensure the guidance is as detailed and clear as possible.
- Ensure that each main panel appoints at least two members with appropriate security clearance for the type of classified items likely to be submitted in their relevant sub-panels.
- Working with relevant government colleagues, consider providing guidance to institutions on different classification levels and how items with different classification levels should be sent for assessment.

Ensure senior resource with suitable clearance is available in the REF team.

5.5.1 Multiple submission requests

261. Institutions were able to request permission from the REF director to make multiple submissions in a UOA. Requests could be made where they fulfilled one of the following criteria:

- an institution involved in a joint submission wishes to make an additional individual submission in the same UOA
- for Sub-panel 26, where one submission is in Celtic Studies and the other is in Modern Languages and Linguistics
- where HEIs had merged after 1 July 2018, and wish to make two separate submissions in all of the UOAs in which they plan to submit
- where a sub-panel considered there is a case for multiple submissions, given the nature of the disciplines covered.

262. Institutions were invited to make submissions in April 2019⁵². To suit their internal decision-making processes, they were given a choice of three deadlines in May, September and December 2019, and were required to submit all requests at once. Requests needed to be submitted via a webform on the submission system. A template of the webform was provided to support institutions to gather the information required.

263. Each multiple submission request was reviewed by a REF team member and the REF director, and a recommended outcome was then proposed to the relevant sub-panel chair for agreement (or deputy chair where there was a conflict of

⁵² See the 'Invitation to make requests for multiple submissions, exception from submission for small units and for impact case studies requiring security clearance' (2019) available at www.ref.ac.uk under 'Publications and reports'.

interest). As an additional step to support consistency in decision making, advice was also sought from the relevant main panel chair. The decisions were made by the REF director on the advice of the main and sub-panel chairs. Decisions were typically communicated to the HEI within six weeks of each deadline, including proposed submission names where multiple submissions were agreed. There was sometimes a request for further information, prior to being able to confirm a final decision.

264. A total of 25 multiple submission requests were made across the three deadlines (for a total of 50 submissions), from 19 institutions. Only one request was not accepted. In the event, 16 institutions made 42 multiple submissions in total. These figures show a considerable reduction in the number of requests compared with REF 2014, where 76 multiple submission requests were received (for 158 submissions), 75 requests were accepted and 129 multiple submissions were then made.

265. Requests were made across 9 UOAs, with UOA 33 (Music, Drama, Dance, Performing Arts, Film and Screen Studies) receiving the most requests. Of the 25 requests, 22 were made on the basis of the nature of the disciplines covered. The vast majority of these were requested in the UOAs where the sub-panel had indicated requests would be considered. Two requests were made on the basis of Celtic Studies, with a further one request on the basis of a joint submission also being made.

5.5.2 Small Unit Exception requests

266. In REF 2021 a new measure was introduced allowing institutions to request permission from the REF director for an exception from submitting very small units. This sought to recognise that the requirement to submit all staff with significant responsibility for research may bring in scope for submission an individual staff member, or very small group of staff, whose research focus was academically distinct from other units within the submitting institution.

267. Requests could be made for an exception from submission where the combined FTE of staff employed with significant responsibility for research in the unit was lower than five FTE, and where the research focus of these staff:

- fell within the scope of one UOA
- was clearly academically distinct from other submitting units in the institution

- the environment for supporting research and enabling impact of each proposed submitted unit was clearly separate and distinct from other submitting units in the institution.

268. Institutions were invited to make requests in April 2019, alongside multiple submissions, and were offered the same three deadlines to select when making these. Requests were collected via a webform on the submission system, with a template provided to support the internal gathering of information beforehand.

269. Each small unit exception request was reviewed by a REF team member and the REF director, and a recommended outcome was then proposed to the relevant sub-panel chair for agreement (or deputy chair where there was a conflict of interest). As an additional step to support consistency in decision making, advice was also sought from the relevant main panel chair and the chair of the REF Steering Group. The decisions were made by the REF director on the advice of the main and sub-panel chairs. In a very high number of cases, the first communication back to institutions was a request for further information. While these requests were typically made within six weeks, consideration of the returned information then required additional time and, in some cases, a second request for additional information was required. Because of the overall volume of requests requiring further information, with each set of information returned needing to be reviewed by the REF director and panel chairs, the process for reviewing the exception requests was challenging to manage. Furthermore, feedback on requests that were submitted in December 2019 was then delayed by the effects of COVID-19 on the overall timetable.

270. We received a total of 111 requests across the three deadlines, although a number of these were withdrawn, typically following further clarification on the purpose of the exceptions from the REF team. Requests proceeding to full review were made by 47 institutions and these covered nearly all UOAs, with UOA 23 (Education) receiving the most. The majority of institutions requested an exception in one or two UOAs; a small number made several requests, with the most being eight. Around 70 per cent of requests were approved; the most common reasons requests were not approved was because a unit did not meet the criteria of being clearly academically distinct from other units and/or having a separate and distinct environment, or the information provided was not sufficient to determine whether the request met the criteria after two opportunities to submit further information had been provided.

271. Institutions were able to appeal the decision where a small unit exception request was not approved, on process grounds or on the basis of new information. Two appeals were received and were considered by an independent panel comprising members of the REF Steering Group.
272. The review process for small unit exceptions – including the number requiring additional information and the overall proportion not approved – highlighted that the purpose of this new measure had not always been widely understood and that the information requirements did not routinely provide the level of detail needed to inform decisions. In some cases, requests were linked more to individual institutions' submission strategies and the fit (or not) of some research areas within this. For example, where the research of some but not all staff within a department or grouping aligned with that of a unit planned for return, and so a case was made for an exception from submission for the remaining staff. These cases typically were not considered to meet the guidance unless very clear evidence was provided on how the research focus and environment of the remaining staff was distinct from that of the wider department/group.
273. With hindsight, it is clear that more context on the reason for the measure should have been set out in the 'Guidance on submissions', along with more detailed guidance on the information required to assess requests – although to some extent, the requirements only became fully evident through the review process. In future exercises, where setting up any new request processes such as this, the funding bodies should provide additional clarification to support institutions' submissions and consider whether a short pilot or test run of the information requirements is required to ensure the guidance is as detailed and clear as possible.

5.5.3 Requests for items requiring security clearance

274. In recognition of the fact that some impact case studies contain sensitive material that could only be made available for assessment to individuals with national security vetting, institutions were able to make requests to submit such classified impact case studies. Requests were invited in April 2019 (see paragraph 262) and required approval from the REF Director with advice from the sub-panel chair, with full approval pending identification by the REF team of assessors with suitable security clearance. Institutions were asked to indicate the level of security clearance required for each item and whether the clearance necessary

pertained to the impact case study narrative and/or the underpinning research or corroborating evidence.

275. Following our April invitation to submit requests, we received queries in relation to whether the same provision applied to outputs requiring security clearance. These were permitted according to the same process, as clarified through an FAQ in autumn 2019, with any requests for submission of these items to be made by the final December deadline for impact requests.
276. A total of 83 requests were made to submit classified impact case studies, and 15 requests were made to submit classified outputs. Around 10 per cent of the case study requests were subsequently withdrawn and around 5 per cent were not approved, typically where it was determined that security clearance would not in fact be required to review the item. The remainder were approved, although a significant proportion of these were approved pending the identification of a suitable assessor. In the event, 34 classified impact case studies and 10 classified outputs were submitted. Appropriate assessors were found for all items.
277. The REF team worked closely with colleagues in the Department for Business, Energy and Industrial Strategy (BEIS) (now the Department for Science, Innovation and Technology (DSIT)), GoScience and the Office of the Chief Scientific Adviser (OCSA) to identify assessors with appropriate security clearance for the impact case studies and outputs HEIs requested to submit. Where possible, appropriately security cleared panel members and assessors were identified, with external assessors being identified where no existing panel members or assessors were appropriately security cleared. This work was put on hold in 2020, as colleagues with whom the REF team were working were reassigned to other priorities in response to COVID-19; it resumed again in autumn 2020. The REF team also worked closely with BEIS, GoScience and OCSA to arrange access to classified items for the assessors.
278. The process for identifying suitably-cleared assessors was not straightforward and in some cases drawing on individuals external to the sub-panel raised concerns related to calibration and assessment standards within the sub-panel. The REF team explored the possibility of seeking security clearance for sub-panel chairs to allow chairs to assess classified items. However, we were advised by OCSA that this was not possible, and it is unlikely to be possible for future exercises. To address some of these issues in future, the funding bodies should seek to ensure that each main panel appoints at least two members with

appropriate clearance for the type of classified items likely to be submitted in their relevant sub-panels, who could lead on assessing all classified items submitted to their sub-panels. Consideration should be given to likely conflicts of interest with submitting HEIs.

279. During the process of arranging assessors and access to items, it became apparent that there had not always been consistency in the level of clearance HEIs requested and then required for access to impact case studies. Often higher clearance had been requested initially by HEIs than was ultimately required for the version of the impact case study finally submitted to the exercise. In some cases, impact case studies that did not require security clearance to access them were submitted where the HEI had initially indicated that clearance would be required. In other cases, it was not always clear whether the classification pertained to the narrative, the underpinning research or the corroborating evidence. This lack of clarity is likely due to research offices within HEIs often not having security cleared officials who are able to fully appraise the information given to them by the authors of the case studies or who lacked guidance on security classifications, due to the time lag between the request to submit and submission, and due to HEIs wanting to ensure an appropriate assessor could be identified. In future, the funding bodies should consider providing guidance to institutions on different classification levels and how items with different classification levels should be sent for assessment. We recommend that the future REF team work closely with DSIT (formerly BEIS), GoScience and OCSA (and other relevant bodies) to provide such guidance to HEIs.
280. Well-established systems for handling OFFICIAL SENSITIVE material electronically and for checking the clearance of assessors within BEIS ensured smooth processes for many of the submitted items. Items with higher classification materials often required assessors to travel to specific locations for assessment. Ideally in future, the REF team would begin working with colleagues in DSIT, GoScience and OCSA earlier in the exercise to have processes for access in place earlier. This should include consideration of what additional information on classified case studies is collected from HEIs at the point of submission, to facilitate gaining access to the items. In order to better facilitate liaison with holders of classified impact case studies, and with GoScience and OCSA where necessary, consideration should be given to ensuring there is senior resource with suitable clearance available in the REF team.

5.5.4 Major unforeseen events

281. In response to feedback from several institutions, and drawing on precedent from the RAE, during the submission phase of REF 2021 we agreed a process whereby units that had been affected by major unforeseen events in the assessment period could request output reductions. We published the details of the 'major unforeseen events' process in an FAQ in late 2019. Under this provision, institutions were able to put forward a case to the REF Steering Group, setting out details of the event, the nature of the effect, and a calculation of how many outputs for which they were seeking a reduction (drawing on the staff circumstances tariffs relating to periods of absence). The steering group agreed to consider cases where there had been a major event affecting the submitting unit's research infrastructure or facilities that has consequently had a significant effect on the productivity of a large proportion of staff in the unit.
282. Institutions submitted requests by email – the guidance specified that no individual staff details should be included. The deadline for submitting requests had originally been scheduled for July 2020. In response to the delays to the overall timetable due to COVID-19, this was pushed back to November 2020.
283. Submitted requests were initially reviewed by the REF team and REF director, before advice was sought from the relevant main and sub-panel chairs. The steering group considered the requests and associated advice at a specially-convened meeting in December 2020, assessing each request on a case-by-case basis in line with the published guidance. This included consideration of any further information provided by the institution following the REF team's review.
284. Four requests were received from three institutions, relating to UOAs within Main Panels A and D. All requests were approved, although in some cases this included a different output reduction than originally requested, following the steering group's decision to apply a consistent approach to calculating reductions across all requests.
285. The reductions were optional for institutions to apply. Institutions with approved requests were invited to confirm the number of outputs, up to the maximum agreed by the steering group, by which they wished to reduce their total requirement. Once confirmed, the reduction was applied directly in the submission system, meaning the unit was then not able to submit more outputs than the total reduced number.

286. The review process was reasonably straightforward and proportionate to the volume of requests made. In planning for and operationalising the process, we were able to draw on our experience of reviewing the small unit exception requests – for example, in scheduling in time for any additional information and arranging for main and sub-panel chair input. Furthermore, setting a single deadline and holding a single review meeting supported consistency in the decision-making process.

5.6 Survey of submission intentions

Key points

- In late 2019, we ran an online survey to gather information on the anticipated volume and content of submissions, for planning purposes.
- We introduced key changes into the survey data collected in contrast to 2014. Some of these provided more helpful data; others showed some limitations.
- The survey data was helpful in informing decisions on where further panel appointments were needed for the assessment phase. At an exercise level, key survey data proved to be reasonably accurate.
- A high-level summary of the data was published in January 2020, including the estimated changes in FTE by main panel.

Recommendations

- Explore the feasibility of implementing pre-defined options for research specialisms in the survey software. This may require setting some uniform requirements around the data structure to inform engagement with the sub-panels.
- Give further consideration to the level of detail required around output types and formats in the survey to better inform planning. Further user research would be needed to determine the feasibility for HEIs in providing more detailed data.

287. The REF survey of submission intentions was an online survey to gather information on the anticipated volume and content of submissions, to enable the REF team and the REF panels to plan and prepare for the assessment phase of the exercise. The panels planned to use the information to assess the anticipated range and volume of material to be submitted, and to identify the expertise required for the assessment. The information provided was not binding, but we encouraged institutions to be as accurate as possible in view of its intended purpose.

288. The dataset we needed to collect through the survey was reasonably complex, with information required for each UOA and with multiple potential data entries

required across the different specialisms within each UOA. The data were therefore collected through the submission system, with the bespoke development able to cater to these requirements in a way that was more challenging for commercial survey tools. Specification and development of the survey began later in 2018, with initial user research focusing on the panels' requirements for the data.

289. One of the more challenging areas for the development was the implementation of the panels' requirements around the list of research specialisms for outputs that would be available for each UOA in the survey. In contrast to the previous exercise, a high proportion of sub-panels opted to use a bespoke list of specialisms (rather than asking HEIs to define the specialism, or draw on the relevant UOA descriptor). This was aimed at improving the quality and consistency of data returned, through provision of pre-defined options for each UOA. In the first instance, this involved extensive liaison with the sub-panel chairs in early 2019. However, there was quite a bit of variation in sub-panel preferences for how the data should be structured, which was not practicable to implement on a per-UOA basis in the software. Instead, a free-text box was provided in the web form alongside guidance for HEIs on the requirements of each panel. While this gave room for flexibility around each sub-panel's requirements, it did not deliver as well on the aims of improving data consistency and quality. In future, the funding bodies may wish to explore again the feasibility of implementing pre-defined options in the software. This may require setting some uniform requirements around the data structure to inform engagement with the sub-panels.
290. In mid-2019 we engaged with some representative groups in the sector to finalise the requirements for the development. This included defining the way that the volume of outputs in each specialism was going to be captured, seeking to balance feasibility for institutions (where there was still likely to be uncertainty around precise numbers) with the panels' data requirements. Following this user engagement, we confirmed the requirement as providing an estimate of outputs for each research specialism to the nearest 5, recognising that this may lead to some overestimation in the volume of outputs.
291. For the first time in the survey, we sought to capture the proportion of outputs by high-level output type. For the panels that were expecting a greater diversity of output types to be submitted, this information was of some use in supporting planning – for example, it provided an indication of the increase in books that we

saw submitted in some Main Panel D UOAs. However, as these were not linked to research specialism, the data could not be used in a detailed way for planning. We also did not capture the expected proportions of physical and electronic items that would be submitted. This led to the library shelving being slightly over-provisioned as the team had to plan for a larger number of outputs than was actually received. While the funding bodies should give further consideration to these issues in planning for a future exercise, there is some question around whether these levels of detail would be feasible for HEIs to provide at the stage of conducting the survey. Further user research would be needed to determine this.

292. Participation in the survey was a requirement for submitting to REF. Institutions were invited to participate in July 2019 via a letter to heads of institutions⁵³. With the letter, we provided details about the information that would be required in the survey, including what information on research specialisms was requested by each of the sub-panels. The letter also set out the timeframe for the survey, which ran from the end of September to December 2019.

293. All HEIs planning to submit to the REF completed the survey. Institutions were able to provide one submission intention per UOA, including the following information:

- Total number of CAT A submitted staff (headcount).
- Total number of CAT A submitted staff (FTE).
- Whether the HEI was involved in a joint submission for this UOA and, if so, the other institutions involved in the joint submission.
- Total number of outputs to be submitted
- The approximate proportion of submitted outputs that would be in each output collection format.
- The approximate number of interdisciplinary research outputs to be submitted.
- The approximate number of impact case studies to be submitted under each impact type, along with a supporting statement.
- Further details about the research specialisms of the outputs to be submitted.

294. The design of the survey incorporated key changes from data previously collected, principally reflecting changes to the submission of staff and outputs.

⁵³ See 'Institutions invited to complete the REF survey of submission intentions' (2019) available at www.ref.ac.uk under 'Publications and reports'.

We also drew on key feedback from REF 2014 to increase the usefulness of the information returned – including around impact and in particular, where an open text box had previously been of only limited use. Instead, we drew on the broad impact areas that were set out in the 'Panel criteria and working methods' (Annex A) and invited institutions to indicate the number they anticipated submitting under each heading, along with a brief description. This was successful in providing a broader view to sub-panels around the likely areas in which impacts would be submitted; however, it tended to provide an overestimate of the total case studies any given panel would receive, so needed to be used alongside the estimated case study numbers based on staff FTE.

295. The survey closed on 6 December 2019. One extension request was granted, and the full set of survey responses was complete on Monday 9 December. To assist with internal planning, we provided a dataset to each funding body, comprising the survey responses for their HEIs.
296. The detailed survey data was considered by the main and sub-panels in the meeting rounds that took place across late January to early February 2020, and informed decisions on where further panel appointments were needed for the assessment phase. As we used the submission system to collect the data, there was a good level of flexibility in terms of data extraction for the secretariat, whose task it was to prepare an analysis of the data for their sub-panels. The one item of data that needed to be treated with particular caution was the estimated number of IDR outputs for submission, given that institutions might not yet have had a full picture of which outputs would be flagged. It was also of limited use as a total number, without any further indication of research topic.
297. The data returned in the survey showed a substantial estimated increase in the number of submitted staff compared with REF 2014, as was expected following the change to the submission requirements. It also indicated that the total volume of outputs and impact case studies would be very close to the volume submitted in 2014, thereby achieving the policy aim intended when the output and case study requirements were determined – although we expected the number of outputs to be a slight overestimation as we did not ask HEIs to take account of any planned circumstances reductions.
298. A high-level summary of the data was published in January 2020, including the estimated changes in FTE by main panel. This highlighted the variation in change

expected across the disciplines, with the more detailed survey analysis showing where changes were likely to result in increases or decreases to a sub-panel's volume of outputs and case studies for assessment, compared with 2014.

299. At an exercise level, key survey data proved to be reasonably accurate. The total FTE of staff to be returned under-estimated the eventual number by only 2 per cent. Outputs and case studies were both slightly over-estimated, by less than 1 per cent of the final submitted volume, and 2 per cent, respectively.

5.7 Research income, income-in-kind and doctoral degrees awarded data

Key points

- To support HEIs in collating REF4 data, the REF team provided REF4a/b data to institutions via the submission system, and REF4c data was provided to HEIs directly by the relevant funders. The second dispatch of REF4 data was delayed due to COVID-19 and provided in summer 2020.
- In view of a new Financial Reporting Standard introduced from 2015, we agreed to present data to panels on research income for 2015–16 to 2019–20 as an average over five years in order to moderate the effects of the new standard. However, this limited the extent to which the sub-panels could look at income trends across the period.
- Drawing on learning from REF 2014, we did not schedule a formal period for adjusting the HESA data being used for validation. Requests could be made on an exceptional basis, leading to ten adjustments to the validation limits in the submission system.
- There were several challenges that arose in the preparation of REF4c data for submission. In recognition of issues affecting NERC data, we ran a data adjustment process in late 2020 for HEIs that had identified a significant discrepancy in their data from NERC. Under this process, data adjustments for 12 institutions were made.

Recommendations

- Commence work with the relevant income-in-kind funders, in consultation with HEIs, as early in the process as possible, so that it is clear what data is required well in advance of provision and what data HEIs hold or can check. This should include early identification of central resource for co-ordination and dispatch within UKRI, as well as analytical resource within Research England to support the REF team on the technical aspects of the data requirements.
- Engage early with both the relevant funders and institutions to identify a streamlined and workable approach to reporting income-in-kind from collaborative awards.

300. Each REF submission was required to include the number of research doctoral degrees awarded in each academic year 2013–14 to 2019–20; data on the submitted unit's external research income for each academic year 2013–14 to 2019–20; and the estimated value of Research Council facility time (income-in-kind), and for submissions in UOAs 1–6, the estimated value of equivalent income-in-kind from the health research funding bodies.
301. Following the approach adopted in REF 2014, to minimise burden on HEIs, the definitions were again aligned with those used in the HESA financial and student returns (and from 2018-19 onwards, for finance data for English HEIs, the OfS return), and the income and doctoral awards were not tied to submitted staff only. The total values reported, therefore, needed to align with the values reported to HESA. In terms of individual submissions, HEIs needed to map their data to the relevant REF UOAs. HEIs were required to submit the data via the REF submission system, which imposed upper limits at the institution-level, based on their HESA returns.
302. In 2015-16 a new Financial Reporting Standard (FRS) 102 was introduced, which meant that a significant grant for an asset (such as a building or equipment) would now appear in full in income in a particular year, instead of being reported in fractional shares spread over the expected lifetime of the asset. During the development of the guidance, it became clear that this could result in more significant year-on-year fluctuations in income than previously. We therefore agreed to present data to panels on research income for 2015–16 to 2019–20 as an average over five years in order to moderate these effects.
303. Additionally, we needed to collect data from Welsh universities for 2015/16 on deferred capital and revenue grants for research which were omitted from the HESA record because of the introduction of new reporting standards. These were collected at the time for universities in England, Scotland and Northern Ireland because of its use for funding purposes, but was not collected for Wales. The REF team worked with HEFCW, who collated the missing data from participating universities in mid-2018. The REF team then added these data to the figures used for validation in the submission system.
304. To support HEIs in collating this information, the REF team provided the following to institutions via the submission system:

- HESA data on the numbers of research doctoral degrees awarded for academic years 2013-14 to 2018-19.
- HESA / OfS research income data for academic years 2013-14 to 2018-19

305. Income-in-kind data compiled by each research council was collated centrally by UKRI and sent directly to HEIs for the period 2013-14 to 2019-20 (data supplied to end of March 2020). The relevant health research funding bodies provided the equivalent income-in-kind data directly to HEIs.

306. In September 2019, we provided HESA data on research doctoral degrees awarded and research income for academic years 2013-14 to 2017-18 to HEIs via the submission system. The first dispatch of income-in-kind data from UKRI and the health research funding bodies was sent directly to institutions during autumn 2019, although some delays were encountered in providing the data by some bodies due to staffing and technical issues.

307. The second dispatch of REF4 data (including data from 2018-19) was originally scheduled for the end of March 2020, but this was delayed due to COVID-19. The REF4a (doctoral degrees) and REF4b data (research income) was dispatched to HEIs via the submission system in June 2020. REF4c data (income-in-kind) from the research councils was dispatched to HEIs via UKRI in August 2020. The second dispatch of data from the health research funding bodies took place across mid-2020, with some of the bodies' provision of this further delayed while they prioritised COVID-19 work.

308. HEIs were required to use their own records to provide data for AY 2019-20, and these were checked against HESA / OfS data later on through the REF audit.

309. The submission system limits for the environment data were based on the data provided to HEIs. Building on the resource-intensive experience from REF 2014, and reflecting on the intention to use of existing data to help manage burden, the guidance made clear that a formal period for adjusting the HESA data being used for validation would not be scheduled. Institutions were therefore encouraged to ensure their HESA data returns were as accurate as possible. We did flag that institutions could approach the REF team if they identified incorrect data that would constitute a material change to that which was held in the system. Ten adjustments to the validation limits in the submission system were made in consequence.

310. To arrange for the income-in-kind (REF4c) data to be provided by the relevant funders to HEIs, we convened a meeting with them in early 2019 to review the list of facilities and discuss the detailed approach to providing the data. This informed the development of the guidance on the income-in-kind definition and methodology, which was published on the REF website in spring 2019.⁵⁴ Conversations with the research councils in particular continued during this period, as it became apparent that data for some facilities would not be available due to the way it was collected. The co-ordination and dispatch of the data was undertaken by the central data team in UKRI; however, resource for this was identified late in the process, meaning there had not been the opportunity for colleagues to be involved in earlier development and planning discussions. In future, the funding bodies should commence work as early in the process as possible with the relevant funders and in consultation with HEIs, so that it is clear what data is required well in advance of provision and what data HEIs hold or are able to check. This should include early identification of central resource for co-ordination and dispatch within UKRI, as well as analytical resource within Research England to support the REF team on the technical aspects of the data requirements.
311. There were several challenges that arose in the preparation of REF4c data for submission. Some of these arose from challenges identified by the research councils in collating the data for some facilities, due to the way that grant information had been recorded; others arose from issues encountered by HEIs in identifying partners in collaborative awards – with the resource implications of this exacerbated by the effects of COVID-19 later on in the submission phase.
312. In some cases, it was clear that the issues had the potential to moderately or significantly under-report income-in-kind awarded in the assessment period and/or cause issues with institutions staying within the validation thresholds set in the submission system. We therefore took several steps to address these issues for the REF 2021 exercise, with the funding bodies recognising that a fuller review of these issues would be required to identify improvements for a future exercise. These steps included updating the guidance on the approach to returning REF4c data related to partnerships, under which HEIs could return the full value of REF4c data that was provided to them, without needing to calculate and deduct the proportions applying to partner institutions; where an institution

⁵⁴ See 'Research income-in-kind methodology and facilities list' (2019) available at www.ref.ac.uk under 'Additional guidance'.

held records of eligible income-in-kind awarded through a collaborative grant that was not included in the REF4c data provided to them, this could be included in the REF4c return where the HEI could verify it. This may have required the HEI contacting the REF team to discuss increasing the system validation limits; and we prepared a briefing for the REF sub-panels to outline the issues experienced with collaborative REF4c data (as well as the NERC adjustment process, as described below paragraphs 313 to 314). In future exercises, the funding bodies should engage early with both the relevant funders and institutions to identify a streamlined and workable approach to reporting income-in-kind from collaborative awards.

313. A further significant issue affecting a proportion of HEIs was related to the income-in-kind data provided by NERC. The total value of this indicated a substantial shortfall, which was due to issues with how data had been recorded, as well as the way some access is provided, for some NERC facilities. Furthermore, a revision of the facility portfolio in 2016 meant that not all facilities could provide data. The shortfall showed the value was nearly £50 million less than the 2014 data, with the 2021 data running over a longer timeframe. REF team analyses indicated that for a small number of HEIs, the shortfall arising from the missing data would be very significant. We therefore ran a data adjustment process in late 2020, allowing HEIs that had identified a significant discrepancy in their research-income-in-kind data from NERC to request an adjustment to the validation limits in the submission system, providing supporting evidence for the case.
314. The evidence was reviewed by the REF audit team, with recommendations made to the REF director for adjustments where the evidence was deemed to support the request, there was no duplication between the awards in scope for the adjustment and the data provided by NERC, and the facilities were included in the published list. Adjustments were only made to the validation limits where these were materially affected by the missing data, to enable the HEI to pass system validation. In some cases, this meant the adjustment was not for the whole amount claimed (although this would still have enabled the whole amount to be returned). Under this process, data adjustments for 12 institutions were made.
315. The REF4a/b/c environment data was provided to the sub-panels as part of a 'standard analysis' that also included data on the numbers of staff and outputs in each submission. It included the absolute numbers as well as 'per staff' figures for the income and doctoral awards data, to put the environment data in context

with the size of individual submissions. The impact of the change in reporting standards, which meant that income data were presented as an annual average across the period 2015-16 to 2019-20, limited the extent to which the sub-panels could look at income trends across the period.

5.8 Citation data

Key points

- Following a procurement exercise, in November 2018 Clarivate Analytics were announced as the citation data provider for REF 2021.
- HEIs could 'match' journal articles and conference proceedings in the submission system and retrieve the citation counts from the Web of Science database via an API developed by Clarivate; the specified time requirements for returning these data were met throughout the submissions phase.
- Clarivate took a final 'snapshot' of citation counts for all matched outputs shortly after the submission deadline in April 2021. The final contextual dataset was made available in April 2021. Additional, earlier versions of the contextual data were made available to HEIs during the submissions phase.
- User support was provided by Clarivate for queries about matches or the returned citation counts. A high level of support was given to institutions, with the specified target response times all met or exceeded.

316. In developing the panel criteria, sub-panels were invited to decide whether they wished to use citation information to inform their review of outputs. Eleven of the 34 sub-panels chose to do so (sub-panels 1-9, 11 and 16). They recognised the limitations of such data and used citations in a positive way as an indicator of the academic significance of the output (as described in the 'Panel criteria').

317. Through a procurement exercise, the REF team contracted Clarivate Analytics to provide the citation data, to both institutions and the relevant panels. The contract award was announced in November 2018. The submission system included functionality for HEIs to 'match' outputs in the relevant UOAs and retrieve the citation counts (journal articles and conference proceedings only) from the Web of Science database, through an Application Programming Interface (API) developed by Clarivate. The Service Level Agreement (SLA) specified time requirements for the API, which were met throughout the submission phase. The REF team liaised regularly with Clarivate during the submission phase to ensure timely delivery and achievement of the SLA⁵⁵.

318. Clarivate took a final 'snapshot' of citation counts for all matched outputs shortly after the submission deadline in April 2021. These citation counts were provided to the relevant sub-panels for use in the assessment. The citation counts were

⁵⁵ The SLA is available at www.ref.ac.uk, under 'Citation and contextual data guidance'.

not updated during the assessment phase of the REF, to avoid potential inconsistencies.

319. In addition, Clarivate produced contextual data which was provided to the sub-panels to assist them in interpreting citation counts, given that citations depend partly on the field of research and a publication's age. A specification was developed for the contextual data, drawing on advice from the citation data panel user group⁵⁶. The group comprised 13 members from the sub-panels that would use citation data during the assessment phase, with representatives from Research England, Clarivate and the Forum for Responsible Research Metrics⁵⁷.
320. To help institutions understand the contextual data when preparing submissions, the REF team provided early versions of it to HEIs during the pilot phase of the submission system and in early 2020. Following feedback from institutions on the value of having access to more up-to-date citations contextual data when preparing submissions, we agreed with Clarivate to provide a further release to HEIs in September 2020. This covered the years 2014 to 2019. Following the delay to the REF due to COVID-19, we also agreed to provide a further release of contextual data in January 2021. The final contextual dataset was made available in April 2021.
321. Institutions were able to contact Clarivate directly by phone or email to raise queries about matches or the returned citation counts. The submissions system also provided a direct way for institutions to submit queries by email. The number of support queries was very low (under 10) for the majority of the submission phase until the final three months before the submission deadline. Queries peaked at 189 received in March 2021⁵⁸. Clarivate provided a high level of support for institutions throughout the submission phase, with the specified target response times all met or exceeded.

⁵⁶ The specification is available at www.ref.ac.uk, under 'Citation and contextual data guidance'.

⁵⁷ Further information on the UK Forum for Responsible Research Metrics can be found at <https://www.universitiesuk.ac.uk/topics/research-and-innovation/uk-forum-responsible-research-metrics>.

⁵⁸ Clarivate (2022), 'Citation data in REF 2021: Final project report'.

5.9 Supporting HEIs

Key points

- Support for HEIs was provided via a range of approaches during the submissions phase, including through communications with HEI REF contacts, webinars and briefing events, workshops, supplementary guidance, the REF website and our dedicated queries inbox.
- We received a high volume of queries via the inbox, with this increasing significantly in the latter stages of the submissions phase. Over 1,300 queries were received in the four months leading up to the March deadline.
- Throughout the submission phase, the REF team engaged with a range of sector groups representing research professionals; this was of particular value during the COVID-19 pandemic, to gather initial evidence and information quickly.

Recommendations

- Consider implementing a ticketing system for managing info@ref queries early on in any future exercise. Requirements will need to be specified in detail, to ensure the system is fully compatible with the way it will be used.

322. In late 2017 we invited institutions to nominate a REF main contact and a REF technical contact. The main contact acted as the primary point of contact between the institution and the REF team on all updates and enquires relating to REF policies and guidelines. The technical contact acted as the institution's main contact with the REF team regarding the REF submission software and system support. In setting up these contacts, we followed precedent from previous exercises, which continued to help streamline the management of HEI communications within the REF team and supported institutions to manage the dissemination of information effectively.

323. We also restarted the REF Jiscmail list, 'REF-NEWS', that had been created in REF 2014. Any individuals interested in staying up to date with the latest publications and other news related to REF were able to subscribe to the mailing list, which had around 2,000 subscribers across the course of the exercise.

324. Numbered REF publications, supplementary guidance and FAQs were published throughout the criteria and submissions phase of the REF on the REF website (www.ref.ac.uk). In line with environmental considerations, we took the decision not to provide printed copies of the documents for institutions. We only provided a printed copy of the guidance and criteria to panel members, thereby significantly reducing the volume of printed documentation in contrast with the previous exercise. These were provided routinely, but consideration could be given to making this on a request-only basis in future to further reduce printed

material and to recognise that many members are more likely to access these documents online.

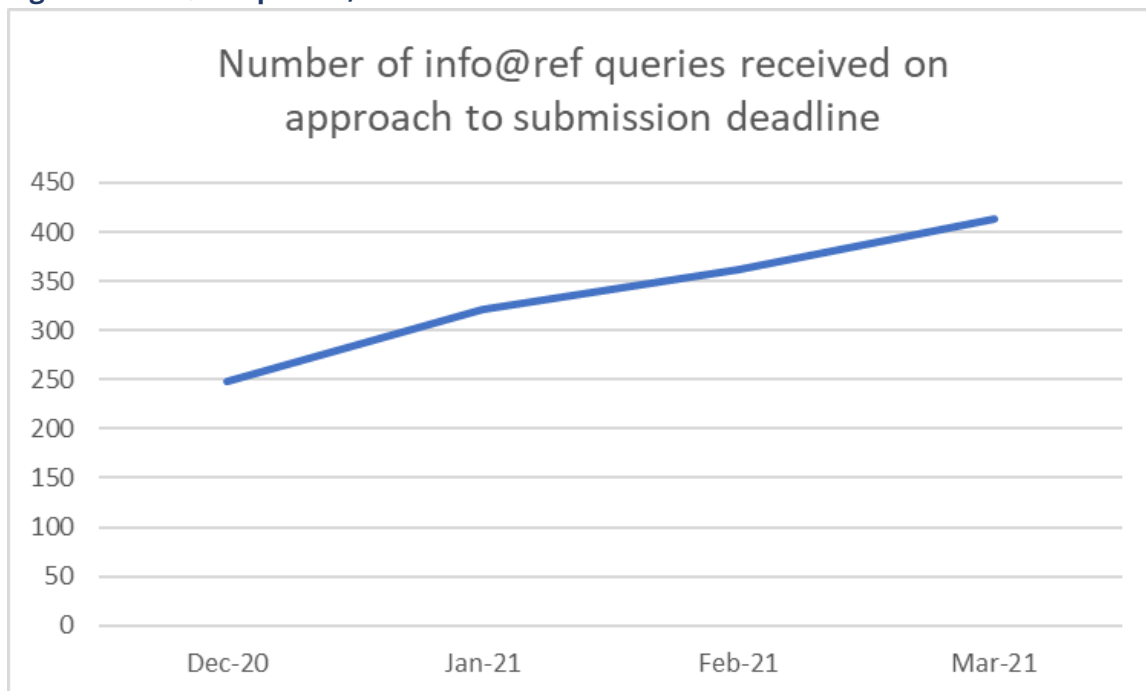
325. Supplementary guidance included planned additional material, such as guidance on excluding parts of submission from publication, as well as guidance that was produced responsively where a need or case for it was identified. This included additions such as the considerations for HEIs in making redactions to case studies, developed in consultation with the sub-panels; guidance for those providing testimonies for impact case studies; guidance on submitting practice research outputs; and advice on contingency planning for HEIs in relation to COVID-19 and REF.
326. The REF 2021 website was initially developed in HEFCE, building on the existing REF 2014 website, and was launched in October 2017. Due to the transition from HEFCE to Research England scheduled for April 2018, we needed to identify a longer-term approach for the REF website that was independent of the existing systems. Because of the need for continuity of use across the transition, and the early development stage of UKRI systems, we procured standalone hosting and content management system, with the transfer of existing content on to the new site included in the tender. The transfer was complete by October 2018. The REF team received training on the new content management system, meaning all web content could continue to be designed and published directly by the REF team. This was a very beneficial aspect of the independent website, allowing responsive communication via the website – for example, during COVID-19.
327. Early in the submission phase, the REF team held three 'good practice' workshops to support HEIs in developing their code of practice and ran three webinars around codes of practice, staff circumstances and equality impact assessments. Webinars proved an effective way to provide further support to institutions, with additional webinars on codes of practice and staff circumstances delivered later on in 2019, as well as during the consultation on COVID-19 mitigations the following year.
328. In June 2019, the REF team held a series of three briefing events on REF 2021 in London, Birmingham and Edinburgh. These events offered briefings on the final guidance and criteria, as well as on data, audit and the submissions system. Main panel chairs also attended the events, which were well attended by delegates from HEIs. Responses received via our post-event feedback survey indicated that attendees found the information provided useful. They valued the opportunity to

ask questions during the sessions and while not all of the questions asked could be resolved on the day, the attendees appreciated the efforts of the team to note questions for future FAQs.

329. In view of the changes to the HE landscape in England (see section 0), we had several institutions participating in the exercise who were new to research assessment. We held a workshop for these HEIs in autumn 2019, to support them around the more technical aspects of environment submissions (including REF4 data).
330. Early on in the exercise, we reinstated the REF queries mailbox used in REF 2014, info@ref.ac.uk. During the submission phase, institutions were able to contact the REF team by email where they had particular questions arising from the guidance documents. Dedicated resource was in place to provide first responses and to 'triage' queries requiring input from others in the team, or wider colleagues across RE (for example, from our analysts). Throughout the submission phase, the REF policy team met regularly to review complex and frequently arising queries, with the regularity increasing to twice weekly in January and February 2021, and three times a week from the end of February 2021 to ensure responses could be provided as soon as possible.
331. We received a high volume of queries via info@ref, with this increasing significantly in the latter stages of the submissions phase. Additional resource was required from within the REF team to help manage these queries. We also sought to improve our management of the queries through implementation of a ticketing system. Drawing on the success of the ticketing system being used to provide user support for the submission system, in early 2020 we migrated management of our policy queries to this system also. However, the initial configuration of the ticketing system did not work for the different nature of managing the policy queries, compared with user support, meaning we experienced two low level information incidents where individuals were inadvertently included in copy to correspondence. Following a detailed risk analysis process and careful reconfiguration of the system for policy use, in late November 2020 management of policy queries was again transferred to the ticketing system, without further issue and to substantial benefit of the query-management process. In the four months prior to the submission deadline in March 2021, the team received over 1,300 queries. As figure 1 below shows, these increased steadily to a peak of over 400 in March 2021.

332. Our experience of using a ticketing system to manage the REF queries inbox suggests there would be considerable value in implementing one for queries early on in any future exercise. This would allow the establishment of efficient management processes from the outset, with better analysis and tracking of queries to support consistency in responses and reporting than a shared email inbox can provide. The requirements would need to be specified in detail, to ensure the system is fully compatible with the way it would need to be used.

Figure 1: info@ref queries, Dec 2020-March 2021



333. Following the introduction of the Public Sector Bodies (Websites and Mobile Applications) (No. 2) Accessibility Regulations 2018, which places an obligation on public sector bodies to ensure content delivered through websites is accessible, we provided additional guidance to institutions to support the accessible preparation of narrative templates (REF3/REF5). However, we identified and communicated this requirement at a late stage in the submission process. We therefore encouraged institutions to do what they could within the time and resource available to make PDF documents accessible by the submission deadline. Given that we would be publishing case studies in an accessible format in the impact case study database, we indicated that resource may best be directed in the first instance towards accessibility formatting for environment statements.

334. Throughout the submission phase, the REF team engaged with a range of sector groups representing research professionals, such as ARMA, the Scottish REF managers group and the 'Brunswick' group⁵⁹. These engagements were invaluable for helping the REF team identify issues and areas for clarification in the guidance, as well as for exploring options and potential mitigations. Our existing relationships with these groups were of particular value during the COVID-19 pandemic, where we were quickly able to gather initial evidence and information about the effects of the COVID-19 pandemic on submission preparation.

335. Informed by such evidence, in the lead up to the submission deadline, we were able to add further measures to support institutions, in response to the effects of COVID-19. In addition to the mitigations added to the guidance (see section 0), we adopted a flexible approach around the delivery of physical outputs (for more detail, see 0).

5.10 Output collection

Key points

- To support HEIs' provision of outputs to us for assessment, UKRI and the Copyright Licensing Agency signed a licence agreement giving the relevant permissions to HEIs.
- Submissions data showed a general increase in the proportion of electronic outputs returned across most output types, reflecting both the increased options set out in the guidance and the effects of COVID-19.
- Over 80 per cent of submitted outputs were journal articles, which we aimed to source directly from publishers. This was achieved through our work with the Publishers Licensing Society, who liaised with publishers to gain permission to download outputs directly from them. We were able to retrieve approximately 93 per cent of journal articles directly.
- Approximately 10 per cent of outputs were returned to REF 2021 in physical format.
- Institutions' collation of physical outputs was one of the areas more significantly affected by COVID-19. We implemented a flexible approach to delivery to support HEIs in managing these issues.

⁵⁹ The 'Brunswick' group is a sector-led group focusing on research assessment issues, and comprises research administration professionals from research-intensive institutions.

Recommendations

- Review the scope of the CLA license and the publisher agreements for a future exercise, to allow scope for additional analyses where it is practical to do so.
- Consider revisiting the issues around direct retrieval of ebooks for a future exercise. It would be beneficial to start this work early, and to engage with the CLA on discussions around licensing.
- With a view to further diversifying the electronic formats of outputs that can be submitted, review the guidance and approach to output collection. This should be done in consultation with panels and HEIs to ensure formats meet assessment requirements, are feasible, and are aligned with panel member appetite to review material almost entirely on screen.

336. We provided Initial guidance on output collection formats as an annex in the 'Guidance on submissions'. This took the 2014 output categories and collection formats as a starting position, and widened out the options for electronic versions of outputs to be returned. While this was predominantly PDF format for direct submission in the software, a URL/DOI linking to an output stored or presented online was permitted for several output categories. This annex also provided a glossary of output types, responding to feedback from institutions on the potential value of this. Technical guidance on detailed output information requirements was provided shortly after the publication of the guidance in 2019. Further detailed information on the practicalities of submitting research outputs, covering aspects including how to create and when to submit PDFs of outputs, was also published on the REF website in late 2019.

337. When the REF Steering Group held its review of the contingency arrangements in place for COVID-19 in autumn 2020, it considered mounting evidence around the challenges institutions were facing around the collation and prospective delivery of physical outputs, and in the preparation of outputs that need to be scanned for electronic submission. Additional flexibility was therefore added into the approach for collecting outputs, including allowing the submission of non-final versions of outputs in electronic form where these were previously expected to be submitted physically or scanned, and adopting a flexible approach to the delivery of physical outputs to the REF library⁶⁰. To facilitate the electronic submission of long-form outputs, we also increased the file size for output types A and B in the submission system to 500MB. These measures were

⁶⁰ The guidance on submitting research outputs is available at www.ref.ac.uk under 'Guidance and criteria on submissions'.

announced in the updated 'Invitation to submit' in November 2020. The arrangements for labelling and packaging physical items for delivery to the REF library were also set out at this point.

338. Anticipating an increase in the volume of electronic outputs returned, including of those output types more typically submitted in physical form, we worked with the sub-panels in autumn 2020 to provide additional guidance on submitting outputs that aimed to ensure the panels would receive all of the necessary information for their assessment under the increased flexibility offered. This was included in the updated November invitation. However, some concerns were raised by institutions about how the guidance related to that originally set out in the 'Guidance on submissions', and what they should do if they had prepared outputs for submission in line with this earlier guidance. Clarifying information was set out in FAQs to reassure institutions. While the timing of this work was driven by our need to respond to the effects of COVID-19, where wider electronic submission of outputs is envisaged in a future exercise, early engagement work should be undertaken with the expert panels and HEIs to inform the detailed requirements for output collection formats alongside the production of the guidance and criteria.
333. Early on in the exercise, in 2017, we began working with the Copyright Licensing Agency (CLA) to put in place arrangements that would enable HEIs to supply us with outputs in the intended formats for the purposes of the REF assessment. As had happened with HEFCE in REF 2014, UKRI and the CLA signed a licence agreement⁶¹ which permitted HEIs to photocopy or to scan licensed material from paper to digital form and to provide this material to UKRI; to submit paper copies of licensed material to UKRI; to submit the DOIs for licensed material to UKRI for storage on the data collection system; to download the publisher's PDF file (where the HEI is authorised to do so) to upload to the submission system; and to permit UKRI to make such licensed material available to panel members in paper or digital form. We also worked with the CLA to extend its royalty-free licence to continue allowing copyright-compliant storage and reuse of outputs in line with the revised timetable for REF due to COVID-19.
334. One issue that arose was a request to use REF outputs to conduct some research/analysis based on the full text of articles. Unfortunately, such use was

⁶¹ The licence agreement is available at https://www.ref.ac.uk/media/1215/he_20191003_ref-2021-agreement.pdf

outside the scope of the CLA licence and the publisher agreements, and we were not able to accommodate it. It is recommended that the scope of the CLA license and the publisher agreements are reviewed for the next exercise, to allow for such additional analysis where it is practical to do so.

335. As Table 1 shows, the proportions of output types received in 2021 were very similar to those seen in REF 2014. Both figures are inclusive of double-weighting requests. The notable exceptions are the changes observed in the proportions of authored books and chapters in books submitted, with a substantial increase seen for the former. Some of this change may be reflected in the increase in the number of double-weighting requests received in 2021. As the published output data shows, this was 8,565 requests compared with 2,848 in REF 2014. The vast majority of this (over 88 per cent) continued to be for output type A, authored book.

Table 1: summary of output types, 2021 and 2014

Output type	REF 2021		REF 2014		Change in % of outputs
	Count of outputs	% of outputs ⁶²	Count of outputs	% of outputs	
A - Authored book	19,044	10.3%	12,873	6.7%	3.6%
B - Edited book	2,083	1.1%	2,066	1.1%	0.0%
C - Chapter in book	7,134	3.8%	13,253	6.9%	-3.1%
D - Journal article	149,701	80.7%	153,626	80.4%	0.3%
E - Conference contribution	2,223	1.2%	2,738	1.4%	-0.2%
F - Patent / published patent application	35	0.0%	111	0.1%	-0.1%
G - Software	12	0.0%	38	0.0%	0.0%
H - Website content	85	0.0%	157	0.1%	-0.1%
I - Performance	339	0.2%	491	0.3%	-0.1%
J - Composition	429	0.2%	667	0.3%	-0.1%
K - Design	160	0.1%	190	0.1%	0.0%
L - Artefact	386	0.2%	732	0.4%	-0.2%
M - Exhibition	806	0.4%	1,255	0.7%	-0.3%
N - Research report for external body	432	0.2%	688	0.4%	-0.2%
O - Confidential report (for external body)	14	0.0%	28	0.0%	0.0%
P - Devices and products	14	0.0%	25	0.0%	0.0%
Q - Digital or visual media	398	0.2%	487	0.3%	-0.1%
R - Scholarly edition	480	0.3%	436	0.2%	0.1%
S - Research data sets and databases	49	0.0%	79	0.0%	0.0%
T - Other	1,336	0.7%	553	0.3%	0.4%
U - Working paper	392	0.2%	657	0.3%	-0.1%
V - Translation	43	0.0%	-	-	-

⁶² %s are rounded to one decimal place

336. As the data in Table 1 show, the majority of outputs submitted into the exercise in 2014 were journal articles. Following the approach adopted in that, and previous, exercises, we again planned to source these submitted outputs directly from publishers where possible.
339. Facilitated through our work with the CLA, in 2018 we began early discussions with the Publishers Licensing Society (PLS), who were again very willing and helpful in working with us to repeat the 2014 approach of gaining permission from publishers to download outputs directly from their websites, using DOIs provided by HEIs. We announced the collaboration in April 2019, underlining how the agreement with both PLS and CLA would reduce burden in submitting outputs for assessment, and would provide assurance that outputs were handled in accordance with copyright. Based on REF 2014 submissions, we provided details of relevant publishers and the PLS began raising awareness and contacting them to gain their permission. As in the previous exercise, publishers generally proved to be willing although, as with that exercise, some overseas publishers required additional efforts. To support this work, we contracted a consultant with previous experience, who successfully managed contact with overseas publishers.
340. Partly as a result of the REF Open Access policy, the emerging UKRI OA policy and other, wider developments in this area, some journals had become fully open access and therefore licences with these publishers were not required. This is a trend that is expected to continue, though it will not provide complete coverage of the scope of eligible journal articles and conference contributions. It is therefore to be expected that some publisher licences will still be required for the next exercise.
341. Once each publisher indicated their agreement, the REF team liaised with them to arrange download access to their websites, and developed the submission system software to retrieve the outputs. This was a resource intensive task for the REF development team, with some technical issues encountered during the retrieval process. See paragraph 257 for further details. Nonetheless, through this approach, we were able to retrieve approximately 93 per cent of journal articles directly.
342. In the early stages of the exercise, we had considered the feasibility of expanding direct retrieval / access across some other output types that were now more frequently available in electronic form – including ebooks. However, we identified similar technical challenges around implementation that had been identified in

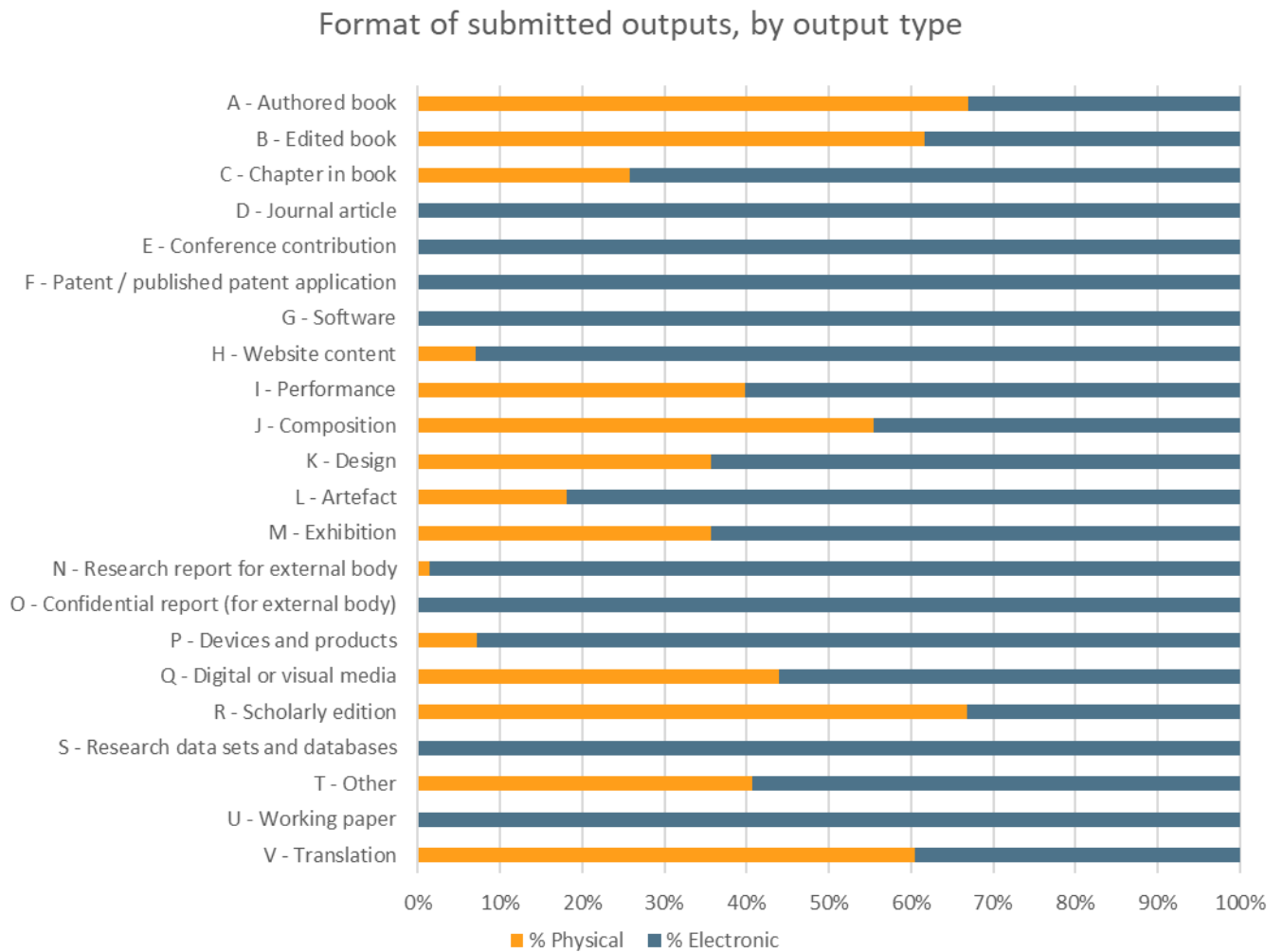
2014 – for example, differing reading software requirements across ebook publications. We revisited the possibilities around this in 2020, in our work to explore ways to address potential issues with physical output submission, including in discussion with the British Library. However, we continued to identify several challenges around licensing and technical issues that were not considered feasible to address for this exercise. The funding bodies should consider revisiting the issues around ebooks for a future exercise. It would be beneficial to start this work early, and to engage with the CLA on discussions around licensing.

343. Where we were unable to source electronic outputs directly from publishers, HEIs needed either to provide an electronic copy via the submission system, or provide us with a physical output. All electronic outputs needed to be uploaded by the submission deadline on 31 March 2021. The submission system started to retrieve journal articles and conference contributions from the majority of publishers in January 2021. We expected to be able to retrieve the majority of outputs within three weeks of the output being entered into the system. We provided a report in the system from January to let institutions know where we had been unable to retrieve outputs already entered into the system, and the institution should therefore upload the output. We advised HEIs to wait for 3 weeks following the addition of a new output to the system before running the report and uploading if necessary. This reduced to seven days in February, and one working day in March 2021, before running the report and uploading where necessary.
344. We still needed capacity to collate and store physical outputs for distribution to panel members. Further information on the process we followed to procure the facilities, equipment and software for the library are set out in chapter 0. As noted above, institutions' collation of physical outputs for delivery to the library became one of the more significant areas affected by COVID-19. We implemented a flexible approach to the delivery, which began with a provisional schedule developed in December 2020.
345. The issues with collating physical outputs were exacerbated by the increasing COVID-19 infection rates and consequent restrictions reintroduced during winter 2020/21. In January 2021, we made clear to institutions that our approach remained one of flexibility, with the aim for outputs to be delivered in sufficient time for the assessment, while being able to respond to the increased challenges. The REF library team began working with institutions individually to identify a feasible delivery schedule, which included the option to make deliveries in batches. The final delivery schedule covered a period from 7 April 2021 to 14 May 2021,

which was then extended to 28 May 2021, for institutions who required an additional delivery slot for any remaining physical outputs that were unavailable earlier in the schedule, or delayed their delivery slot in order to send all physical outputs together following the difficulties experienced in collating the material for submission.

346. Approximately 10 per cent of outputs were returned to REF 2021 in physical format. Not accounting for double-weighting, the number of submitted physical items held by the REF library was 13,176. This continued a decreasing trend in the number of physical submissions seen in REF 2014 (21,588).
347. As shown in figure 2, authored books and scholarly editions were the output types most likely to be returned in physical format (both 67 per cent physical). However, in comparison to the previous exercise, there was a general increase seen in the proportion of electronic outputs across most output types – particularly in those that reflect practice research or other forms of non-text output (including types I, J, K, L, M, P – see figure 2 for description of these types). This is likely to reflect both the increased flexibility built into the output collection formats guidance and the effects of COVID-19 on submission preparation, as well as changes in the nature of research outputs with increasing digital approaches.
348. As noted above (paragraph 164), there is certainly scope for reviewing the guidance and approach to output collection, with a view to further diversifying the electronic formats that can be submitted. However, consideration will still need to be given to the willingness of panel members to review material almost entirely in virtual format – especially where there are accessibility requirements. As with the REF 2014 process, there was a high demand for the library's printing service in REF 2021 – for outputs, case studies and environment templates – and this was exacerbated by increased volume of long-form outputs that had been submitted electronically, notably Authored Books, Edited Books and Chapters in Books. The environmental impact, the resource requirement of the library staff, and the financial cost of the output printing were all quite significant.

Figure 2: format of submitted outputs



5.11 Summary of submissions

349. The deadline for submissions to the REF was 31 March 2021. 157 institutions participated in REF 2021. Under the additional provisions for COVID-19, one institution was granted a two-week emergency extension to the submission deadline. All remaining institutions submitted by 31 March.

350. The volume of staff returned showed a 46 per cent increase to the previous exercise, as anticipated following the change requiring the submission of all staff with significant responsibility for research. The overall volume of submitted material was broadly similar to the previous exercise, as had been the aim when setting the output and case study requirements in line with the new approach to staff submission. Table 2 below provides a summary comparison.

Table 2: submission summary data

	Number of submissions	Category A staff FTE	Number of outputs	Number of impact case studies
REF 2021	1,878	76,132	185,594	6,781
REF 2014	1,911	52,061	191,950	6,975
Difference	-33	24,071	-6,356	-194
% change	-2%	46%	-3%	-3%

351. The effects of the changes made to the exercise had a different impact across the panels. Main Panel C saw the largest increase in submitted staff at 63 per cent, and consequently was the only main panel area to also see an increase in the overall volume of outputs and case studies submitted in contrast to REF 2014.

352. Institutions' submissions ranged enormously in size and scope. The smallest submission included 1.9 Category A submitted staff FTE and the largest included over 498. At institutional-level, submissions ranged from under 4 FTE submitted in a single UOA, up to around 3,400 FTE submitted across 29 UOAs. More detailed information about submissions is provided on the REF website and in the main panel overview reports.

353. One of the revisions made to the exercise to take account of the effects of COVID-19 on REF submissions included the option to request an extension to submitting the narrative templates (REF3 and REF5). This measure gave support where it was needed, with around 3 per cent of impact case studies and 7 per cent of

environment statements (either one of both of the REF5a/b) submitted within the six weeks following the 31 March deadline. The extensions were taken up by over 40 institutions. A small number of HEIs misunderstood the requirement to still complete the remainder of the REF3 (impact) form prior to the submission deadline where they had a REF3 template extension in place. This required the REF team to collate the missing data from the HEIs shortly following the submission deadline.



6. Assessment phase

6.1 Preparation for the assessment

Key points

- The initial meeting schedule for the assessment phase was confirmed in late 2019; this needed revising in light of the COVID-19-related delay to the exercise.
- Survey feedback showed the majority of panellists felt the revised meeting schedule was quite or very effective in supporting the business of their panel; however, some key challenges were also identified.
- In response to the delayed timetable, additional preparation meetings for the panels were held and a revised approach was implemented for new member/assessor inductions.
- These revised processes required significant resource to deliver within a short timeframe; however, feedback indicated very high or high levels of satisfaction with induction.

Recommendations

- Seek to confirm meeting format (virtual/in-person) well in advance of a future assessment phase and limit flexibility around changes to it, to better support planning and enable members to have early confirmation of meeting arrangements

6.1.1 Meeting scheduling

354. At the end of the criteria phase in 2018, we began discussing plans for the assessment phase with the main and sub-panels. This included early decisions on the sequence of assessment and broad workplan so that work could begin in 2019 on scheduling the assessment phase meetings, and thereafter on arranging the meeting venues. Early confirmation of the schedule was a key part of the planning for the exercise, to ensure members' and venue availability.

355. Drawing on learning from the previous exercise, we sought to adopt a common sequence for the assessment across the main panels, which would start with outputs, before moving on to impact and then environment. The completion stages for each of these elements varied by main panel area, reflecting the different nature of output submissions each received. This was agreed at the final criteria-phase meetings, along with agreement that all sub-panels within a main panel would work to the same deadlines.
356. We surveyed panel members at the end of the criteria setting phase to seek views on their experiences of the locations, travel and venues used during the 2018 panel meetings, to inform bookings for the assessment phase.
357. Throughout 2019 the REF team then worked with the main and sub-panel chairs to develop more detailed workplans and schedule meetings for the assessment phase, drawing on the broad schedule followed in the previous exercise as a starting point. The common sequencing of assessment that we agreed for REF 2021 helped this process, in particular the scheduling of key business of the main panels to ensure effective review and oversight. At the end of exercise survey of panel members, 80 per cent of respondents felt that the sequencing of assessment was either quite or very effective.
358. The preliminary scheduling work included agreeing how groups of sub-panels within each main panel would be clustered together, meeting on the same dates and in the same location, to facilitate joint assessor and main panel international member attendance at sub-panel meetings. Following this, sub-panel chairs were further consulted on aspects of the meetings including: chair's availability, the required duration for each meeting, output and impact assessor attendance at relevant meetings, and preference of meeting location.
359. Panel members were then canvassed for their availability and all meetings were scheduled by late 2019. The final dates were identified to maximise attendance for each panel and cluster.
360. The meeting schedule was considered by the main and sub-panels at their round of meetings in early 2020, to review and confirm the key agenda items for each meeting, the proposed interim and final deadlines for assessment processes (such as cross-referral, proportion of material reviewed and so on), and the proposed dates where output or impact assessors would attend.

361. In March 2020, however, when the REF was put on hold due to COVID-19, there were immediate implications for the planned assessment schedule. It was not until we had been able to confirm a restart date and revised submission deadline in June 2020 that work could begin in earnest on revising the assessment phase meeting schedule.

362. In view of the four-month delay to the exercise, the start of the assessment phase needed to move from January 2021 to May 2021. Given the ongoing uncertainty in relation to COVID-19 restrictions, we also needed to make plans around starting the assessment phase in virtual format, although at this stage we hoped to return to in-person meetings from September 2021.

363. As described in section 0, we began meetings with the panels early in the mitigations period, which included close consideration of the effects on the assessment year. At the round of virtual meetings we held across June and July 2020, we discussed a revised approach to the meeting schedule and workplan with the panels. This highlighted some key considerations, including:

- Workload concerns arising from the four-month delay to the assessment. The delay meant the workload fell differently across the annual academic cycle, bringing in more semesters and the summer break. In some cases, this affected the 'teaching relief' arrangements that many members had put in place within their institutions.
- A need for meetings during a virtual phase to be scheduled differently – incorporating more regular, but shorter, meetings.
- Confidence around the approach to assessing outputs remotely, but concerns around doing this for impact and environment. This meant that some panels wanted to 'front-load' more of the output assessment and pushback the other elements into a timeframe when in-person meetings might be more feasible.
- A need for more support for the assessment process, including more members/assessors in the event of significant COVID-19 effects on the panels, greater flexibility for individual sub-panels around scheduling, and advice from the funding bodies to institutions on the effects of the delays on the assessment plans.
- A need for further planning meetings in advance of the start of the assessment phase in May 2021.

364. In light of the feedback from panels, we began the process of reconvening for the assessment phase dates, commencing with a sub-panel chair survey in August 2020 and confirming revised schedules with members in the early autumn. This work incorporated advice on the changes to meeting frequency and duration during the virtual phase, and changes made to the workplans where output assessment was being more 'front loaded'. We also scheduled in dates for the advisory panels, IDAP and EDAP, the Main and Advisory Panel chairs group (MAP) and the IDR network.
365. We also sought to draw on the existing scheduled dates (from May 2021 onwards) as far as possible, recognising these were already being held in members' diaries. While this offered logistical advantages in revising the schedule within a short timeframe, in some cases during the assessment year it became clear that the original scheduling had not always mapped well on to the new workplans. For example, meetings were not always spaced appropriately for the stage of assessment. Responding to some of these issues, some sub-panels added in extra meetings during the assessment process.
366. When panels were surveyed at the end of the exercise, the majority of respondents (almost 80 per cent) thought that the revised meeting schedule was quite or very effective in supporting the business of their panel, with some of the comments indicating recognition of the challenges posed and that the schedule was as good as it could have been in the circumstances. However, across the textual responses to this question, it was clear that some panel members found the shift in timings and subsequent workloads stressful, with the comments underlining some of the issues noted above. This includes workload pressures in relation to where the assessment load fell across the academic year, issues with the spacing and frequency of meetings, and more consideration needed in relation to the meeting format.
367. The ongoing uncertainty about the course of the pandemic throughout late 2020 and much of 2021 significantly affected our ability to plan and prepare for in-person meetings. This meant that venue, travel and accommodation arrangements were necessarily made at short notice. Further detail about meeting format and meeting administration is provided in sections 0 and 0 respectively. Where adopting any mix of virtual and in-person meetings in a future exercise, it would be advisable to confirm the format well in advance of the assessment phase and limit flexibility around changes to it, to better support

planning and enable members to have early confirmation of arrangements (assuming any plans laid out are not disrupted by global emergencies!).

6.1.2 Preparation meetings and induction processes

368. Across January and early February 2020 (pre-COVID-19), the main and sub-panels met in person to begin preparations for the assessment phase. We followed the approach taken during the criteria phase for these meetings, convening all sub-panels within a main panel together at the same time. This again proved a successful model whereby the day was split into main-panel wide plenary sessions, allowing opportunity for updates and discussion with the wider main panel group, as well as individual sub-panel meetings to focus on detailed agenda items.

369. These meetings covered:

- The need for further appointments following the survey of submission intentions (see section 0 for more details on this process).
- Planning for the assessment phase, including agreeing detailed working methods for processes such as allocation, calibration, and raising audit queries, and reviewing the meeting schedule.
- Considering the specification for the assessment systems in view of the panel's requirements.

370. In addition to these early meetings, we had also planned to hold briefing sessions for newly appointed members and assessors in the autumn of 2020, in advance of the planned start of the assessment in December 2020 and January 2021. However, the revised timetable for the REF that was set in June 2020 in response to COVID-19 altered our plans for further preparation stage meetings.

371. We recognised that there might be some disadvantage to new members and assessors in not being able to meet in person at the outset of their involvement in the process. To support their induction, we instead produced a detailed induction pack which linked to a pre-recorded webinar briefing providing an overview of REF 2021 and the role of a panellist, and held live webinar introductory sessions by main panel area. The main panel webinars provided a detailed introduction to the guidance and criteria for new panellists, as applicable within their main panel area, and gave the opportunity to hear from members of the main panel and to ask any questions about the assessment process.

372. In addition to these events, we also ran some virtual workshops for the impact assessors in January 2021, recognising that many impact assessors were

employed outside the HE sector and might be less familiar with the REF process. These half-day sessions provided an introduction to REF and impact assessment, provided the opportunity to hear the experiences of impact assessors involved in REF 2014, and allowed attendees to explore the assessment process using 2014 case studies in group discussions.

373. Two additional virtual meetings of the main and sub-panels were scheduled in November 2020 and January 2021. These were scheduled to additionally support the induction and integration of new members and assessors, to allow the panels to receive updates on the contingency arrangements being planned and on system developments, and to further plan the assessment phase in view of the changes to the workplan and meeting format necessitated by COVID-19. The January meeting also invited panels to begin developing their intention plans for maintaining fairness in REF assessment. There was also a round of panel IT training meetings in March 2021.

374. The revised approach to inducting new members and supporting panels to prepare for the assessment phase required significant resource to deliver within a short timeframe. A lot of this work was additional to that originally envisaged, yet there was very limited opportunity to draw on more resource to help the REF team. However, the work we put in was highly valued by new members and assessors, as indicated through the panel survey conducted at the end of the exercise. Of those responding who were appointed in late 2020 or after, 91 per cent reported very high or high levels of satisfaction with the induction materials, with comments indicating a general view that the induction was well handled in the circumstances.

375. The advisory panels also met during the preparation stage, with IDAP reviewing its detailed working methods and workplan, and providing advice to the panels on calibration. Advice from EDAP on EDI matters continued to be sought throughout all phases of the exercise, so in addition to work planning for the assessment phase, this panel also provided input on the updates to the EIA on contingency measures and further advice around equality-related issues during the assessment phase (including the development of intention plans).

6.1.3 Panel working groups

376. In the lead-up to the submission deadline, the REF team were undertaking contingency planning for the assessment phase of REF 2021, given that the uncertainty of the situation with COVID-19 meant we did not know when it would

be possible to resume face-to-face panel meetings – although we were aiming for September 2021. As part of this work, the REF team sought to explore the implications of virtual and/or hybrid meeting modes for panel meetings and assessment.

377. In February 2021 a working group was convened to discuss virtual assessment, comprising REF 2021 panel members who were also panel members for the virtually-conducted Hong Kong RAE 2020. The group were asked to reflect on their experiences of virtual assessment in the Hong Kong RAE 2020 and to discuss face-to-face, hybrid and fully virtual assessment scenarios for REF 2021. This work identified several opportunities and challenges with the virtual mode, and indicated particular issues around a potential 'hybrid' approach, whereby some members attended in person and others remotely.

378. In February 2021 we also convened a separate working group, comprising members from across the main panel areas, to provide advice on improving the confidential feedback statements for institutions. This aimed to respond to recommendations from the previous exercise that more consideration should be given to the value of the statements and ensuring the effort put in by the panels is broadly proportionate to this. The working group identified that the same sort of challenges would arise in producing feedback for 2021 as in 2014, but that more specific guidance, including templates and suggested phrasing would be useful in the guidance being developed by the REF team.

6.2 Assessment systems

Key points

- Our aim for the design of the assessment systems was to enable efficient and effective work by the panels and the REF team. However, by late 2020 the system designed on the basis of initial user research in 2018 and 2019 no longer reflected the way that working practices had changed over the course of the pandemic.
- The overall delivery of the assessment systems was challenging and was impacted significantly by the effects of COVID-19. There were several major issues encountered during the systems' rollout.
- Following resolution of early issues, the assessment systems functioned well. When surveyed, the majority of panellists reported positively on the effectiveness of the assessment systems in helping them carry out their role, although the comments also reflect some of the early issues encountered.

- Several challenges were encountered with the provision and use of USBs by both the REF team and the panellists, indicating that this approach to providing offline access was no longer fully fit for purpose.
- User support was provided by email, phone and a detailed user guide. Panellists felt that the support from the REF user support team was very good or quite good. Survey feedback also highlighted the major role played by the secretariat in supporting the panels.

Recommendations

- Commence development of the assessment systems alongside the submissions system, with dedicated, separate resource. This will also require earlier confirmation of assessment processes, with full input from the panels.
- Implement the panel communications system first (for the criteria phase), and ensure sign-on used for the communication system can be integrated with other systems.
- Move assessment data entry away from spreadsheets to become fully-online; investigation would need to establish whether local file syncing could be used to enable offline access.
- Consideration should be given to providing members with a REF device (for example, laptop), which would be returned at the end of the exercise.
- Move away from USBs and instead explore alternative solutions for offline working.

6.2.1 Overview of systems

379. The assessment systems for REF 2021 comprised:

- a. The Panel Members' Website (PMW), incorporating:
 - I. Spreadsheets: for scoring and managing assessment processes; supporting offline working (spreadsheets could be saved to universal serial bus drives (USBs), and uploaded back to system).
 - II. Reports: where members could access assessment-related reports, including comparison of personal scores and (for sub-panel executive members) reports on panel progress and scoring data.
 - III. Submissions viewer: each panel that a user was a member of was listed in the submission viewer and submitted data was available for viewing.
 - IV. My allocations and online scoring: in the submission viewer, a list of all items that were allocated to a panel member for assessment, and functionality to record scores and comments against each item online.

- V. Administration: functions to support panellists with the administrative aspects of their membership and meeting arrangements.
 - VI. Guidance: provided links to the panel guidance and other key information provided by the REF team, panel member FAQs and details of any known issues reported with the assessment systems.
- b. Calibration system: this was a separate instance of the PMW's spreadsheet functionality, which allowed spreadsheets to be generated and uploaded by members for reporting scores in calibration exercises.
 - c. Library: functionality for members to request physical outputs allocated to them and/or order printed copies of electronic material, view the loan status of allocated items, and view items on loan to them (see section 0 for more information on the library system).
 - d. USB sticks: encrypted USB pens which allowed panellists to access submissions and outputs. These were used as a secure place to store spreadsheets and allowed panellists to view items which they were allocated using links in their personal spreadsheets that could be downloaded from the PMW.
 - e. Webmail: a closed webmail system using MS Office 365, that enabled panellists (and the REF team) to communicate securely and confidentially on assessment matters between meetings. The accounts included Outlook messaging as well as Teams.

6.2.2 Systems development

380. Our aim for the design of the assessment systems was to enable the efficient conduct of the panels' work and to allow the effective management of the panel processes by the REF team, and effective oversight by main panels. We began to engage with the main and sub-panels on the design of the assessment systems during the criteria phase meetings and during 2019 we established a Panel User Group (PUG) to seek more detailed input.

381. The assessment systems PUG comprised representatives of each sub-panel and included members of the secretariat and REF team. It met twice in 2019 to input into the early systems design, and again in late 2020 and early 2021. The 2019 meetings underlined the need for offline assessment functionality and reported

positively on the spreadsheet and USB model adopted in REF 2014. However, working practices had changed substantially by late 2020, due to COVID-19, where additional requirements around an online scoring model were identified.

382. To support secure communications within the panels about assessment matters during the assessment year, we needed to introduce a closed messaging system that would, as far as possible, be interoperable with the wider assessment systems. We trialled an off-the-shelf messaging product during 2020 with main and sub-panel executive groups, to facilitate the process of making further appointments to the panels, which included gathering feedback and working with the external company to further develop the system in response.

383. Feedback on the trial was provided via PUG in late 2020, which confirmed that the messaging system did not meet the panel members' requirements. A strong recommendation was provided to move forward with procuring an email solution. The REF team then worked with UKRI digital services to deliver a restricted version of Outlook based on Office365, with rules in place to prevent emails being sent/received outside the system (except for certain specific cases such as emails to/from the audit system, and user support). This had the benefit of also providing Microsoft Teams for file sharing/collaboration; however, given the late stage of identifying this solution after the unsuccessful trial, we were not able to implement single sign-on to this REF webmail system with the wider assessment systems. When the panels were surveyed at the end of the exercise, 80 per cent of respondents felt that the webmail system was very good or quite good. However, where comments were provided, they did not necessarily reflect this broadly positive evaluation. Some questioned the need for a closed email system at all, while others raised issues around conflicts with organisational 365 accounts and the consequent difficulties with logging in, and issues with using Teams in a browser.

384. The PMW was in use throughout the exercise for member and meeting administration; the wider assessment system rollout commenced in late March 2021, with the new webmail system, and continued throughout the early months of the assessment phase. There were several major issues encountered during the rollout, which required a continuous period of intensive resourcing and negatively impacted the panels' progress during the initial stage of the assessment. These issues included:

- Login difficulties with the webmail system. The authentication model for the Office 365 online accounts precluded single sign-on with the PMW,

requiring members to separately login to access their REF webmail. This created some account authentication issues, conflicting with existing 365 accounts held by some members, and some interoperability issues with Teams and Safari.

- Issues with incompatibility and functionality for members using Mac operating systems, including with the USB authentication and use.
- Bugs and performance issues with the assessment spreadsheet functionality, including some user error, arising from the challenges of delivering training and support in a virtual context. This resulted in a high demand for user support, resulting in longer than average times for resolution.
- Allocation software functionality issues. This software was developed by a panel member for expert use within Sub-panel 11. It was rolled out across a wider set of panels, following engagement with sub-panel executive groups. However, it was very difficult to run without errors when rolled out to wider panel execs and was not written in the same coding language that the REF team used, which meant it was challenging to provide technical support.
- Library software had significant performance issues on launch, which resulted in its temporary withdrawal. See section 0 for more detail.
- Delayed delivery of full functionality, including features such as a 'daily digest' function that summarises REF webmail traffic in a notification to institutional addresses, due to the above issues.

385. In June 2021, we evaluated the systems issues encountered for reporting to the REF Steering Group. This identified several contributing factors that resulted in the release of systems that were not a whole, coherent suite (multiple logins required), that we were not able to comprehensively test within the timeframe for which they were required, and consequently which raised a volume of support requests that then impacted on response times. These factors included resourcing, with a tightly-specified development team that needed to respond to the additional COVID-19 mitigations required for the submissions system, and which diverted policy resource from refining requirements for assessment systems throughout 2020 and acutely in early 2021; a change to working practices due to COVID-19, which brought about new user requirements for online working in the assessment systems at a late stage (in December 2020); some technological challenges related to working in a cloud-based environment, which were amplified by the remote working context, particularly around the preparation of USBs; and equipment issues that hampered testing processes. Key

among the factors described here is the multiple ways that COVID-19 impacted on the exercise.

386. In noting the report, the REF Steering Group reflected that some issues were similar to those encountered during the 2014 systems rollout, but that were exacerbated by the additional challenge of the remote-working context.
387. Following resolution of these early issues, the assessment systems functioned well and we were able to respond to some additionally-identified user requirements (for example, around bespoke reports) as these arose during the period. When surveyed at the end of the exercise, 80 per cent of respondents reported positively on the overall effectiveness of the assessment systems in helping them carry out their role. The comments provided by respondents do highlight the high levels of frustration of the early weeks of the assessment phase and that initial performance of the system was inadequate, but also recognition that things did improve. Positive comments about the system were made, once the initial bumpy start had settled down. One particular area arising in comments was around the number of logins and separate components that made up the assessment systems, making it feel clunky and unintuitive.
388. Around half of the survey respondents used only spreadsheets and USBs for assessment, with 20 per cent reporting they worked solely online. The remainder used a mixture of both. The late stage at which the online scoring requirement was added to the systems design limited the extent to which the offline and online models worked seamlessly with each other. Pros and cons with both approaches were noted by survey respondents, as well as some difficulties in using the models together. Despite the greater move to online working in the virtual environment necessitated by COVID-19, 60 per cent of respondents still felt it was important to be able to work offline, with only a small minority feeling there was no need for offline working at all.
389. The overall delivery of the assessment systems was challenging and was impacted significantly by the effects of COVID-19. Our initial engagement with users of the assessment systems in 2018 and 2019 led to the design of a system that by late 2020 no longer reflected the way that working practices had changed over the course of the pandemic. There are several recommendations for a future exercise that seek to draw as far as possible on our learning from the challenges we encountered:

- Commence development of the assessment systems alongside the submissions system, with dedicated, separate resource. This will also require earlier confirmation of assessment processes, with full input from the panels.
- Implement the panel communications system first (for the criteria phase) and ensure the sign-on used for the communication system can be integrated with other systems.
- Assessment data entry is moved from spreadsheets and becomes fully-online; investigation would need to establish whether local file syncing could be used to enable offline access.
- Consideration should be given to providing members with a REF device (for example, laptop), which would be returned at the end of the exercise. This would be more expensive than USBs, but would present significant benefits in terms of risk mitigation against potential data loss, and would ensure full compatibility across the developed systems.

6.2.3 Distribution of electronic outputs and submissions

390. In response to early input from PUG, and in view of the need to support assessment activity offline, we followed the 2014 approach of using USBs to provide electronic submission data to panellists. This was in addition to the online access they had via the submissions viewer.

391. Due to the variety of device types that panellists would be using, we needed to provide USBs with hardware-based encryption; however, this introduced particular challenges for the REF team in loading the USBs with data, due to their incompatibility with UKRI devices. Security restrictions preventing use of the USBs on panellists' devices also affected a greater proportion of members in this exercise, reflecting the wider technological changes seen since the 2014 exercise. In these instances, we had a number of options to work through with panellists, to ensure they could access electronic material securely. This included providing a REF laptop in a small number of cases.

392. Estimates were made of the storage capacity required for each UOA and in early 2021 we procured 1,280 USB pens with capacities ranging from four to 64 GB. In March 2021, two temporary staff were appointed to support the REF admin team in loading the USBs following the submissions deadline.

393. The delivery of the USBs was challenging for the REF team, not least because of the need to circumvent UKRI devices. A schedule had been drawn up by the REF

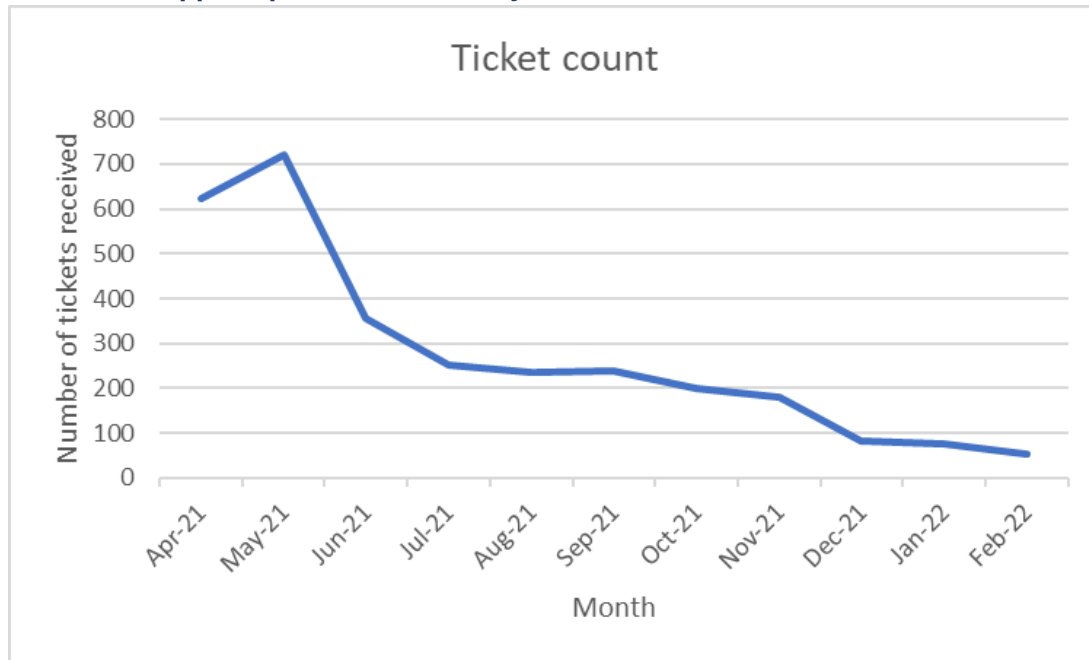
admin manager for this process; however, the issues encountered with PDF retrievals, and the subsequent steps needed to rectify this in the period immediate post-submission, necessitated a revision to the schedule. This schedule staggered the population of the USBs according to when the data was anticipated being complete for each UOA. We also staggered the delivery by role, prioritising sub-panel executive groups and delaying provision to impact assessors, whose roles were due to commence in full only later on in the assessment year.

394. The remote-working context in place for most of the team also added challenges to the process, as the terabyte drives that were being used by the admin and temporary staff to populate the USBs in RE's office first required preparation and loading by our remote-working development team. Due to these issues, there were delays in the dispatch process, although the majority of panellists received their USBs within the first three weeks following the submission deadline.
395. To help panel members work efficiently with the large volumes of data contained on the USB pens, a browser-based index was provided on each USB pen following the 2014 model but with updates appropriate to the 2021 submissions. Panellists' personal spreadsheets were designed to include direct links from each item they had been allocated, to the relevant PDF document stored on the USB pen. As noted above, there were some ongoing challenges in enabling this functionality for Mac users, due to updates to the Mac security system that sandboxes URLs in Excel spreadsheets.
396. During the assessment phase some USB pens were lost or accidentally wiped of data. In these instances, a replacement was provided by the REF team – with the admin team liaising with the library team (who were onsite) to repopulate and dispatch the sticks. Sticks that were accidentally wiped were returned to the REF library team. A log of all lost data was maintained. Panel members were required by the REF confidentiality arrangements to return their USB pens at the end of the assessment period. Some were collected at the final sub-panel meetings, where these were held in person. The remainder were collected by sending out envelopes to panellists for returning the USBs. Instructions were provided to members on first wiping sticks, prior to sending these back.
397. The nature of the challenges encountered with the USBs by both the REF team and the panellists indicates that this technical solution for providing offline access

to submissions was no longer fully fit for purpose. This is reflected to some degree in the panel members' survey, where around 60 per cent of respondents felt the USBs were good or very good, showing around a 20-percentage point decline in satisfaction levels since 2014. Qualitative feedback suggested a greater desire for online document sharing. It is recommended that USBs are not used and that alternative solutions are instead explored for offline working in a future exercise.

6.2.4 Training, guidance and user support

398. Our original plans for providing panel training on the assessment systems needed to be revised in light of the remote-working context necessitated by COVID-19. We repurposed an originally scheduled meeting round in March 2021 to provide webinar-style introductory training on the systems for panel members and assessors. We then provided dedicated virtual training sessions for the sub-panel executive groups on the more detailed functionality of the exec-level panel spreadsheets for managing and monitoring the assessment process. Additional demonstrations and support sessions were typically provided in preliminary sub-panel meetings by the panel secretariat.
399. To support use of the systems, the development team produced a detailed user guide that was updated throughout the process as new functionality was added. In addition to the user guide, several training videos were produced to guide panellists through some aspects of the systems that users were finding more difficult to navigate. For some issues, virtual drop-in sessions were held by user support to provide further guidance and instruction.
400. More widely, user support was provided by email and phone by two full-time members of staff. This later reduced to one staff member. Additional resource was needed to support management of the queries in the initial period of the assessment phase. Figure 3 shows the number of queries received during each month of the assessment phase, with a peak in May 2021 at 719 tickets as the phase got started in earnest and some of the issues in the initial systems delivery became apparent (see section 0). Across the different aspects of the assessment systems, spreadsheets/USBs generated the most user support queries. The webmail system generated the second highest number of queries.

Figure 3: User support queries received, by month

401. When surveyed at the end of the exercise, 80 per cent of respondents felt that the support from the REF user support team was very good or quite good. This sentiment was reflected in the comments received, which were generally positive and gave particular feedback around the calm, prompt, and very supportive nature of the individuals in the user support team. The survey also showed the major role played by the secretariat in supporting the panels, with proportionally more users receiving support from their secretariat (70 per cent) than from REF user support (50 per cent). This significant role was also underlined in the comments received.

402. In the end of exercise survey panellists also reflected positively on the guidance, training and the videos the team delivered. However, it was clear that the virtual context negatively impacted use of the systems in the initial period. Members did not have the same opportunities to share experiences and receive ad-hoc training that in-person meetings had provided in 2014. This tended to place a higher resource call on the secretariat to provide support and guidance, as noted above.

6.3 Panel secretariat

Key points

- During the assessment phase, main panel teams of panel advisers and secretaries supported the work of the panels.
- The REF team ran secretariat training and feedback sessions throughout the assessment phase to support this work, with some adaptations required to suit the virtual format.
- Throughout the assessment, the secretariat provided excellent levels of support to the panels in what were often very difficult circumstances due to the ongoing pandemic. Feedback from the panels was overwhelmingly positive about the secretariat support received.
- Helpful feedback from the secretariat on the delivery of the exercise was shared at a final feedback meeting in March 2022.

403. During the assessment phase, the main role of the advisers was to provide high-level support and procedural guidance to a main panel and a group of sub-panels during panel meetings, and to support the work of panel chairs within the stated rules and procedures of the REF. The main role of the secretaries was to provide high-quality committee servicing support to up to two REF sub-panels and to carry out a range of tasks to ensure the panels' assessments progressed to schedule. Information about the secretariat recruitment is set out in section 0.

404. Each main panel was assigned a team of three to four advisers and a team of secretaries, with the number of secretaries varying based on the number of sub-panels within the main panel, and the working pattern of the secretaries (full time or part time). We mapped secretaries and advisers to sub-panels by considering any discipline preferences expressed, through mapping individuals across (and not within) sub-panel clusters to ensure availability for all meetings, and by seeking to minimise the number of different individuals each sub-panel would work with in an adviser-secretary pair. Because some secretaries were part time, and due to the reduction in each secretary's allocation of sub-panels from three in 2014 to two in 2021, it was unavoidable for the most part that advisers were working with more than one secretary, and meant in some cases, secretaries worked with two advisers. This added some complexity to the processes for managing the panels' work.

405. We ran secretariat training and feedback sessions throughout the assessment phase. These were primarily in virtual format and, responding to feedback received about the whole-day format of initial sessions at the start of the

assessment phase, these were usually scheduled as half-day meetings. We commenced training with orientation and induction for the new members of the secretariat in November 2020, in advance of the first round of preparation meetings. This session was followed by a further training session in December to reflect on the first and prepare for the second round of preparation meetings, as well as looking ahead to the assessment year. These sessions provided an opportunity for the REF team to run through the guidance prepared for the secretariat (for example, on panel processes and meeting procedures), and also built in time for the main panel teams of secretaries and advisers to gather in groups for introductions and planning.

406. Further training and feedback sessions held from April 2021 focused on specific aspects of the assessment processes (including audit, impact and cross-referral) provided training, templates and briefings for aspects where the secretariat needed to brief or guide the panels, and again provided opportunities for break-out discussion in main panel teams to facilitate sharing of ideas and planning. While these meetings did provide opportunities for information exchange and central guidance both between the secretariat and REF team, and among the secretariat themselves, there was much less opportunity for informal discussion and exchange than had been provided through the in-person secretariat and panel meetings in the previous exercise. Feedback gathered from the secretariat at the end of the exercise highlighted some feeling that more sharing or co-ordination across the secretariat would have been beneficial.
407. The secretariat fed back that they found engagement with the REF team and their responsiveness during the assessment phase helpful; however, the resourcing pressures within the team created some challenges and meant that guidance was sometimes provided at a later stage than would have been preferred. There was also feedback noting that it was challenging to provide IT support to panel members at the outset when the secretariat did not have access to the same systems 'view' as the panellists. Responding to this issue, the development team provided the secretariat with access to the test systems.
408. Throughout the assessment, the secretariat provided excellent levels of support to the panels in what were often very difficult circumstances due to the ongoing pandemic. Their investment in the process and commitment to it throughout was critical to the successful conduct of the exercise. When surveyed at the end of the exercise, 95 per cent of respondents rated the secretariat support as very good, with the remaining 5 per cent rating it as quite good. The comments widely

underlined this picture, with a significant volume of comments made about their helpfulness, professionalism and supportive approach.

409. We held a final feedback meeting with the secretariat in March 2022, to gather reflections and learning from the process. Their experiences and some of the key issues resonated with several of those outlined elsewhere in this report. Systems issues were flagged, with some support for online-only processes in future and reducing or removing use of spreadsheets for managing panel processes, as well as greater input from the secretariat being needed on the systems design. Feedback was also provided on the meeting scheduling, with meetings feeling too closely spaced or not quite timed right. On panel processes, the most amount of feedback was provided on the management of cross-referral as the webmail-based approach was felt not to have worked well, with support given for this to be more integrated with the online system in future. With regard to meeting format, there was clear feedback that the Zoom meetings had worked well, although there was some feeling that more training could have been provided early on. While feedback on panel hosting was generally positive – particularly in the earlier stages, when this was resourced from within RE – it was suggested that this was not really needed or as useful in the later stages.

6.4 Panel guidance and policy support

Key points

- The REF team produced panel guidance and training in a mix of formats to support consistency in assessment processes and procedures, and provided policy support through attendance at main and sub-panel meetings.
- Panel survey feedback on the panel guidance showed high levels of satisfaction, although with some feeling that there was too much guidance in total.
- Online training on 'Fairness in REF assessment' was provided as part of a wider approach that also included the development of intention plans. These measures were widely welcomed by panels.

410. To promote consistency across the exercise in applying the guidance and criteria, and to ensure panels and the secretariat had access to the resources needed for the assessment, we produced or co-ordinated a range of panel guidance and training to support assessment processes and procedures. Much of the written guidance was provided as papers for panel meetings, as well as being posted in the guidance section of the PMW where members could access the full range of documents, webinars and training videos. We also provided systems guidance, with further information set out in section 0.

411. In addition to published documentation (including conflicts of interest and confidentiality arrangements), the procedural guidance documents we produced included:

- Guidance on participating in virtual meetings
- Further detail on panel procedures for declaring minor conflicts, in addition to the conflicts guidance published in the 'Panel criteria'
- Guidance on the procedures for seeking specialist advice
- Guidance and FAQs on ordering physical outputs
- Procedures for raising audit queries
- Calibration principles for IDR, comprising advice from IDAP
- Guidance on the procedures for cross-referring outputs
- Guidance on the procedures for jointly assessing IDR-flagged outputs
- Further detail on the role of IDR advisers, to complement the published protocol
- Guidance on producing the panel overview reports and confidential feedback
- Guidance on the deletion and disposal of assessment material

412. The assessment guidance and training included a mix of documents, webinars and videos, some of which were only applicable to some main or sub-panels. This guidance and training included:

- An updated briefing document on equality and diversity issues in the REF, from EDAP
- An e-learning module on 'Fairness in REF assessment', developed by consultants
- Guidance documents on using the citation data (for those sub-panels using it in the assessment) and advice on bibliometrics, developed with our citation data provider Clarivate
- Summary guidance document and presentation on assessing case study eligibility and accessing corroborating evidence
- Guidance document on environment templates and data, including note in relation to research income-in-kind issues
- Webinar on best practice in animal research (Main Panel A only), developed with the NC3Rs
- Webinar on impact on policy, developed with the Parliamentary Office of Science and Technology (POST)

413. Panel survey feedback on the panel guidance showed high levels of satisfaction among respondents, with 94 per cent expressing very high or high levels of satisfaction. In the comments provided, a common response was that the quality of materials was generally good, but that there was too much guidance in total, across too many different sources (which could have been consolidated). Conversely, a number of responses commented on the thoroughness and breadth of materials, noting that this had helped them to feel well prepared, with others noting that this was very welcome given the need to work online. There were a mix of views on the value of different formats (for example, the videos).
414. The 'Fairness in REF assessment' e-learning module was a mandatory training course that had been rolled out to all panel members during 2020. We commissioned the training following the success of the tailored unconscious bias training we ran for panel chairs during the criteria phase. During its development, the consultants engaged closely with EDAP, which was the first panel to undertake the module. The training was part of the wider approach to considering fairness in the assessment process, which also included the development of main and sub-panel intention plans. We worked with EDAP to provide guidance to the main and sub-panels on the initial development and use of these plans throughout the assessment phase.
415. These measures were widely welcomed by panels. The main panel overview reports provide more detail about their implementation during the assessment and an example intention plan is included in EDAP's final report⁶³. Just under 80 per cent of panel members who responded to the question in the panel survey thought that the bias mitigation measures (including the training and intention plans) were either quite or very effective. Some differences are observable across main panels, with members from Main Panel D showing the highest proportion of respondents who reviewed the measures as 'very effective' (50 per cent), compared to 37 per cent of members from across Main Panel B.
416. To further support the panels in the consistent application of the guidance, members of the REF policy team drew up a schedule for attending the main and (parts of) the sub-panel meetings. The virtual meeting format to some extent helped us to visit a wide range of sub-panels across the meeting

⁶³ See www.ref.ac.uk, under 'Publications and reports' for the overview reports and EDAP's final report.

rounds; however, there was less opportunity to engage in informal discussion with the panel members and secretariat, through which a broader form of information exchange can take place. The REF director or Head of REF Policy attended all main panel meetings throughout the exercise, and the REF director chaired the meetings of the main and advisory panel chairs (MAP) group. Further measures in place to support consistency in the application of the guidance and in assessment standards are described in section 0.

6.5 Meeting format

Key points

- Decisions on meeting format constantly evolved across the assessment phase, as we sought to respond to the uncertain and changing context presented by COVID-19.
- Panels began to hold some hybrid meetings from September 2021, with decisions taken at a sub-panel level for meetings from November onwards.
- Across the November/December 2021 rounds eight sub-panels met in hybrid format; 22 hybrid meetings followed for the final meeting rounds in February 2022.
- Panellists generally reported positively on their experience of participation in virtual meetings, although a range of advantages and drawbacks were identified. The importance of holding some in-person meetings in future was emphasised.

Recommendations

- Give early consideration to the most appropriate balance of virtual, hybrid and in-person meetings for a future exercise, drawing on the learning from REF 2021.

417. During our contingency planning work in 2020, in response to the effects of COVID-19, we considered the initial approach to meeting format in the assessment year. In its autumn 2020 review meeting on the wider set of COVID-19 mitigations in place for the exercise, the REF Steering Group agreed that September 2021 would be the earliest feasible date for returning to in-person panel meetings. This was in view of the expected continuation of COVID-19 restrictions well into 2021 and the impact of uncertainty on our ability to arrange venues and accommodation in an earlier period.

418. In the period that followed this first decision, the REF team undertook a range of activities to inform the funding bodies' next decision on the best timing for returning to face-to-face meetings in light of prevailing restrictions at the time. These activities included exploration of the feasibility of virtual assessment via a

virtual meetings working group (see section 0); discussions with the Hong Kong RAE 2020 team (as that exercise had moved to entirely virtual format); seeking advice from the MAP group; and a survey of panel members in May 2021 to understand their perspectives on returning to face-to-face meetings.

Consideration was also given to budgetary matters, including the potential for increased costs associated with COVID-19-safe meeting planning (such as larger venue spaces, reimbursing private travel); and wider contextual factors, including the timing of the COVID-19 vaccination rollout, risks around seasonal waves and potential new variants, and international travel restrictions.

419. These activities, in summary, indicated the feasibility of virtual assessment (with the feeling at the outset that this was more feasible for outputs than for other elements), with the need for some revisions to the approach – for example, shorter meetings, more sub-group work and so on; concerns about the feasibility of hybrid meetings (with a mix of online and in-person attendance); and a mix of views around the possibility and desirability of returning to in-person meetings in the autumn. The May survey of panel members received 815 responses. Of these, approximately two thirds indicated that they would feel comfortable or very comfortable travelling on public transport and attending face-to-face meetings from September 2021 and just under 20 per cent were either uncomfortable or very uncomfortable with this. Generally, those less comfortable with returning to face-to-face meetings suggested more mitigations and measures that could be put in place if face-to-face resumed, such as ventilation and masks.

420. In view of the evidence provided and range of factors under consideration, the REF Steering Group agreed in May 2021 that a return to in-person meetings should be planned for the November/December 2021 meeting round, with September meetings remaining virtual. This was primarily based on the expected timing of the vaccine rollout with (at that stage) October considered to be the earliest point at which all of those involved in in-person meetings (including panel members, secretariat and REF team) would have been offered both doses of the vaccine and have had the 3-week post-vaccine period. The decision also took account of several unknowns at the time of decision-making, including the effects of new variants on overall infection rates and hospitalisations, and timeframes for changes to recommended guidelines on social distancing for events such as panel meetings, which were felt to hamper effective planning for September in-person meetings. The steering group were also mindful of the proportion of panellists (including those from, or who were carers for, vulnerable groups) who

were not comfortable returning to in-person meetings and the likely hybrid format that would follow in consequence.

421. In response to a request from one main panel to review the decision, the steering group met again in June 2021 to consider the issue. While the outcome of the review meeting confirmed the original decision, the group committed to looking at the feasibility of supporting small group meetings (for example, having the sub-panel executive groups meeting in person) from September in view of anticipated changes to the COVID-19 restrictions in the summer of 2021. This was later confirmed as feasible, and a small number of sub-panels opted to hold the September round of meetings with the executive group in person and the remainder of the panel attending virtually. Due to changes in the prevailing conditions, a handful of panels also met in person for meetings scheduled during October 2021, with at least some members attending virtually across these. The October meetings provided a helpful test case for the hybrid format.
422. From the November round onwards, decisions in relation to meeting format were taken at sub-panel level, reflecting steering group agreement that it would be appropriate to allow variation on this point. Previous decisions in relation to format had underlined the importance of retaining consistency in meeting format across the exercise. However, data gathered in September from the sub-panel executives indicated differences in how meeting effectiveness could best be achieved, depending on the scheduled business and expected attendance of panellists for each sub-panel – for example, if the majority of impact assessors were not expected to attend in person at a scheduled impact meeting, a virtual meeting was considered preferable. We had also surveyed members again in September 2021, which overall indicated around a 50 per cent expected attendance rate at sub-panel meetings in person, but with considerable variation in this at sub-panel level. It was also recognised that all notionally 'in-person' meetings would in effect be hybrid meetings and therefore require equipment to facilitate members joining virtually.
423. In the event, in-person meetings scheduled for January 2022 needed to switch to virtual format in view of increasing COVID-19 infection rates and consequent changes to UK government guidance in relation to the Omicron variant, requiring a return to working-from-home. This decision needed to be taken at short notice, in December 2021, in response to the evolving effects of the new COVID-19 variant.

424. Across the November/December 2021 rounds eight sub-panels met in hybrid format. A greater number of panels (including main panel chairs, main and sub-panels) then met in hybrid format across the scheduled February and March 2022 rounds, when the COVID-19 restrictions had again eased, totalling 22 hybrid meetings in this period. The advisory and pilot panels also started to return to in-person format in this period, with ILEPP, EDAP and IDAP holding hybrid meetings in either February or March. We were also able to hold the final secretariat 'wash up' meeting in person in March 2022.
425. To support panellists attending in person, we produced an infographic containing guidance in relation to COVID-19 measures. The guidance recommended the use of face coverings, lateral flow testing prior to attending, not attending where any COVID-19 symptoms were present, and gave advice on travel, minimising the spread of infection, and on equipment necessary to participate in hybrid format. Links were also provided to relevant guidance and any local policies in place within the meeting venue.
426. As summarised above, decisions on meeting format constantly evolved across the assessment phase, as we sought to respond to the uncertain and changing context presented by COVID-19. This proved to be an extremely challenging position from which to plan the necessary arrangements for panel meetings – both where these were being held in person and virtually (due to the need to identify and confirm panel hosting requirements). Further detail about the administrative processes around these meetings is set out in section 0.
427. During 2020, when we were exploring contingency arrangements for the assessment year, the REF Steering Group agreed to the provision of a new support role for virtual panel meetings. Panel hosts were administrative roles, aimed at supporting the secretariat with managing the functionality of online meetings. We experienced real challenges in successfully recruiting to these roles, which ultimately placed a heavy burden on the REF team in providing resource for this function in the preliminary meeting rounds. The administration arrangements required around the hosting proved very challenging due to the late-stage decisions in relation to meeting format. Further detail on this is set out in section 0.

428. In the end of exercise survey, we asked panellists to rate their experience of participating in virtual meetings and, if they had joined a hybrid meeting, of participating in person and/or online (as applicable). Table 3 summarises the responses received.

Table 3: panellist experiences, by meeting format

	Virtual meetings (n=502)	Where attending a hybrid meeting:	
		In person (n=237)	Online (n=189)
Very positive	27%	54%	18%
Quite positive	42%	33%	44%
Neither positive nor negative	14%	6%	18%
Quite negative	13%	6%	17%
Very negative	4%	0%	3%

429. Across all types of participation, the majority of respondents expressed positivity about their experience, although this is notably higher (at 87 per cent) for those joining hybrid meetings in person, than those joining online (62 per cent). The relative success of the virtual panel meetings (held for the majority of the assessment phase - and for some sub-panels, for all of it) is shown in the proportion of panellists (70 per cent) who reported positively on their experience of participation.

430. Over 200 respondents provided comments on the meeting format, which highlighted a range of views. The most frequently made comments related to some of the challenges of online meetings, including a more transactional approach, making it harder to have difficult or nuanced conversations, being tiring to participate in, limiting relationship-building, allowing more 'dipping in and out' of members, and being harder for assessing impact and environment in comparison to outputs. A number of panellists described the virtual process as less enjoyable than previous face-to-face experience, or that they missed the networking and social aspects of panel meetings. The other area most frequently raised related to the challenges of participating online in a hybrid meeting, where sound and other technical issues were experienced, as well as making participation feel unequal.

431. However, a high number of comments were also received on the benefits of the virtual meetings, including their greater efficiency in process and in members'

time (not travelling), flexibility, a more levelling nature of discussion, environmental benefits, and being more family-friendly. A number of comments emphasised the positive experience of virtual meetings, sometimes reflecting that this had been surprisingly the case. Effective chairing was seen as key to a positive or successful experience in several comments. A range of comments highlighted how the virtual meetings worked by necessity of the circumstances, but that in-person meetings were generally preferable or more effective.

432. Where comments reflected on a future process, the majority of these indicated that some element of virtual could be considered for some aspects of the process, but that it would be important to retain in-person meetings. In planning meetings for a future exercise, the funding bodies should give early consideration to the most appropriate balance of virtual, hybrid and in-person meetings, taking account of the need to ensure effective panel integration and provide opportunities for the wider benefits of membership to be felt, as well as building on some of the successful elements seen in the REF 2021 virtual meetings.

6.6 Assessment process

Key points

- Key assessment processes across all three elements included calibration and allocation of materials. New systems were provided to support these tasks, with some mixed experiences and lessons identified for future.
- Calibration exercises were effective in supporting panels reach a common understanding of assessment standards.
- Key challenges were identified by the panels and secretariat in the processes to support the cross-referral and joint assessment procedures, where more integration with the wider systems was desired.
- The assessment process was completed on time; however, some flexibility in individual sub-panel schedules was required in view of COVID-19 effects, and some additional meetings were held to support completion.
- The main and sub-panel structure continued to be an effective model for ensuring effective oversight and consistency in standards. The more formalised use of the main and advisory panel chairs' group added to this model, and provided a clear and responsive route for seeking rapid panel input at key points.
- The workload involved in being a REF panellist continues to be high and, due to the effects of COVID-19, some panellists experienced changes to the level of time relief offered by their employing institutions.

Recommendations

- Build in calibration functionality into the assessment systems from the outset, seeking to ensure sufficient clarity and differentiation for members from the main assessment system.
- Allocation processes should be considered closely alongside submission requirements to enable collection of appropriate submission data
- Explore allocation requirements with panellists during early assessment system design, to enable the earlier incorporation of automated approaches into the wider systems.
- Work with the panels and the secretariat to identify user requirements for cross-referral and joint assessment at an early stage in systems design.
- Consider providing a 'live' version of the standard analyses for panels that links directly to the submissions data, to include data amendments; however, consideration will need to be given to how any amendments are flagged to panels.
- Explore the feasibility and benefits of a more granular method for scoring the environment in a future exercise.
- Consider whether to require a more formal commitment to supporting panellists' time from institutions at the nominations stage, in the same way as was required for main and sub-panel chairs.
- Review the approach to engagement between EDAP and the sub-panels – potentially exploring a network model, as we had in place for IDR.
- Consider resourcing the management of the IDR network through dedicated resource, or alternatively as part of the IDAP secretariat where this is on a secondee basis.

6.6.1 Outputs

433. Following the agreement reached earlier in the exercise to follow a common sequence of assessment, all panels commenced the phase with output assessment. This incorporated several stages, which are set out in this section. Further details about the detailed processes followed by each of the main and sub-panels is set out in the main panel overview reports⁶⁴.

Calibration

434. All panels undertook an output calibration exercise to reach a common understanding of the quality levels and to identify key assessment issues for discussion. The process started with each main panel first calibrating assessment standards, before each sub-panel conducted its own exercise. A cross-main panel exercise was also conducted after all main and sub-panels had concluded their exercises. See section 0 for further detail. Detailed plans for the calibration exercises were developed during the 2020 preparation meetings. The calibration

⁶⁴ Available at www.ref.ac.uk, under 'Publications and reports'.

exercises were very valuable in establishing comparable standards of assessment and in resolving assessment issues arising.

435. While the purpose of the calibration exercise was shared across the main panels, there were some differences in how these operated at a detailed level. Main Panel A, for example, used internationally-authored outputs that were not submitted into REF. This allowed them to undertake their calibration early on in April 2021, prior to the distribution of submissions. To support Main Panel B's process, the REF team helped prepare a randomly selected longlist of outputs from among submitted material, using key criteria agreed in the preparation meetings. From this longlist, the main and sub-panel executives selected the shortlist for use in the calibration exercise.

436. To support the new assessment processes and guidance in relation to IDR, IDAP provided advice to the sub-panels on calibration, with IDR-flags being one of the key criteria for inclusion of outputs in calibration samples across sub-panels.

437. In response to feedback from the secretariat about the manual requirements embedded in supporting calibration processes, we deployed a further version of the PMW's assessment functionality that could be used for calibration. This enabled members to download personal spreadsheets with the details and links to the calibration sample, and to upload these back to the PMW. Where used, this system saved the job of manually distributing details and collating scores. However, some issues were encountered when members were still becoming familiarised with the systems and mistakenly uploaded calibration scores to the main PMW. While this had no effect on the main assessment database, it caused some delay and confusion in the calibration process. In a future exercise, the funding bodies should build in calibration functionality from the outset, seeking to ensure sufficient clarity and differentiation for members.

Allocation

438. The allocation of outputs to panellists for assessment was a significant task for the sub-panel executive groups at the outset of the assessment phase. Detailed approaches to allocation had been considered in the assessment preparation meetings. The panel spreadsheets provided flexibility for each sub-panel to do the allocation according to these agreed working practices, although it remained a significant task.

439. Mechanisms to avoid major conflicts of interest during the allocation process were in place. Each panel member declared their major conflicts on the PMW; the spreadsheets used by chairs and deputies to allocate work prevented any item from being allocated to a member with a major conflict. However, it became clear during allocations that not all members had listed their current employer as a major conflict on the PMW, as it was assumed this would be automatically accounted for; consistent messaging via the secretariat was required at panel meetings to ensure this information was updated by members. Minor conflicts of interest were dealt with on an ad hoc basis throughout the allocations and early output review processes.
440. When work had been allocated (or a sufficient proportion of allocations completed) the personal spreadsheets for panel members were released, allowing panellists to review their list of allocated items. Access to the outputs was provided through the USBs and online through the submission viewer.
441. Following precedent from REF 2014, Sub-panel 11 used bespoke software to allocate outputs, which was written by a panel member. The potential value of this was recognised by other sub-panels and work commenced with the member from Sub-panel 11 and the REF development team to integrate the software with the assessment systems so it could be rolled out more widely. There were technical challenges with this, which are described in section 0.
442. Through a period of liaison with the REF team prior to the assessment year, sub-panel executives had decided whether or not they would use the allocation software. Where they chose to use it, data on expertise then needed to be gathered for all sub-panel members and output assessors to input into the algorithm. Sub-panels that did not already have an allocation field for outputs included as part of the submission requirements found it more challenging to use the software, as outputs first had to be categorised via another method before the algorithm could be run. In a future exercise, allocation processes should be considered closely alongside submission requirements to enable collection of appropriate submission data. The funding bodies should also explore allocation requirements with panellists during early system design, to enable its earlier incorporation into the wider systems.

Cross-referral and joint assessment

443. During the process of allocation, or as identified thereafter by individual panellists, sub-panel executive groups identified which outputs should be cross-referred to other sub-panels for advice and, for IDR outputs, where joint assessment was required. These decisions were often taken by or with advice from the sub-panel's IDR advisers.
444. The assessment system generated spreadsheets listing the outputs identified for cross-referral or joint assessment to each sub-panel, which the chairs of the advising sub-panels used to specify which individuals on the sub-panel would provide the advice. When allocations were made by the advising panel, the system generated a REF webmail message to invite the individual to provide advice on each output. The output was added to the allocated panellist's 'reading list' online and the record linked to from within the webmail message. After reviewing the output, or engaging in the joint assessment process, advice was provided by replying to the webmail message.
445. In view of the high volume of cross-referrals from Sub-panel 17 to 16, we agreed a bespoke process that would avoid generating excessive volumes of webmail messages to those allocated items within Sub-panel 16. This was based on manual upload of the cross-referral spreadsheets into the assessment system by the development team.
446. The secretariat and panellists identified clear issues with the cross-referral and joint assessment processes, particularly around the need to manage and track requests through webmail. When surveyed at the end of the exercise, relatively lower proportions of respondents (to whom the question was applicable) rated as quite or very effective the processes for cross-referral (60 per cent) and joint assessment (58 per cent) compared with other aspects of the exercise. Comments expressed concerns around the manual processes, indicating that they were complicated, unwieldy and time-consuming. Suggestions were made to integrate the process more with the spreadsheets in future exercises or provide more automatic systems to remove pressures from the secretariat in managing these requests. Some comments also highlighted the late stage at which some requests were made, reflecting the different schedules in place across the main panels for completing the assessment of outputs. To address these issues, and to avoid the need for a bespoke approach for bulk cross-referrals, in future, the

funding bodies should work with the panels and the secretariat to identify user requirements at an early stage in systems design.

447. The total number of cross-referrals in REF 2021 was 6,340, which shows some increase since the previous exercise (5,248). Main Panel C cross-referred the highest number of outputs, although the majority of these were the bulk cross-referrals from Sub-panel 17 (Business and Management Studies). The main panel overview reports provide more detailed data on cross-referrals at UOA level.
448. A much smaller number of outputs were requested for joint assessment (523). Despite our efforts to further clarify the joint assessment process in the IDR protocol and in the assessment guidance for panels, there remained some uncertainty about the distinction between joint assessment and cross-referral. As noted in IDAP's final report,⁶⁵ feedback from sub-panels indicates that joint assessment should be retained for future exercises, although with further guidance and processes that are more integrated within the assessment systems.

Specialist advice

449. Specialist advisers were appointed to provide advice to the sub-panels on outputs in languages other than English (or where the output contains a substantial amount of code, notation or technical terminology analogous to another language), and / or English-language outputs in specialist areas, that the panel was otherwise unable to assess.
450. We had collected information on language competencies through the nominations forms and sought to update and refine these data with appointed members in advance of the assessment year. This provided a database of language competency and expertise that sub-panels executives could reference when considering how best to meet identified assessment requirements. Cross-referral was used where appropriate expertise already existed among the appointed membership.
451. We appointed 38 specialist advisers in REF 2021, who supported the assessment of outputs submitted in languages including Arabic, Basque, Bulgarian, French, German, Greek, Hebrew, Hindi, Irish Gaelic, Italian, Japanese, Latvian, Mandarin, Norwegian, Romanian, Scottish Gaelic, sign-language, Tamil, Turkish, Urdu and

⁶⁵ Interdisciplinary Research Advisory Panel: final report', available at www.ref.ac.uk under 'Publications and reports'.

Welsh. While some were appointed in advance of the submission deadline, following panels' review of the survey of submission intentions, we needed to appoint a number of specialist advisers during the assessment phase in response to panels' requirements.

452. Specialist advice was requested by sub-panel executive groups using the panel spreadsheet. Requests were agreed by the REF director – including where the request required a new appointment – and outputs allocated to the relevant adviser in the system. Due to delays in the delivery of the assessment systems, the approval process remained a manual one, requiring a member of the development team to extract requests directly from the system and to feed the allocation data back in when approvals had been given. When they had been allocated material for review, specialist advisers were notified about this via webmail, linking through to the submission viewer to access the outputs. Advice was then returned to the sub-panel via webmail.

Panel progress and agreeing scores

453. During the assessment preparation stage, each main panel had set interim deadlines for the completion of assessment work, which would allow the main panel to effectively perform its oversight role. In view of the challenges presented by COVID-19, however, there was some flexibility around meeting these at individual sub-panel level.

454. Panel progress was reviewed by the sub-panel executive groups using reports available on the PMW and routinely considered at sub-panel meetings. There was some variation across the sub-panels in the progress of output assessment, reflecting some of the different challenges experienced by panellists in this period. The flexibility afforded by the virtual meeting format allowed sub-panels to add in further meetings to finalise output assessment where progress was delayed.

455. The detailed processes for recording individual and agreed panel scores varied by sub-panel in accordance with their working methods. The design of the personal and panel spreadsheets was aimed at being flexible, to support the differences in methods followed. However, some sub-panels found this flexibility – with the need to tailor the use of the spreadsheet to the panel's needs – difficult to work with, particularly around the approach for recording agreed scores between reviewers.

456. To identify score discrepancies, a report was provided to panellists in the system, which enabled reviewers to see their pair's scores and comments when their own scores had been uploaded to the system. In some cases, panellists found it difficult to work across the reports and personal spreadsheets during the score reconciliation process. In response to feedback on this issue, the user support team provided additional video guidance for members on using the report. Overall responses to the panel survey indicates broad satisfaction with the personal spreadsheets for recording scores and comments, with 74 per cent rating them as quite good or very good. In feedback comments, some of these difficulties in using the spreadsheets to reconcile scores are reflected, with some suggestions for automating this in future.
457. In approaching systems design in a future exercise, the funding bodies will need to explore with panels where the balance should lie between flexibility around working methods and automated approaches within the system. It would be perfectly feasible to design and automate a unified process for score reconciliation, but this would necessarily restrict the flexibility of panels to develop working methods tailored closely to the nature and volume of output submissions received.

6.6.2 Impact

458. The main and sub-panels began the impact assessment process in summer or early autumn of 2021, depending on their main panel level schedules. These scheduled timings had allowed us to add an additional COVID-19 mitigation in January 2021, whereby institutions could request an extension of up to six weeks (14 May 2021) to the submission of the case study narratives. The panels were instructed to ensure no impact assessment processes (including allocation and calibration) commenced prior to the 14 May.
459. Impact assessors were invited to join the sub-panel meetings where impact assessment was discussed. To support the panels' assessment process, we provided guidance on impact eligibility requirements and prepared a presentation that the secretariat could tailor as appropriate to their panel, to brief the sub-panels in advance of the impact assessment commencing. We also provided a 'quick start guide' for the impact panel spreadsheet for sub-panel executives.
460. As with outputs, all main and sub-panels conducted a calibration exercise for impact at the start of the assessment schedule for this element. Again, the

purpose of these exercises was to develop a common understanding of assessment standards and, for impact in particular, allow the sub-panels to raise and resolve issues in relation to determining case study eligibility. The main panels conducted the calibration exercises first, typically drawing on a sample of the calibration cases selected for the sub-panel exercises. Further details about these exercises at sub-panel level are included in the main panel overview reports.

461. The system functionality for case study allocation worked in the same way as for outputs (although without the option of using automated allocation software, in view of the much smaller scale of the items requiring allocation). Allocations were made by the sub-panel executive group, with the system preventing allocation of items to reviewers where a major conflict of interest had been listed on the PMW.
462. One of the ways in which institutions were supported in submitting confidential material in impact case studies was through identifying at the point of submission any panellists who the institution believed would have a conflict of interest in viewing or assessing the specific case study. The guidance set out that the case studies would not be made available to such individuals. To manage this in the assessment systems, case studies with the conflicted panellist field completed were not included on the USBs or on the submission viewer, but were only available to those to whom the item was allocated. This caused some issues during the allocation stage, where sub-panel executives at times required access to the case studies to support the allocation process. The issue was exacerbated by the incorrect use of the field by some institutions in listing panel members employed by the institution rather than those who should not view the case study. We corresponded with these institutions to clarify the requirements, allowing us to make available those case studies that had been incorrectly marked. The funding bodies should consider clarifying the guidance further on the use of this field during the submissions process in a future exercise, as well as exploring a less restrictive approach to the provision of these case studies to better support sub-panel executive processes.
463. Sub-panels assessed case studies in groups comprising both academic panel members and user members or impact assessors. The virtual format worked reasonably well for these small-group style discussions. Progress on impact assessment typically ran to schedule across the panels, although this sometimes included adding in further meetings to those originally scheduled. It proved difficult to identify a suitable deadline for the majority of audit queries to be

raised that would inform the impact sample audit as these tended to arise from panels during the detailed assessment process. Across some main panel areas, this period fell after the timeframe scheduled for the sample audit.

464. Where panellists required access to the corroborating evidence to verify information included in a case study, this was requested via raising an audit query to the panel secretariat. Where the evidence was already held, because it had been included at the point of submission, it was made available via the submissions viewer using an automated approach upon request via the panel spreadsheet. Where it was not already available, the audit team requested this from the HEI before making it available via the submissions viewer.
465. The audit-request based approach to accessing the corroborating evidence was implemented following discussion of the approach with the main and sub-panels during the early 2020 meeting round. This approach was agreed to ensure consistency across the panels in accessing evidence for verification purposes. As set out in paragraph 167, there was feeling across some panels that the evidence should have been automatically available to review as a routine part of assessing the case study. This issue will require further consideration by the funding bodies in a future exercise.

6.6.3 Environment

466. The environment assessment was the final assessment element to commence across all panels, beginning from September 2021. There were differences in the timing of this across the autumn as some panels started alongside assessment of other elements, while others completed each element in turn first (usually reflecting the differences in the nature of the submitted outputs across panels). As with impact, in view of the extension in place until 14 May 2021 for some environment narratives, panels were instructed not to undertake any environment allocation or calibration discussions until after this point. In some instances, the REF5b (unit-level) file was provided, but the REF5a (institutional-level) file for the submitting institution had an extension in place. Because these templates were provided to panels as combined files, it meant that the REF5b was initially not available in these instances.
467. The standard analyses of data that was provided to panels to support the environment assessment was also delayed due to the COVID-19 mitigations in

place. In particular, we needed to hold off the completion of the standard analyses until all of the HESA adjustments, and any corrections submitted to REF4 data during the corrections period, had been submitted and processed.

468. When they were provided, the standard analyses were intended to remain static, without further changes made (for example, in view of any audit updates). However, in response to the ongoing process of reconciling the HESA staff record with submitted data and some material amendments made through the audit process for a small number of HEIs (typically linked to errors in HESA returns), we took the decision in autumn 2021 to provide an updated set of analyses, with changes above a certain threshold flagged within the documents. In future exercises, the funding bodies should consider the advantages and drawbacks of providing a 'live' version of the standard analyses for panels that links directly to the submissions data, to provide analyses that includes any data amendments; however, consideration will need to be given to how any amendments are flagged to panels.
469. As for the other elements, full calibration exercises were held for the environment at both main and sub-panel level. The purpose of these was again to develop a common understanding of assessment standards and, for environment in particular, work through the process for assessing the template in the context of the REF5a institutional statement and the REF4 data. Further details about the exercises are provided in the main panel overview reports.
470. The system functionality for environment allocation worked in the same way as for other elements. Allocations were made by the sub-panel executive group, with the system preventing allocation of items to reviewers where a major conflict of interest had been listed on the PMW. In autumn 2021, we provided to each sub-panel advice from EDAP on the EDI elements of environment submissions. All templates were assessed by groups of sub-panel members, with the number and detailed methods for this varying in relation to the overall workload of the sub-panel.
471. During the early 2020 panel meetings, we had confirmed the detailed approach to scoring that would be adopted for the assessment. Following the approach for REF 2014, all panels recorded the scores agreed collectively for each item according to a common approach. In arriving at agreed scores, as previously, sub-panels could follow an approach whereby individual members used an agreed more granular scale for outputs (usually either a nine or 13-point scale for this

purpose). Final scores for outputs were recorded on the five-point scale, with impact and environment recorded on a nine-point scale – here, half-marks were awarded for case studies or environment sections judged on the borderline between two starred levels. The score contributed to the sub-profile with half of the grade assigned to each of the two starred levels that the grade fell between.

472. Early during the assessment phase, we explored implementing a more granular approach to scoring the environment with the main and sub-panels. This was in response to feedback from members in Main Panel B with 2014 experience, where it was found that recognising small elements of excellence was difficult with the nine-point scale. The more granular approach proposed involved awarding five marks flexibly across the five-star scale for each section. This was intended to allow, for example, recognition of four-star elements within a predominantly two-star section. Discussion across the panels revealed concerns in relation to the timing around introducing a potentially more complex scoring approach, as well as questions around its detailed implementation that it was felt needed exploration with the sector in advance. It was therefore agreed that the original nine-point scale approach would be retained for 2021 across all panels. The funding bodies should seek to explore the feasibility and benefits of the more granular method for a future exercise.

6.6.4 Consistency of assessment standards

473. Throughout the assessment process, the sub-panels regularly reviewed scoring patterns and trends to ensure a process of continuous calibration. Each sub-profile for each submission was collectively agreed by the sub-panel at the end of the assessment process and recommended to the main panel for approval.

474. The structure of the main and sub-panels drew on the precedent of previous exercises to provide effective guidance and oversight, and to ensure consistency in assessment standards. This model continued to be very effective in REF 2021, with the main panels meeting in between each round of sub-panel meetings. While some flexibility in schedules at sub-panel level was introduced in response to COVID-19 pressures, the broadly consistent timetable against which the sub-panels within a main panel conducted the assessment allowed effective review of emerging profiles and resolution of assessment issues arising. A key role for the main panels was to reach an understanding about any significant differences observable across the sub-panel profiles; where these were identified, methods including review of material by additional main panel members, detailed data analysis, and cross-sub-panel moderation took place, which either provided

justification for differences or suggested areas where additional moderation of scores should take place.

475. To further enhance and maintain oversight of the consistent application of assessment standards, we took a more formal approach to cross-main panel working in REF 2021. This included establishing as a formal group (MAP) the chairs of the four main panels, EDAP, IDAP, and ILEPP, the panel advisers and the REF director. This worked well and provided a clear and responsive route for seeking rapid panel input on key issues especially during the development of the COVID-19 mitigations.
476. Calibration exercises were undertaken across all three elements via the MAP group, supplemented with two to three additional members from each main panel. At appropriate points we compared the average profiles emerging within each main panel, for each of the three elements of assessment. The most notable feature from the emerging profiles was the higher quality levels observed for outputs, as was in part anticipated from the changes made to submission of staff and outputs. In response to requests from this group, further analyses and exploration of the scoring trends in contrast with REF 2014 were undertaken, and advice and guidance was given around ensuring effective communication around these issues when publishing the results. Further information about the work of the group is set out in the 'Summary report across the four main panels'.⁶⁶

6.6.5 Workload

477. In the end of exercise survey, we invited views from panellists on the overall workload of the assessment process. Table 4 below summarises responses to this question. The proportion responding 'excessively heavy' (13 per cent) shows some decrease from the 2014 figures (18 per cent); however, differences in survey timing should be taken into account, as the 2014 survey was administered midway through the assessment year. Nearly all of those responding 'excessively heavy' were academic / practising researcher roles. Respondents from Main Panel B were the least likely to report that the work was excessively heavy (4 per cent of Main Panel B respondents), compared with 17 per cent of Main Panel A respondents and 14 per cent of Main Panel C and Main Panel D respondents). None of the advisory panel respondents responded in this way.

⁶⁶ 'Summary report across the four main panels', available at www.ref.ac.uk under 'Publications and reports'.

Table 4: panel survey responses on 'How heavy has the overall workload been?'

Response option	% Respondents (n=471)
Excessively heavy	13%
Heavy but manageable	78%
Not particularly heavy	8%

478. When asked how far the workload matched expectation when joining the panel, the vast majority of respondents to this question stated that the workload was either quite similar or very similar to what they expected when joining the panel (87 per cent). Of those who reported that the workload was either not at all similar or not very similar to their expectation (17 per cent), over two thirds had not served on a REF panel before.

479. Table 5 below summarises the time allowances made by employing institutions for respondents to the survey. Those who responded to indicate 'no allowance' was made were most likely to be research users (24 per cent of research users responded in this way) and those who were most likely to say 'enough to free up the majority of time required' were academic / practicing researchers (24 per cent responded in this way).

Table 5: Panel survey responses on 'To what extent has your employer/institution made allowances for your time spent on REF work?'

Response option	% Respondents (n=471)
Enough to free up the majority of time required	23%
Enough to free up a substantial proportion of the time required	18%
Some allowance made	26%
No allowance made	21%
N/A	13%

480. In advance of the assessment year, concerns were raised by panels about changes to the time relief offered to panellists by institutions – reflecting both the changes made to the assessment schedule and the pressures also being faced by institutions during the pandemic. In response to these concerns, the funding bodies wrote to their institutions to encourage continued support for panellists. In future, the funding bodies should consider whether to require a more formal

commitment to supporting panellists' time from institutions at the nominations stage, in the same way as was required for main and sub-panel chairs.

481. It is clear that the workload involved in being a REF panellist continues to be high, and feedback on meeting format (see section 0) indicate this was made more tiring – and, for some, less enjoyable than previous experience – due to the virtual format of meetings. The successful completion of the exercise reflects the significant dedication to the assessment process and investment by panellists and the secretariat during a very difficult wider context and in circumstances clearly removed from what had been expected.

6.6.6 EDAP and IDAP

482. EDAP had a wider role during the assessment phase in REF 2021, in contrast to REF 2014. In addition to reviewing all staff circumstances reductions (including those arising from 'defined' circumstances) newly applied or amended since the advance review stage, EDAP also reviewed a sample of environment statements across the sub-panels to provide advice on the strength and limitations observed in relation to the EDI aspects covered. Also, alongside again reviewing submitted EIAs, EDAP also reviewed the staff circumstances reports provided by institutions in July 2021, which provided data and reflections on the reductions processes in place. EDAP's findings and recommendations in relation to these activities are described in the panel's final report⁶⁷.

483. We provided the outcomes from EDAP's review of the staff circumstances reductions to the main and sub-panels as a summary report when the review process had completed. These were then provided as meeting papers to the main panels for agreement and to the sub-panels for noting. Sub-panels did not have access to any further data or information about the reductions applied. This was intended to recognise the extremely sensitive, personal nature of some of the data included in REF6, which therefore needed to be shared on as minimal a basis as possible.

484. The environment advice was similarly provided as a summary report, and shared with the main and sub-panels as meeting papers. The main panel chairs also received regular updates on process and emerging outcomes from the EDAP chair at the MAP group meetings. However, towards the end of the process, some sub-panels felt a bit disconnected from the work of EDAP and would have

⁶⁷ The final EDAP report is available at www.ref.ac.uk, under 'Publications and reports'.

valued further opportunities for discussion and exchange. In contrast to 2014, we did not include any cross-membership between EDAP and the sub-panels.

However, in a future exercise, the funding bodies should review the approach to engagement between EDAP and the sub-panels – potentially exploring a network model, as we had in place for IDR.

485. IDAP was a new panel for REF 2021, whose role during the assessment phase was to provide advice on the consistent application of processes supporting IDR assessment and review the overall effectiveness of the IDR measures in place for REF 2021. IDAP's reflections on the operation of the IDR measures in place, along with further details of the panel's role and working methods, is set out in the final IDAP report⁶⁸. See also section 0.

486. The membership of IDAP included the main panel IDR leads during this phase, which provided a valuable link between the work of the main and sub-panels, and the advisory role played by IDAP. The main panel leads also convened 'hubs' for the sub-panel IDR advisers within that main panel, to explore any issues arising in relation to IDR.

487. The IDR advisers on the sub-panels were also members (with IDAP and the main panel leads) of the IDR network, which was intended to be a member-led forum for these roles to engage across the main panel groups to share good practice, identify shared issues and support consistency of approach. As captured in the IDAP report, the virtual format did not lend itself well on the whole to achieving these aims, with mixed views expressed about the value of the meetings. In view of this feedback, and as the main stage of output assessment had largely completed by the late autumn of 2021, the last scheduled meeting of the network did not go ahead.

488. The organisation and management of the IDR network was resourced from within the existing capacity of the REF team, as was the committee servicing for IDAP. This is likely to have limited the extent to which network activity could be driven forward pro-actively and better adapted to the virtual format, particularly during some of the resource-intensive periods for the REF team in 2021. In a future exercise, consideration should be given to resourcing the management of the network to dedicated resource, or alternatively as part of the IDAP secretariat where this is on a secondee basis.

⁶⁸ The final IDAP report is available at www.ref.ac.uk, under 'Publications and reports'.

6.7 Administrative support

Key points

- A new approach to panel fee payments was agreed for REF 2021, including a flat-rate fee and an overall increased fee rate.
- The overall proportion of expense claims saw around a 30 per cent reduction to the number processed in 2014, reflecting the reduced travel and expenses incurred during the virtual meeting process.
- Key challenges were experienced in planning hybrid meetings during the assessment year due to the necessary responsive nature of decision-making on format; meeting location, venue and accommodation details could only be confirmed at a late stage.
- There was general positivity expressed about the venues and accommodation used across the phases of the exercise.
- Panel hosts were introduced to support fully virtual meetings; recruitment to these roles was difficult and time consuming to fulfil.
- Admin support was provided primarily through a dedicated inbox; wide satisfaction was expressed with the helpfulness of the admin team by panellists.

Recommendations

- For any future virtual meetings, consider covering the functions performed by panel hosts through additional secretariat resource.
- Consider introducing a ticketing system from the early stages of the next exercise to better support the management of admin queries.
- Review the admin functionality of the PMW to provide:
 - bulk import of meeting details
 - permissions to enable administrators to carry out any required amendments to payment dates or fee totals
 - functionality for members to access a downloadable version of the remittance advice
 - functionality to approve part of an expense claim rather than placing the whole claim on hold where there are outstanding queries
 - a visible record of expense payments for members to view/download
 - permissions to enable administrators to upload documents to the Guidance page of the panel members' website.

6.7.1 Fees and expenses

489. Sub-panel members and assessors were eligible to claim a fee for their role in REF, with the exception of those who were civil servants or employees of organisations wholly or predominantly funded by government. We adopted a new approach to panel fee payments for the REF 2021 exercise, that provided a flat-rate fee per stage of the exercise in place of a meeting attendance and preparation fee paid in previous exercises. The flat rate differed by panel role and

by phase, in recognition of the different requirements pertaining to each. The fees were paid on a monthly basis, calculated according to the total flat rate for the panel role in the relevant phase. The flat rate fee was intended to cover:

- attendance at REF panel meetings
- preparation for REF panel meetings,
- for panel Chairs, additional advisory and ambassadorial activity on behalf of, and as agreed with, the REF team.

490. The overall fee rate was increased from the 2014 exercise, to better reflect the work required. For the assessment phase, the flat rate fee for main and sub-panel members was £6,000 (split across FYs 2020-21 and 2021-22), £3,600 for assessors, £10,000 for sub-panel chairs and £12,000 for main panel chairs. Specialist advisers continued to be paid fees on a sliding scale relating to the volume of work undertaken. The new fee approach sought to respond to feedback from members in 2014 that panel fees were generally low (although not prohibitive), and the previous REF manager's recommendation that fees are reviewed.

491. When surveyed at the end of the exercise, 56 per cent of respondents felt the fees were low but not a barrier to participation, with 29 per cent responding that the fee levels were adequate. The remainder felt the fees were low and a potential barrier to future participation (10 per cent) or they were ineligible for fees (5 per cent). In contrast to the previous exercise, there were no notable differences for impact assessors in the proportion who felt the fees were low and a potential barrier to participation.

492. In March 2020, following the postponement of the exercise due to COVID-19, the REF Steering Group agreed to pause fee payments to panel members for the duration of the delay. In view of the anticipated engagement in mitigations and preparation work during 2020, a retainer was instead paid through this period. Fee payments did not pause for EDAP or for the main panel chairs, whose functions continued throughout the delay period. Fee payments recommenced on the restart of the exercise in July 2020, and were extended for a four month period in FY 2022-23 in recognition of the pause period.

493. During the REF exercise, fee payments were subject to process revisions with members appointed during the criteria phase initially paid via UKRI payroll. As we needed to pay members ahead of completing the transition from HEFCE to RE, the payment process was developed in liaison with future UKRI finance

colleagues and paid via the Engineering and Physical Sciences Research Council (EPSRC) operating unit. To enable the creation of the skinny HR records, panel members were required to complete an HMRC new starter form as well as providing payment information. The REF admin team had to check the details provided and chase any missing information before submitting this to UKRI's shared business services (UK SBS) for processing.

494. Once members were set up, the fee submission process was straightforward. P60s were sent by UK SBS at the end of the tax year. Members were able to donate their fee to their institution or another charity using 'Give as you Earn' via payroll; this was arranged via the Charities Aid Foundation.
495. Due to changes in HMRC legislation, we were unable to continue paying members via payroll from FY 2020-2021. Members were classified as non-part-time office holders at this point and payments had to be made directly to members, with no deductions made at source. From the commencement date of this change, members could no longer donate their fees via 'Give as you Earn', but they could ask for their fees to be paid to their employer via invoice. As P60s were no longer provided, the REF admin team would draft a fee statement for members on request, detailing the monthly payments and clearance dates.
496. The fee submission process from FY 2020-2021 was much more time consuming, requiring more extensive data than the payroll spreadsheets, and more manual checks and edits ahead of approvals and processing. Additionally, on occasions where payments were rejected by UK SBS, the Senior REF Administration Manager had to investigate the issues to enable resubmission.
497. Where fee payment via invoice was requested, this was made on a quarterly basis (direct payment was monthly), which was put in place to reduce some of the additional administrative burden on members' institutions and the admin team. A proportion of invoices had to be chased on a regular basis as submission dates provided in the invoice schedules were often missed.
498. From the launch of the PMW in 2018, panel members were required to submit their travel and expenses claims online, including uploading receipts or other evidence of spend incurred. The admin team checked and approved the expenses in line with the expenses guidance in place, which were then collated and provided securely via the PMW to the UKRI finance team for processing. Panel members had a 90-day limit for expenses submission on the PMW;

occasionally, members contacted the admin team after this limit had elapsed to check whether they could still submit a claim. Late submission was minimal and typically approved providing receipts were included. Across the criteria and assessment phase meetings, the admin team processed over 5,700 expense claims. This is around a 30 per cent reduction in the number processed in 2014, reflecting the reduced travel and expenses incurred during the virtual meeting process.

499. In general, panellists expressed satisfaction with the process for claiming and receiving fees and expenses, with 87 per cent rating this as good or very good in the panel members' survey. A small number of comments received suggested some found the process of uploading receipts for each claim burdensome (in contrast with an audit-based approach used in previous exercises), or noted some delays with payment. However, a quick turnaround time for paying expenses was positively noted by the secretariat in the final feedback meeting.

500. The approval process for fees and expenses was similar, which was via email to REF Director and Head of REF Policy, who were given the opportunity to query anything ahead of approving this for finance to process.

6.7.2 Meeting scheduling and organisation

501. Ahead of the criteria phase, the REF admin team carried out site visits to various venues in London, Manchester, and Birmingham. This intelligence was useful when arranging venues throughout all phases of the exercise and when guiding the venue booking company's search criteria. Some of the venues visited had additional sites in other parts of the UK, so the team was able to discuss the portfolio of venues and assess suitability for our meeting and accessibility requirements where this was the case.

502. Once panels were appointed and accessibility requirements submitted to us, the Senior REF admin manager discussed any practical requirements with the panel members and worked with the venues to ensure that requirements were met. Venues were booked via UKRI's contracted booking company in the main, which provided better value for money as they were able to obtain lower negotiated rates with providers.

Fully virtual meetings

503. In response to the COVID-19 pandemic, the admin team had to quickly adapt processes to enable the required meetings to take place fully virtually. The admin team supported the revision of the assessment phase meeting schedule in liaison with the panel executives. Regular review of the meeting schedules continued throughout the assessment phase as panels requested additional/shorter fully virtual meetings.
504. An individual Zoom account was set up for each main and sub-panel. The login details for each account were managed by the admin team, and were initially shared with panel hosts during the fully virtual phase and then with the secretariat once hosting was scaled back and hybrid meetings commenced. Login details were shared via webmail for security. Advisory panel meetings were set up using REF team Zoom accounts.

Hybrid assessment phase meetings

505. From October 2021, sub-panels in Main Panel C received steering group approval to commence hybrid meetings for their panels. The decision gave the admin team approximately four weeks to arrange venues and hotels. This was a much tighter timeframe to work within than we had planned, and staff shortages in the admin team at this time caused additional pressures in delivery timings.
506. For hybrid meetings, panels were provided with a main meeting room and one or two additional breakout rooms (depending on panel size). Some small group discussions also took place in open breakout spaces at meeting venues where spaces existed. Each main meeting room included a laptop for hosting the Zoom meeting which connected to a large screen, audio equipment and a camera to ensure virtual members were fully integrated into the meeting.
507. Due to the necessary late stage of decision-making in relation to hybrid meetings, meeting location, venue and accommodation details could only be confirmed at a late stage. This caused some frustration for panel members, although we aimed to keep communications and updates as open and frequent as possible during this period. Challenges and resolutions from the hybrid meeting phase included:
- Venues were secured at short notice, there were instances where multiple rounds of enquiries needed be sent by the booking company for any suitable venues be returned. Three-day meetings where no venues had availability on the second day were a frequent issue, meaning we needed to look into options to split meetings across different venues on different days

as well as expanding the geographical area to fulfil our requirement effectively. Whilst this took a considerable amount of resource, ultimately, we were able to keep all panels at the same venue for each of their meeting dates.

- The Senior REF Administration Manager communicated regularly with the panel executives to keep them apprised on venue and hotel progress, this communication was essential for relationship and expectation management given the very tight timelines for delivery.
- A closely managed relationship with a designated contact at the booking company was essential to delivering venues within the compressed timeframe, within budget and to the standard required.
- Once a meeting venue was confirmed, panel members were able to request accommodation via the PMW. The admin team made the bookings using UKRI's travel booking system, which gave us the most flexible cancellation terms possible. Around 650 bookings were made in the period from October 2021.
- Where possible, members were booked into the same hotel, or if room availability was limited, members were booked into hotels of a comparable standard within a short walking distance from each other. We aimed to keep the panel executives from any particular sub-panel together where this was the case and updated the panel executives on any other hotels used across their membership.
- We used the venue booking company to block book a percentage the required accommodation from February 2022, supplementing this with individual bookings if required. As in-person attendance numbers varied depending on individuals' comfort levels on meeting face-to-face, this mitigated some of the risk of overbooking rooms that were subject to cancellation fees.
- As part of the meeting confirmation process, the admin team shared useful information with the panels via webmail. This included any COVID-19 mitigation guidance from venues, suggested COVID-19 guidance on attending REF meetings, venue and car parking information.
- In addition to this the team included a PDF hotel confirmation document with each hotel booking they confirmed via the PMW. This was a continuation of the process we used throughout the exercise and whilst it was an additional task for the team to complete and in many ways a nice to have, we continued including it in view of its value to the panels. The document included, individual booking information, car parking and walking directions from the train station to the hotel.

508. Feedback from panellists in the end of exercise survey indicated general positivity with the venues and accommodation used across the phases of the exercise, with 88 per cent rating the standard of each of these as very good or quite good. Comments mostly reflected panellists' limited experience of using venues and accommodation, with some issues raised around the late notice when details were received during the assessment phase (although usually with recognition of the challenging circumstances). A small number of comments were made on the need for more breakout spaces to be provided.

Panel Hosting

509. To increase support to the panels during the assessment phase, panel hosts were introduced for fully virtual meetings. The host duties included:

- Managing the waiting room and conflicts of interest
- Assisting with polls and breakout group administration (pre-assignment of groups and setting up polls in advance was carried out by the panel administrators)
- Assisting with technical support where they were able to do so, or referring any issues on to the REF admin and/or user support team

510. Due to the ad-hoc nature of these roles, recruitment was difficult to fulfil and very time consuming. For the initial round of meetings, commencing in April 2021, we attempted to recruit nine panel hosts, offering the roles as secondment opportunities. Application rates were low and as a result, the initial panel meetings were covered primarily by members of the REF team. The burden fell particularly on the REF admin team, and due to the volume of meetings, this added considerable pressure on the team when trying to resource this and other tasks required. As this approach was not sustainable, we received support from RE colleagues for the next phase of meetings.

511. Panel Hosts were recruited via agency in the summer of 2021, to support with hosting meetings in September 2021. This was a very administratively intensive process, the newly appointed REF Administration Manager needing to keep pressure on the agency to deliver the number of candidates by the required start date. Several host training sessions had to be delivered as the agency were not able to fulfil the requirement in one tranche and some initial appointments dropped. Some meeting gaps still needed to be covered by the REF team as and when required, which included occasions where temp staff did not attend a meeting with little or no notice. The secretariat reported very varied experiences

of how helpful the temporary appointments were. To manage the impact of the hosting resource on the admin team, additional support with business-as-usual tasks was provided by a member of the RE admin team from August 2021- November 2021: this assistance was agreed whilst two vacancies in the REF admin team were backfilled.

512. As we progressed through the assessment phase, and secretaries were becoming well-experienced in managing virtual meetings, we sought to appoint hosts on a request-only basis, rather than routinely. An additional team member was recruited to assist with hosting and additional administrative tasks. Should additional support for virtual or hybrid meetings be required in future, the funding bodies should consider covering this by recruiting additional secretariat resource, incorporating the host role into an additional panel secretary type support role.

6.7.3 Administrative queries and support

513. A shared mailbox was setup at the beginning of the exercise to manage administrative queries. The volume of queries received varied throughout the exercise, with peaks most notably during panel meeting rounds. The inbox was managed using a flagging and categorising system; however, this became increasingly harder to manage during peaks of increased resource pressures on the admin team. A ticketing system would be preferable for any future team, and the funding bodies should consider introducing this from the early stages of the next exercise.

514. The PMW was used throughout the exercise to support members with their administrative requirements, which was positively reviewed by panellists at the end of the exercise. When surveyed, over 80 per cent felt the PMW was very good or quite good for meeting arrangements and a similar proportion felt it was very good or quite good for admin tasks such as expenses and hotel bookings.

515. Panel meeting schedules were available for members to view via the panel members website and were frequently updated during the assessment phase as additional shorter meetings were added by the sub-panels. The admin team were not able to upload the updated documents to the guidance page, this task needed to be routed via the development team. In a future system, administrators should be able to carry out the upload of updated guidance documents.

516. Meetings on the PMW had to be scheduled individually by the admin team for each panel using a panel admin tool. This was a resource intensive process. It would be preferable to import the meeting details in bulk into the PMW, with editing functionality thereafter.
517. A good proportion of queries handled by the admin team related to members' requests or queries around fees and expenses, which could be reduced in future through system developments to the PMW. This includes for fee remittance advice to members, as manual processes were required to provide downloaded copies to members, and any updates to fee schedules needed to be routed via the development team. In a future system, administrators should be able to carry out any required amendments to payment dates or fee totals, and members should be able to access a downloadable version of the remittance advice.
518. For expenses, claims were sometimes held up where the team needed to query one element of it; in future, the system should provide functionality to approve part of a claim rather than placing the whole claim on hold. Additionally, queries were received in relation to submitted claims, as these were no longer be visible to members once approved by the admin team for payment. A future system should include a visible record of expense payments for members to view/download.
519. In the end of exercise survey, wide satisfaction was expressed with the helpfulness of the admin team, with 94 per cent of respondents reporting that responses to admin queries had been quite or very helpful. In the open comments, a small number of respondents flagged issues with delays in receiving responses to queries, with some indicating this was more noticeable during the later period when the admin team were under greater pressure.



7. Data verification and adjustments

Key points

- The aim of the REF audit and data verification process was to give assurance that the data submitted by institutions were accurate and reliable. Overall, the audit procedures were proportionate and provided the panels with confidence in the accuracy of the information they were assessing.
- Nearly 3,000 audit queries were raised in total, during the assessment year across both central audit team and panel-instigated queries. In comparison to REF 2014, some reduction seen in the volume of impact queries.
- The random sample audits typically revealed a very high level of compliance with the criteria; the highest number of data adjustments was for outputs also submitted in REF 2014.
- Outputs received the highest volume of panel-instigated queries, with 47 per cent relating to an author's contribution to an output.
- One of the COVID-19 mitigations included a six-week period after the submission deadline to provide amendments to the REF copy of the HESA staff return; we received requests for over 3,700 changes from 66 institutions.
- Delivery of audit systems was delayed as a result of the wider delays affecting delivery of the assessment systems. This put the audit processes significantly behind during the assessment year, extending the timetable over a longer period than initially planned.

Recommendations

- Consider reflecting differences in the nature of audit queries – across the sample-based and panel-instigated – more formally within the structure of the audit team.
- Work with the panels closely on the guidance on author contribution in a future exercise to identify whether the requirement for a substantial research contribution can be defined more tightly.
- Ensure there is sufficient temporary resource available to support the sample audit processes.

7.1 Aim and guidance

520. The aim of the REF audit and data verification process was to give assurance that the data submitted by institutions were accurate and reliable. This aimed to ensure that panels could make their assessments based on robust data, and therefore uphold confidence in the outcomes. Institutions were therefore expected to be able to provide verification of all information submitted. Overview information about this was set out in the 'Guidance on submissions', with the

terms and conditions for submitting asking institutions to confirm that submission information was correct, complete and not misleading.

521. In view of the substantial changes made to the approach to submitting staff and outputs in REF 2021, we sought to provide more detailed, earlier guidance on audit procedures to institutions than had been the case in previous exercises. This required the earlier appointment of an audit manager at a more senior level, who could begin early work on the detailed procedures. Given legislative changes around personal data since the previous exercise, we sought to combine the audit role with oversight of information management for the exercise, and in 2018 we appointed the Head of REF Data Verification and Information Management. The 'Audit guidance' (REF 2019/04)⁶⁹ was developed following completion of the final guidance and criteria. It described the approaches and methods that would be used in the data verification process and was published in mid-2019. Each HEI designated an audit contact that was responsible for receiving and responding to all audit queries from the REF audit team.
522. In the event of an audit query, an institution was requested to provide evidence and/or further information to address the issue raised. Depending on the nature of the query, the audit response was either passed on to the relevant REF panel for consideration or reviewed by the REF team (in which case the REF director took decisions regarding data adjustments). In some particularly complex or significant instances, the REF Steering Group was invited to take review decisions on adjustments, including in relation to outputs submitted in 2014 and staff eligibility.
523. There were different types of outcome for audit queries, depending on whether the issue required panel judgement, with potential impact on the grading of submissions. Where it did, typically the information was returned to the panel and incorporated in their assessment process. Where it did not – for example, in cases related to staff eligibility or REF4 adjustments – any required data adjustments were approved by the REF director, with data added, removed or replacing missing or inaccurate data where it was identified.
524. In terms of skill-sets required for these different tasks within the audit team, the tasks involved in the majority of the sample audits required staff focused more on analytical work, while the panel-instigated audits tended to require staff with a

⁶⁹ 'Audit guidance' (2019/04), available at www.ref.ac.uk under 'Publications and reports'.

background in REF policy and communications. In a future exercise, it may be worth reflecting these differences in the nature of audit queries within the structure of the team more formally.

7.2 Pre-submission cross-check on staff mapping

525. One of the concerns regarding all-staff submission raised through our early consultation activity for REF 2021 was the potential for staff to be inappropriately mapped to a UOA to maximise a submission in another UOA. Decisions on where to map staff remained with institutions, within the broad guidance that the research carried out in a submitted unit must relate primarily to the areas of research set out in the descriptor of the UOA in which it is submitted. To respond to these concerns, and underwrite the integrity of the exercise, the 'Guidance on submissions' outlined that cross-checking would be undertaken between submitted staff UOA and HESA cost centre, to identify and explore any significant anomalies – albeit recognising that cost centre allocation is undertaken for differing purposes to REF and making clear it was not intended that routine justification would be required.
526. We aimed to do an initial check on mapping using the 2018/19 HESA staff record and the data returned in the survey of submission intentions. The new REF fields in the HESA staff record had been added as optional fields in this return to help identify any issues with their use at an early stage. In consequence, the data returned were very patchy and in some cases the timing of the return was not well aligned with the implementation of institutions' approved processes for identifying staff with significant responsibility for research. In early 2020, we corresponded with around a third of submitting HEIs where we had identified a significant variance between the FTE of staff returned in the survey, and the FTE of staff identified with significant responsibility in the HESA return, to seek to understand why this was. In the majority of cases, these differences resulted from the timing of the return taking place before processes around significant responsibility were finalised. Data had therefore not been returned in full or in part.

7.3 Submissions corrections and HESA adjustments

527. As part of the January 2021 mitigations introduced due to COVID-19, there was a six-week period following the submission deadline in which institutions could provide corrections to errors identified in the submitted data. Corrections could only be submitted for certain fields, which were documented in the guidance provided to HEIs. We used the audit ticketing system to manage the corrections process, with details on required corrections submitted in an excel template via this portal. 65 institutions submitted a total of 2,252 corrections – although not all of these were for data fields where corrections were permitted.
528. In REF 2021, the corrections period was responsive to the wider context; however, it was challenging to manage using spreadsheets, which often suffered from formatting and/or versioning issues. Should any such process be required in future, it would be preferable to use the submission software directly, with the functionality to switch on/off updatable fields and add enhanced validation to ensure changes are made within the bounds of the guidance.
529. During this six-week period also, we accepted amendments to our copy of the HESA staff return for 2019/20 for the UOA and ECR fields. Any errors in the identification of Category A eligible staff derived from HESA could also be flagged. The adjustment period aimed to recognise that the increased time between the deadline for submitting the HESA staff return (in November 2020) and the delayed REF submission deadline (in March 2021) may have led to differences between the datasets. Therefore, the amendments sought to improve the accuracy of data provided to the panels in the standard analyses (that drew on the HESA staff return) and to reduce the risk of discrepancies identified during the audit period.
530. A total of 66 institutions requested amendments to our copy of the HESA staff record for the UOA and ECR fields, with over 3,700 changes sought in total. Nearly 60 per cent of the changes were for the UOA field. The adjustments were also managed through the audit ticketing system, using excel templates that provided a copy of the HESA data we held to the requesting institution. As with the corrections process, this involved a lot of manual processing and, if time had allowed, would have benefitted from more integration within the audit software.

7.4 Audit systems

531. Two primary systems were used to manage the data verification process:
- A ticketing system to manage correspondence between the REF audit team and institutions on the one hand, and the panel secretariat on the other. This system was integrated with both the assessment system, by which route initial audit queries were submitted by panels and final outcomes reported back to them; and with the panel communications system, to facilitate any communications needed on the query with the secretariat.
 - A submissions editor, that allowed the REF audit team to make any necessary data adjustments in the submission system.
532. When fully operational, these systems for raising queries and making data adjustments worked well. Detailed design recommendations to improve this further in a future exercise have been captured from the audit team. However, as a result of the wider delays affecting delivery of the assessment systems (see section 0), integration of the ticketing system and provision of the submissions editor was delayed until two months after significant audit work had begun, requiring time-consuming manual work-arounds by the audit team. This put the audit processes significantly behind, and additional resource was required to undertake catch-up work through the remainder of the assessment period.
533. Due to the way the data were held in the ticketing system, our analysis is primarily limited to reporting on the number of queries raised and resulting data adjustments. Queries sometimes included multiple records (for example, of staff or outputs).

7.5 Sampling and data comparison

7.5.1 Staff audit

534. The purpose of the staff audit was to verify that institutions had submitted all eligible staff with significant responsibility for research, and that all submitted staff were eligible. A sample of 2,897 staff from across all submitting institutions was selected, from between one and four UOAs and up to a maximum of 40 staff per institution. Where applicable to the staff included in the sample, the audit requested evidence of:
- The eligibility and FTE of Category A submitted staff.
 - The eligibility and FTE for the declared employment periods for former staff.
 - Evidence of cited circumstances (in lieu of providing a substantive connection statement) for staff where FTE is between 0.20 and 0.29.

- Evidence that staff do not have significant responsibility for research, in line with the code of practice processes, for Category A eligible staff not included in the submission.
535. The random sample revealed a very high level of compliance with the criteria, with just one query resulting in a data adjustment. Following advice from 2014, we sought to provide more guidance to institutions on the types of evidence that would be accepted, while underlining that such guidance was not exhaustive. We therefore continued to be flexible in accepting a range of evidence types. In general, the evidence base for the staff sample was robust; however, in some instances some of the eligibility information was only held in spreadsheet format (despite our guidance on the unsuitability of this). While we took a proportionate approach to evaluating this evidence, typically drawing on the 'last-edited-date' of the file, more consideration in advance of how to approach this issue could be given in future.
536. The staff sample audit involved significant effort over an extended period to complete, drawing on additional temporary resource. The organisational transition from HEFCE to Research England limited the extent to which we were able to draw on internal staff with existing knowledge, adding in the need for training and closer oversight.
537. We also undertook a data comparison between our copy of the HESA staff return for 2019/20 and submitted staff. Audit queries were raised for the following discrepancies: where staff recorded with significant responsibility for research in the HESA staff record were not included in submissions; where staff included in submissions could not be matched with an eligible staff record in HESA; where the UOA of submitted staff differed from that recorded in HESA. The audit team raised 122 queries (each in relation to multiple staff records) in relation to these identified discrepancies, across 92 institutions. This resulted in ten data adjustments; however, in several instances, the queries uncovered issues in the original coding of the HESA return.
538. Staff data contained within REF submissions was also compared across institutions to identify any individuals who had been returned by different HEIs with a total FTE of greater than 1.0. A total of 31 institutions were contacted in relation to one or more staff where this issue had been identified; 23 of these queries resulted in data adjustments. This issue had involved several complex cases in REF 2014, often related to staff serving a notice period. For 2021,

therefore, we sought to provide more explicit guidance on this point at the outset, confirming that where staff are serving notice at another institution at the census date, they are not eligible for return by a new employing institution. While one of audited cases was referred to the REF Steering Group for review, the clarity of the guidance in place for this exercise supported the decision-making process and helped to ensure a consistent approach was maintained across all institutions.

7.5.2 Output audit

Open access

539. Our 'Audit guidance' set out a detailed approach to the audit of open access for outputs, in recognition that the policy was new for 2021 and there was a lot of interest and concern in the sector around how the data would be verified.
540. We operated the process as described in the guidance, with stage one involving a risk assessment to inform the selection of HEIs and submissions for possible audit review. The risk assessment was based on counts of the following:
- The number of 'other' exceptions used
 - The count of in-scope outputs marked as is_oa in Unpaywall⁷⁰
 - The count of in-scope outputs where there is an entry for url_for_pdf in Unpaywall
 - The count of in-scope outputs where the number of days between datePublished and depositedDate in CORE⁷¹ is greater than 92.
541. A scale factor was then applied to invert the counts for categories [2] and [3] and to ensure that the highest score in each category was the same number. Institutions were then selected for the next stage of the process based on the highest scores in each individual category, and the highest scores overall.
542. Ten institutions were selected for the second stage of the audit process, in which their open access policies were reviewed to assess whether they were managing compliance with the REF 2021 open access policy effectively. Of these, three were selected for substantive sampling, and the sample size was proportional to the size of the institution (the smallest sample was three, the largest was eight).

⁷⁰ See <http://unpaywall.org/data-format> for details of the data definitions.

⁷¹ See <https://core.ac.uk/documentation/dataset#dataset2020> for details of the data definitions.

543. In addition, one HEI had returned more than 5 per cent of their in-scope outputs as non-compliant with the open-access policy, and we contacted them so that they could select which output would be removed as ineligible.

544. As a result of the open access audit, four queries resulted in data adjustments.

Outputs sample and comparison

545. Two sample audits were undertaken for outputs published early or late in the REF period: verification of date the outputs of current staff became publicly available; verification of date first publicly available for former staff outputs, as well as verification the staff member was employed as Category A eligible on that date. Priority in the sample was given to outputs without a year match in Unpaywall or Jisc Core. We sampled two per cent of outputs with a submitted publication year of 2014, 2020 or 2021, totalling over 900 outputs across the current and former staff groups.

546. For current staff outputs, audit queries were raised with 127 institutions. Ten queries resulted in data adjustments, although this did not always mean items were found to be ineligible. In some cases, an adjustment provided a correction to an error in submitted data. For former staff outputs, queries were raised with 108 institutions. Four queries resulted in data adjustments.

547. As stated in the 'Audit guidance', we compared the digital object identifiers (DOIs) of outputs submitted to REF 2021 with those of outputs that were submitted to REF 2014, using the publicly available list of outputs from the previous exercise. This identified 80 outputs across 40 institutions that had been submitted in both exercises, all of which were deemed ineligible following audit investigation and removed from submissions. As set out in paragraph 163, it was clear that some institutions had experienced challenges in identifying these outputs during their preparation of submissions, and some of these asked for a review of the audit decision. The REF Steering Group considered that the guidance on this point was sufficiently clear and agreed the audit decision should be applied as set out, to ensure all submitting institutions were assessed transparently and on an equal basis.

548. In addition to the above audit processes, the REF audit team raised 57 queries with institutions in relation to corrupted or missing output PDFs. Some of these arose from the PDF retrieval issues we encountered, as described in paragraph 257.

7.5.3 Impact and environment sample

Impact

549. Following the approach adopted in REF 2014, we supplemented panel-instigated audit with a random sample audit of impact case studies to ensure a sufficient spread across institutions (around 5 per cent of submitted case studies per institution). If an institution had already been audited on 5 or more per cent of case studies, they were not included in the sample. This resulted in a sample audit of 213 case studies across 111 institutions.
550. The sample audit sought evidence in relation to eligibility of the underpinning research and, where not already provided, the corroborating evidence for the impact claims. Where a COVID-19 statement had been provided, verification of the information provided was also requested.
551. The audit revealed a high level of compliance with the guidance, with only four instances where the information remained unverified or corrections were identified. In these cases, the information was passed onto the relevant sub-panel to take into account in the assessment process.

Environment

552. We followed a similar approach to the impact sample for identifying the sample for the random audit of unit-level environment templates. This aimed to ensure at least one unit-level template was audited for each submitting institution, supplementing panel-instigated audit, and resulted in 146 queries raised on templates across the same number of institutions. This also revealed a high level of data accuracy in statements, with unverified information passed to sub-panels in only six instances.
553. The sample audit of environment templates presented a number of challenges for the team, however. The relatively low number of panel-instigated audits on environment templates meant that a high number needed to be included in the random sample. We had indicated in the 'Audit guidance' that we would seek to verify key claims in the audited statements. Unlike with the impact case studies, however, the length of the statements made infeasible a general request for evidence to verify key claims. This would have placed significant burden on institutions in providing evidence, as well as on the audit team in reviewing it. We therefore identified a specific key claim in a randomly selected section of the template for each one being audited.

554. As far as possible, claims for verification included quantitative or other evidence-based statements, for which specific evidence could be provided. This was a resource-intensive task, which required support from the REF policy team to complete. While overall the sample audit provided clear reassurance as to the veracity of claims, the funding bodies should consider whether an alternative approach may be more proportionate. For example, if more use is made of standardised metrics, whether audit activity could routinely focus on verification of these data.

7.5.4 Environment data (REF4) audit

555. Submitted environment data had already been validated by the REF submissions system, which imposed limits based on each HEI's returns to HESA, or data provided by the research councils and health research funding bodies for income-in-kind (REF4c), for the years 2013/14 to 2018/19. A pre-submission adjustment process had already been undertaken to amend validation limits for REF4c data, as described in section 0.

556. During the audit period, targeted audits of environment data were carried out, where either:

- REF4 data were submitted close to the submission system limits, indicating that potentially ineligible data may have been returned to the REF.
- A comparison of REF and HESA data at subject level indicated a potential discrepancy in the way the HEI had allocated data to REF UOAs.

557. As a result of these comparisons, across REF4a/b/c we sent 24 queries to 23 institutions. HEIs were requested to provide further information or evidence to verify that any REF data that significantly exceeded HESA or the funders income-in-kind data (including in particular years) were eligible, or to explain how the data had been allocated to UOAs. Where discrepancies could not be verified, the ineligible data was removed or replaced. As a result of this audit, eight data adjustments were made to REF submissions. Five of these related to doctoral degrees awarded (REF4a).

7.6 Staff circumstances

558. During the assessment year, the REF audit team raised queries with institutions, typically where any concerns had been raised by EDAP. These related both to cases reviewed in advance (that were also then applied at the submission

deadline), as well as any newly applied cases. This process sought to verify the submitted circumstances. Where the information included special category personal data, the audit only required evidence of the staff self-declaration.

559. For the minimum of one reductions (REF6a), 49 cases were flagged for audit: 19 of these were flagged during the advance process in 2020, the remainder were flagged following the submission deadline. All of these queries related to whether an eligible output existed. Following review of audit evidence, 9 data adjustments were made due to the identification of an eligible output.
560. Two audit requests were raised for REF6b unit rationale statements. No subsequent data adjustments were made.
561. For REF6b underpinning circumstances, 226 audit requests were raised. 224 of these were a random sample of tariff cases (Secondment/ECR). Six data adjustments were made in consequence (not all of these were adjusted to 0, with some reduced in part, for example, from 1.5 to 1).

7.7 Panel-instigated audit

562. In addition to the REF sample audits and data comparisons, REF sub-panels could raise queries to verify any aspect of a submission that they had concerns about, to seek further information where it was required to make particular judgments, or to query missing or incorrect data. There were three main categories of panel-instigated audits: outputs, impact and environment. A summary of the number of queries and data adjustments made in relation to each aspect is set out in Table 6.
563. Due to the changes made to the submission of staff, including staff circumstances, in REF 2021, we did not provide a panel spreadsheet on staff via the PMW, as had been done in previous exercises. While this in general was aligned with the principles of the more unit-focused approach of 2021, it caused a minor issue where panels wished to raise audit queries in relation to individual staff. This instead needed to be done via the outputs spreadsheet or, in a small number of cases (typically relating to queries about groups of staff), via the environment spreadsheet.

Table 6. Summary of audit queries and data adjustments

	No. of audit queries	No. of data adjustments
Outputs	1,040	270
Impact	172	65
Environment	21	4

564. Only a small proportion of staff queries were raised overall and these were predominantly in relation to the substantive connection of staff on fractional contracts. In total, 20 queries on this issue were raised, with 13 data adjustments made. See paragraph 160 for more information on this issue. A small number of staff queries were raised in relation to being an independent researcher, with no data adjustments made in consequence.
565. Outputs received the highest volume of queries overall. The most commonly raised query in relation to outputs was on an author's contribution to an output, totalling approximately 47 per cent of output queries. These queries were raised where the sub-panel had doubts about the author's contribution, including where the provided statements did not align with the information available in the output itself. The outcomes of these audits were considered by panels and were used to inform their judgements about whether the criteria for author contribution had been met. In many cases, a second request was required where the sub-panel had outstanding queries or concerns about the information provided. The funding bodies should seek to work with the panels closely on the guidance on author contribution in a future exercise to identify whether the requirement for substantial research contribution can be defined more tightly. It may be helpful to explore whether external initiatives in this area, including the Contributor Roles Taxonomy (CRediT) could assist with this aim.
566. One challenge encountered in managing the author contribution queries arose from the guidance and criteria on the audit outcome to be applied in this event, which was open to different interpretations. This meant in the first instance that the audit team sought audit outcomes from the sub-panels, with an intention to remove any outputs deemed ineligible. As this practice was inconsistent with all other cases involving panel judgement, and with the approach described in the 'Panel criteria', on the advice of the REF Steering Group the REF audit team changed its process so that outcomes were incorporated within panels'

assessment. This required additional resource to ensure consistency in approach across all cases.

567. The second most common query related to correcting issues with submitted outputs, for reasons including corrupted or missing PDFs (sometimes in relation to the PDF retrieval issues outlined at paragraph 257), missing pages or elements of outputs, access or output quality issues, incorrect PDFs, incorrect attribution, or mismatching additional information. A much smaller proportion of queries related to evidence or additional clarity on eligibility issues, including outputs with significant material in common, and dates when outputs were first made publicly available.
568. The data adjustments for outputs primarily related to correcting the issues with submitted outputs, as described in paragraph 567. A small proportion of these adjustments related to the fractional staff queries, outlined above.
569. The most commonly raised audit query in relation to impact was a request for the corroborating evidence, where this had not been provided up front. The guidance originally required the upfront submission of corroborating evidence at the deadline, as recommended in the previous REF Manager's report. However, as a result of changes made to the exercise to mitigate the effects of COVID-19, the decision was made to change the submission of corroborating evidence from mandatory to optional (though HEIs that did not include corroborating evidence in their submissions did need to retain it in case of audit). Around 85 per cent of case studies were submitted with corroborating evidence. This high proportion clearly led to a significant reduction in requests for corroborating evidence through audit, when compared with the 2014 exercise.
570. Other commonly raised queries included requests for information or evidence to confirm the eligibility of the case study, or requests for the underpinning research outputs. The main audit outcomes for impact were that the evidence was passed to the sub-panel for consideration in the assessment (including the upload of corroborating evidence or provision of underpinning research outputs). The data adjustments for impact primarily related to adding the corroborating evidence files to the submissions viewer for the panels to access. A small number of the adjustments related to errors including incorrect PDFs, or title errors.

571. Queries raised on the environment typically related to identified discrepancies between the REF5b narrative and staff numbers or REF4 data. A small number sought clarification or evidence in relation to specific claims in the template. The main audit outcome was that the evidence was passed to the sub-panel for consideration in the assessment. The small number of adjustments for the environment related to identified errors in the template (for example, updating redactions) or REF4 data.

7.8 Audit reflections

572. Overall the audit procedures were proportionate and provided the panels with confidence in the accuracy of the information they were assessing. Nearly 3,000 audit queries were raised in total, during the assessment year across both central audit team and panel-instigated queries. As many of these queries included multiple staff or submitted items, it is difficult to draw a comparison with the REF 2014 data. Some of the differences around requirements for submitting staff likely led to an increase in the number of central audits. The data for panel-instigated audits suggest a comparable volume across outputs and environment, with many fewer seen for staff, and some reduction seen in the volume of impact queries (across both the sample and panel-instigated), likely on account of the upfront access to corroborating evidence and the more explicit inclusion of eligibility information within the case study template.
573. All 157 submitting institutions were audited, with some variation seen in the scale of audits. The average number of queries raised per institution was 18. The quality of institutions' data was generally high. There were some variations in the completeness of submitted data, but we did not find any institution that had repeatedly submitted inaccurate information.
574. A number of factors led to some delays with the delivery of the data verification programme during the assessment year. This included resourcing issues, the knock-on effects of additional activities from the COVID-19 mitigations (for example, the corrections period), and delays to delivering full audit system functionality. We corresponded with institutions in late 2021 to update them on the timeframe for remaining audit activity, which extended over a longer period than initially planned. In a future exercise, as well as giving thought to the best structure for the audit team in view of its different functions, the funding bodies

should ensure there is sufficient temporary resource available to support the sample audit processes (particularly for staff, where required).



8. Library

Key points

- The REF library was set up in Research England's offices. Due to difficulties in predicting the number of physical outputs, the shelving was over-provisioned.
- The library systems were procured externally and integrated with the wider assessment systems. We experienced technical challenges on rollout, but once up and running the library system received positive feedback.
- 13,176 physical outputs were delivered to the library. Effective packaging of physical outputs by HEIs varied.
- 31,177 dispatches were made to panel members during the assessment phase, including printed electronic items, as well as physical outputs.
- There was a high demand for printing that was exacerbated by the increased provision of electronic long-form outputs that were then requested in printed format.
- Support to panel members was provided by the library team; 95 per cent of panellists rated this support as 'very good' or 'quite good'.
- Output return to HEIs was completed successfully, although the returns period was a challenging one in terms of resourcing.
- For the library team to work safely onsite, measures were put in place to protect the team and prevent the spread of COVID-19.

Recommendations

- Provide more specific instructions to institutions on how physical outputs should be packaged in future exercises.
- Provide further clarity on the requirement to provide multiple copies of a physical output being returned more than once, for each UOA in which it is being submitted.
- Allow more flexibility around the electronic replacement of any missing physical outputs via the audit process, to avoid the physical submission of electronic items (e.g. on USBs).
- Ensure a tracking facility is available for all output dispatch routes in a future exercise.
- Explore the feasibility of providing pre-paid envelopes or labels for panel member output returns in future.
- Consider how processes could be improved to better support the exchange of physical items between panel members.
- Consider a recall function within the library system, to support the return of items on extended periods of loan.
- Consider spacing out the return period beyond one month or appoint additional resource to support the returns period.

8.1 Set-up

575. Space for the REF library was agreed as part of the wider estates provisions made for the transition of HEFCE's research and knowledge exchange functions into Research England, with this being located on the ground floor of RE's offices in Dominions House.
576. When the full details of the space were confirmed, we appointed external contractors to provide 150 bays of static shelving, resulting in 15 double-sided runs of 25 shelves per side, totalling 750 shelves. The library also had a dedicated packing area, a bank of computers and desks and three meeting rooms – two of which were used for storage of the boxes in which outputs had been delivered. The fit out was completed by 1 March 2021 and the library team began working onsite from 15 March. Due to the work-from-home mandate in response to the COVID-19 pandemic, the entirety of the ground floor was exclusively used by the REF library team.
577. A range of other supplies and equipment were purchased, including stationery and packaging materials, book and other trollies for transporting orders and deliveries, a rolling step-ladder to access the higher layers of the static shelving safely once the team had the necessary working at height training, two postal scales, a label printer, a comb binder (for printed, long-form outputs) and barcode scanners.
578. One element that provided a challenge to planning for the library provision was limited information on the overall volume of physical outputs expected. The overall number of physical items decreased significantly between the RAE and REF 2014, but it was unclear on whether this trend would continue. As set out in section 0, the Survey of Submission Intentions unfortunately did not capture the expected proportions of physical and electronic items that would be submitted, which may be worth revisiting for future. This led to the library shelving being slightly over-provisioned as the team had to plan for a larger number of outputs than was actually received.

8.2 Systems

579. We began exploring options for the REF library systems and staffing in 2019, reaching the conclusion that the library staff should be appointed directly to the REF team and an external system solution procured to manage the order, dispatch and return process. While the procurement process was delayed during the initial emergence of COVID-19 and consequent delays to the wider exercise, in mid-2020 we awarded the contract to provide outputs management software.
580. Part of the specification for the software included work to integrate it with the REF 2021 assessment systems. This aimed at providing a seamless experience for panel members in navigating between the assessment system and library ordering, including use of single sign-on across the systems and syncing between the two to ensure up to date allocations information was held in the library system. The integration of their software with our authentication system (Azure AD B2C) was achieved, however, it was not without problems and directly led to the user-account mix-up described below. Our specification had requested that the contractor have the ability to integrate; for a future procurement, it would be advisable to require that the software already integrates with our authentication.
581. The software package included the library ordering interface for panel members, which was linked to directly from within the PMW. This interface allowed panel members to view their allocated items, including the on loan status of any allocated physical items, order or reserve items for delivery (including printed copies of electronic items), view current order and loans information, and manage their delivery address. The software also included the outputs management system used by the library staff, '247Lib', which allowed the team to search for items and borrowers, and manage orders and returns.
582. Our experience of the externally procured systems highlights some of the risks involved in using this approach, despite a full and thorough procurement process. Considerable testing of the system was undertaken by REF library and development staff in advance of the library system release to panel members, which identified almost 100 issues – some functional and some cosmetic. Many of the raised issues were not addressed at all, or satisfactorily. Some of this may

be related to the late stage of testing, resulting from the wider delays to the assessment system set out in section 0.

583. One reported functional issue included a mix-up of user accounts. This was reported to the contractor, who investigated but could not replicate the issue. When the system was opened to panel members in late May, the issue became apparent again, creating the potential for a significant information incident. The library system had to be closed for two weeks at the beginning of the assessment phase, from late May to early June 2021, while the issue was resolved. This caused very significant disruption and delay to the library team and to panel members' access to physical outputs. During this two-week period, a temporary solution was put into place, enabling panel members to send orders to the library via email.
584. Overall, the library system received positive responses in our panel members' survey, with 84 per cent of those responding to the question rating it as 'very good' or 'good'. Comments in the survey indicated that, once up and running, several members found the library system worked very well and efficiently.

8.3 Operation

8.3.1 Deliveries from institutions

585. 135 HEIs arranged for a total of 13,176 physical outputs to be delivered to the REF Library, with deliveries made between 7 April 2021 and 28 May 2021. In line with the additional flexibility introduced in response to the effects of COVID-19 on output collation (see section 0), this included staggered deliveries from individual HEIs, and some additional or delayed delivery slots for institutions who had experienced difficulties. Receipts were prepared for deliveries, although only a select few institutions actually wanted a receipt when offered, and some had a receipt system of their own, and so this proved unnecessary.
586. Institutions were asked to arrange for their deliveries to be made to the Library between 9:30am and 16:30. Where HEIs had arranged their deliveries with courier companies, there was no guarantee of arrival time and outputs deliveries could arrive anywhere from 8:00am to 17:00. There were wider issues experienced with courier companies, including lost packages and delayed deliveries – often due to COVID-19. Some HEIs delivered in person, driving their

boxes of physical outputs in cars, hired vans, or the institution's vans, and this was agreed with the institution when arranging the delivery dates.

587. There was a wide variety of physical outputs sent to the library, from books, CDs, DVDs, USBs, large portfolios and electronic equipment, to creative artefacts. Effective packaging of physical outputs varied, with many outputs deposited to the library inside plastic poly pockets, paper envelopes, sandwich bands or similar solutions. These were very impractical, as often these external packages would be lost in transit between panel members along with their identification labels. The funding bodies should seek to provide more specific instructions to guide institutions on the best practices for how physical outputs should be presented in future exercises.
588. A common issue encountered was the provision of one copy of an output that had been submitted across more than one UOA. Our guidance on the deposit of physical outputs set out that if the institution was submitting the same physical output in different UOAs, a separate copy needed to be provided for each UOA. Guidance on this point may need further clarity in future exercises. The resolution of the issue in REF 2021 caused some confusion for institutions when queries were raised, and it also led to delays in HEIs having to then source another physical copy of the output within short timeframes.
589. As part of the measures to mitigate the effects of COVID-19, where an institution remained uncertain at the submission deadline about being to provide an output in physical form, they could submit the electronic version of the output by the submission deadline. Where physical submission became possible, the HEI could then subsequently change the output format to 'physical' during the corrections period that followed the submission deadline and return the item to the REF library. In these cases, the library team liaised with the REF audit team to process the change and record the item in the library system.
590. As this was introduced as a COVID-19 mitigation to support the best representation of the output, other changes – including from physical to electronic – were not permitted. Some physical outputs were delayed or missing when the initial deliveries of physical outputs were made to the library and in some of these cases institutions wished to provide the late/replacement copies in electronic format. As this was not permitted, it sometimes led to outputs being provided to the library as electronic items on USB sticks, simply to satisfy

the requirement to exist in physical format. While it is hoped the COVID-19 mitigations around physical outputs would not be required in future, it may be advisable to allow more flexibility around the electronic replacement of any missing physical outputs via the audit process.

591. In addition to the submitted outputs, the library also collected outputs that underpinned impact case studies, where these were requested by panels and were not available as PDFs. The outputs held in the library system had been imported from the submissions system at the outset of the assessment phase, so these additional outputs needed to be manually added to the outputs management system for the library team to process them. Panel members also needed to request delivery of these manually.

8.3.2 Output dispatch and return

592. From the period when the library system re-opened in June 2021 until the end of the assessment period, 31,177 items were reserved and issued to panel members. This includes the dispatch of printed electronic items, as well as physical outputs. The busiest periods for orders were in June, July, and August 2021. January and February 2022 were the busiest periods for returns. Reflecting the different nature of material submitted across the UOAs, dispatch numbers by sub-panel vary considerably. Sub-panels 32 (Art and Design: History, Practice and Theory) and 27 (English Language and Literature) had the highest proportions of physical output dispatches, together reflecting 40 per cent of the total.
593. For output dispatch to panel members, we used a contracted courier service as well as Royal Mail. The courier service was largely consistent in delivering and collecting packages successfully, with a tracking service usefully helping to resolve the odd situation where a package was mixed up. No packages were lost through use of the courier service.
594. There were a larger proportion of packages under 2kg that would have been economically inefficient to dispatch via the courier service. For these packages, we used Royal Mail via the existing postal service arrangements within the OfS estate. Unfortunately, this meant we could not use any tracking or recorded delivery. For most cases, delivery was successful, and the package was received by the panel member. However, there were situations where a delivery would either arrive considerably late, or get lost in transit (including for returns), and

so the physical output would have to be replaced at expense and would delay the assessment for the panel member. The funding bodies should ensure a tracking facility is available for all dispatch routes in a future exercise.

595. International dispatches were arranged through Parcelforce on most occasions, and due to the customs complications caused by Brexit, these were often delayed by weeks, and in a couple of cases, months. This required administrative work from panel members to provide documentation or information electronically in order to receive their package. In many cases additional customs fees were charged to panel members, who had to claim these back via expenses.
596. For output return, panel members could either post back packages via Royal Mail and claim expenses, or request a courier collection. In the former approach, we were not able to provide pre-paid envelopes or labels. This issue was a common point raised in our panel members' survey, as it contributed largely to administration workload for panel members. There would be value in exploring the feasibility of providing this facility in future. Various courier services were used to collect returns from panel member, with differing experiences across these. Those that were most effective provided a narrow window for delivery and a 'courier bring' label option, saving the separate provision of these by the library team.

8.3.3 Printing requests

597. Panel members could order printed versions of electronic items (including outputs, case studies and environment templates) in the same way as physical outputs, on the library section of the PMW. One of the effects of COVID-19 on submissions had been an increased drive towards electronic output submission, including for long-form outputs.
598. As noted above (paragraph 348), the high demand for printing that was also seen in REF 2014 was exacerbated in REF 2021 by the increased provision of electronic long-form outputs that were then requested in printed format by panel members for review. Where a long-form output was requested in print, its status was changed to a physical output so that the printed version could be shared for review rather than it being printed multiple times.

599. The status change to physical for long-form printed outputs means that data on total printing requests can not accurately be derived. The number of printed item dispatches not including the long-form items totalled over 6,500, with two thirds of these being (non-long-form) electronic outputs. The proportion of requests varied substantially across panels and were primarily centred in Main Panels C and D, with very low levels of requests received from Main Panels A and B. Sub-panels in Main Panel C requested nearly 80 per cent of the total printed non-long-form electronic outputs and 88 per cent of the printed impact case studies. Sub-panels in Main Panel D requested over 67 per cent of the printed environment statements.
600. The library team also fulfilled printing requests from panel members for assessment guidance material and panel meeting documentation, such as meeting agendas, minutes and discussion points. These materials were supplied to the team by chairs or secretariat, so no additional administrative workload was necessary in sourcing these.

8.3.4 Guidance and communications with panel members

601. We provided multiple forms of guidance for panel members to access the assessment system, and the procedures and processes involved in ordering, and returning, outputs from the Library.
602. The guidance included a library section in the assessment system 'Panel User Guide', with visual and textual instructions on how to use the reading list on the PMW to request and order assessment material; 'procedural guidance' with instructions on ordering, and receiving material from the library, and returning material to the library; a REF library demonstration video related to accessing the library system; a REF library set of FAQs to quickly address any immediate queries members may have, without having to wait for an answer by email or telephone.
603. Guidance was also supplied for the panel secretariat, concerning requests for the library to print sub-panel papers, such as agendas, minutes or assessment guidance.
604. The REF library had an email inbox on the secure panel communications system, to which queries could be directed and from which individual responses as well as general updates to members could be sent. While many members did

use the library email, there were still some who went via their panel secretary, or who directed queries to the REF admin or user support inboxes, who would then forward the query to the library to be resolved. More could be done in future to ensure members are clear on who to contact in which circumstance, to support them in the most efficient way.

605. Commonly raised queries related to:

- Not yet having received an order. These were especially frequent during the period at the outset of the assessment when the library system was taken down.
- Outputs which were already on loan to another panel member. Some frustration was expressed in our survey of panel members about having to wait for outputs held by other members. While there was tracking available in the system, it is clear that this did not fully support the exchange of outputs between members and that more consideration may need to be given to the supporting processes for this in future – although some of these issues may be eased where panels have more in-person meetings.
- Requesting material off-system, for example where there were issues accessing the system or for underpinning research outputs that were not captured in the library system. This required manual workarounds by the library team to dispatch the material.
- Returning outputs. Queries related to processes, including those around using the ordinary post and the logistics around a courier collection. As noted above (paragraph 596), there was particular frustration around the lack of pre-paid envelopes or labels for return. A further common theme in survey responses related to unreliability of the courier services, where couriers may not arrive to collect packages, or where there was too much uncertainty around when couriers might deliver or collect packages, while providing institutional addresses meant that sometimes the driver could not find the correct location.

606. Panel members who frequently queried the library and established a working relationship were appreciative of the service they received. In our survey of panel members at the end of the exercise, the majority of members were very positive on the support provided by the REF library team, with 95 per cent rating the support as 'very good' or 'quite good'.

8.3.4 Returning outputs to institutions

607. In January 2022, we contracted a courier service to prepare for the return of outputs to institutions in March. Also at this time, we sought lead contact details from institutions to begin arranging the deliveries. Deliveries were arranged by routes, with institutions included in a route depending on both their geographic location, and their own advised restrictions on delivery dates. There were 22 routes in total: four in Scotland and Northern Ireland, two in the North West, two in the North East, one in Wales, three in the South West, four miscellaneous routes, three in the Midlands, and three in London.
608. Institutions were informed of their delivery date at least 2 weeks before, and then provided with a confirmation email at least one day before their delivery date, which provided them with the estimated time of delivery. The email also listed the outputs that had been packed, and any missing outputs. On a few occasions, requests were received to rearrange dates, which were accommodated where possible.
609. The deadline for panel members to return outputs to library was 21 February 2022; however, earlier communication of this date may have helped the returns process as there were still 1,300 outputs on loan by the deadline. Additionally, a recall function may be beneficial within the system, which would automatically provide notice to panel members when an output has been on loan for an extended period – this may also help alleviate delays experienced by members awaiting loaned items.
610. Ongoing communications by the library team saw the outstanding returns reduce to 240 by the beginning of March, when deliveries back to institutions commenced. Outputs continued to come in after this point, including those lost in transit or where institutional postal systems had finally made their way to the library. It was then necessary to arrange directly with HEIs to courier these outputs back to them separately. Around 60 outputs were considered lost and missing by the end of the process and needed to be replaced to be returned to HEIs.
611. The returns period was a challenging one in terms of resourcing as there was a reduced library team and a courier collection first thing almost every single working day in March. The library team managed to keep ahead of the schedule by at least two days, but the intensiveness of this period was further

exacerbated by COVID-19 related absences among the library staff during this period. In future, it may be advisable to either space out the return period beyond one month or appoint additional resource to support the returns.

612. A small number of issues arose with returned items, such as mismatches between outputs and the labels on external packaging, or signs of damage or annotations. These issues may have been avoided with additional capacity for a more extensive stock check prior to return.

8.3.5 Impact of COVID-19

613. For the library team to work safely onsite, measures were put in place to protect the team and prevent the spread of COVID-19. The entirety of the ground floor of Dominions House was designated for the use of the library team, and the layout was organised to provide adequate social distancing. Regular cleaning was provided by contractors liaising with OfS, and sanitising wipes and hand-gel was provided with good health practices advised to maintain cleanliness. The prominence of these measures was higher at the beginning, and strictly maintained, but were always present throughout the process.
614. Specific measures were put in place to limit the risk of exposure or spread of COVID-19 through transmission on surfaces. These measures included quarantining arriving packages up to three days, using gloves or sanitizing hand-gel to handle outputs and cleaning surfaces. All of these contributed to additional time required to complete the unpacking and cataloguing procedures. Outputs were kept in quarantine on specified areas of shelving for 72 hours and were re-shelved or dispatched on the fourth day following arrival, typically.
615. The quarantine section was maintained until August 2021, when a survey was sent out to panel members, who responded in agreement that a quarantine section was no longer necessary. The end of the quarantine period was predominantly after the busiest period of ordering from June to August, where the additional time spent on maintaining the quarantine and workload required was a necessary difficulty.



9. Results and outcomes

9.1 Publication of results and submissions

Key points

- The REF results were published successfully and on schedule on 12 May 2022, and received widespread coverage in the media. The results site received approximately 60,000 visitors on results day.
- Summary analyses and data were published alongside the results.
- The main panel overview reports were published and the confidential feedback to HEIs provided ahead of schedule in May 2022; the advisory panel reports followed on schedule in June 2022.

Recommendations

- Consider scheduling in at the outset a seven to eight week period between results sign-off and publication while also considering ways to mitigate the risk around keeping results confidential
- Build in more dedicated resource for results analysis in a future exercise, to ensure there is sufficient opportunity to analyse the results in detail in good time before publication, as well as ensuring sufficient resource to translate this into communications materials.
- Consider continuing to align the results and main panel report publication in future, giving time for sufficient planning and resource to be put in place to support this.

9.1.1 Decisions on publication approach

616. Key decisions in relation to the publication of results were taken early in the exercise and detailed in the 'Guidance on submissions'. This included following the approach taken in 2014 of publishing the overall profiles in steps of one per cent, publishing the sub-profiles alongside the overall profiles, and confirming up front the licensing arrangements under which the case studies would be published (under a Creative Commons Attribution 4.0 International licence). The terms and conditions for submission later clarified that this licence extended to all published submission data.

617. The guidance also set out key decisions in relation to the some of the new features of REF 2021. In line with the more unit-focused approach in the exercise,

and in response to consultation feedback, it was confirmed that staff names would not be published at the end of the exercise. It was also confirmed that the proportion of eligible staff that were included as Category A submitted staff in the submission would be published alongside the results.

618. In autumn 2021 we wrote to institutions with more information about the publication of results. This firstly confirmed the specific date on which the results would be published, flagging a change to the previous April date set out in the 'Guidance on revisions' to the 12 May 2022, in view of a pre-election period due to be in place in April and early May. The letter also recapped the details of what would be published, and provided information about when the REF team would provide institutions with their own results ahead of publication.
619. We provided further information in January 2022, detailing the timings for providing briefings and sample data to institutions, and summarising the outcomes from user research on the design of the results site. This letter also confirmed the decision taken by the REF Steering Group to round the data on the percentage of eligible staff submitted to the nearest five per cent, and to cap this figure at 100 per cent. This decision was taken in recognition of remaining issues in fully reconciling the HESA and REF staff datasets.
620. While communications about the intention to publish this figure had been set out in the early guidance and in the later correspondence to institutions during the assessment year, some queries we had about these figures from institutions in early 2022 highlighted the potential of some misunderstanding or unclear expectation about what would be published. To support institutions in the lead up to submissions, in April 2022 we added a new report to the submissions system that would allow institutions to see the rounded figures on the percentage of eligible staff submitted, as they would be published. Institutions could contact the REF team where they wished to discuss the figures.
621. In response to this provision, we received a small number of queries. Some of these required only further clarification of what the figure showed, indicating some misunderstanding about the distinction between Category A eligible and Category A submitted staff. This process helped inform our development of guidance and definitions for the published results, to ensure clear and accessible information on the '% eligible staff' data was provided. A handful of data adjustments were also made at this stage to RE's copy of the HESA data from which the Category A eligible figure was calculated. These typically related to the

inclusion of ineligible staff in the eligible pool that had not previously been picked up during the HESA adjustment period in April 2021. Our experiences of working with HEIs on the percentage eligible figures during April 2022, as well as some feedback post-results, suggests that more communication work was needed to ensure full understanding of the data and its planned publication across all institutions.

9.1.2 Preparing for publication

622. The results were signed off by the main panels, and final oversight provided by the main panel chairs' group and the REF Steering Group, in the final meetings scheduled across March 2022. Some of the main panel meetings had been pushed back slightly into March, in view of the changed publication date, to provide additional time for sub-panel work to complete (primarily around reports and feedback). Thereafter, each funding body's board (or equivalent) was briefed on the REF outcomes.
623. The additional time between signing-off the outcomes and their publication in May that was afforded by the pre-election period in April was helpful for the REF team to finalise data and processes prior to publication – including the small number of adjustments to the HESA eligible staff data, as described in paragraph 621. In a future exercise, the funding bodies should consider scheduling in at the outset a comparable time period (seven to eight weeks) between results sign-off and publication, while also considering ways to mitigate the risk around keeping results confidential.
624. The Head of REF Policy, supported by the REF Policy Adviser, led on the planning and delivery of the communication of REF 2021 outcomes. This covered the project planning of the release of REF outcomes, preparation of written material for publication, communications workshops with each main panel area, as well as organisation of a press conference and co-ordination of media requests for comments. Oversight of this work was provided by a Results Communications Steering Group, comprising members from UKRI, Research England and the devolved funding bodies. This group also oversaw the development work on the REF results application.
625. A Senior Communications Manager from HEFCW was seconded to the REF team on a part-time basis for three months to provide communications expertise, including drafting communications materials. We also commissioned media training for key members of the REF team. This training included a session on

writing responses to media queries and a session on conducting press conferences and media interviews. The REF team also liaised closely with UKRI comms in the development of communications, including material for the UKRI website and contact details for key media stakeholders.

626. A results briefing event in the form of a webinar for HEI press officers took place in late March 2022, attended by approximately 350 delegates from institutions, and an additional results briefing event for institutions submitting to REF for the first time was held in early April 2022. Following feedback from institutions, the REF team also produced a results 'press pack' for HEIs. This press pack contained guidance on interpreting the results and speaking to the media as well as social media hashtags, official REF logos and accompanying usage guidance, and an embargoed copy of the results press release.
627. The REF Development team provided institutions with sample (dummy) results data around two months ahead of the results publication date, to give advance notice of the format of the final REF 2021 results files that would be made available via the REF submission system to the institution's authorised submitters. In response to queries received, we later also provided a sample file illustrating what the comparative data would look like.

9.2.3 Publication of results and analysis

628. HEIs received their own results under embargo on 9 May along with the comparative data,⁷² and then all institutions' results under embargo on 10 May, ahead of the results publication date of 12 May. The use of the submission system worked well for this purpose and included functionality that required institutions to agree to the terms of the confidential early data provision. A small number of authorised submitters encountered a technical issue in progressing past these terms on 9 May; however, this was quickly resolved by the development team, allowing all authorised users to access the results information within the first hour of their release.
629. The REF team worked with the Science Media Centre (SMC) to organise and host a press conference on 11 May, ahead of the publication of REF 2021 outcomes the next day. SMC provided facilities to host the conference as well as advice on attendees and format. We provided press contacts with the results data under embargo in advance of the press conference via Sharepoint, which had sufficient

⁷² The comparative data is available to view at www.ref.ac.uk under 'Results and submissions/Results analysis'.

functionality for us to control access and ensure those accessing the results ahead of publication first confirmed their agreement to the terms under which they were being shared until the point of publication. We also prepared a key-facts leaflet⁷³ and an online Guide to the REF results⁷⁴ to support the results publication.

630. The results were published successfully and on time at 00:01 on 12 May 2022. Data captured on use of the results application in the first hour (00:01 to 01:01) it went live show a total of over 5,000 users in this period. Over the course of the day on 12 May the site received approximately 60,000 users overall with a peak of just over 15,000 concurrent visitors at 09:00.
631. Institutions made widespread use of social media to disseminate and discuss their results and generated extensive local and regional media coverage. REF was trending at number 2 on Twitter on 12 May. In the first week following publication, approximately 40 online articles/blogs from national media outlets covered the REF results.
632. In addition to celebrating the clear successes of UK research that were demonstrated through the results – across all countries and regions of the UK – a further aim of our communications approach had been to convey the main differences between the current and previous exercise, which meant the outcomes from 2014 and 2021 could not be directly compared (particularly for outputs). This aim was well-achieved, as reflected in the widespread media coverage. Many reported either on the regional dimension of the results, or that changes to the submission rules had allowed more excellent research to be captured. As expected, the research press produced league tables using different methods – with some open acknowledgement of their limitations and alternative views available.
633. To go alongside publication of the results, the REF team and RE analytical colleagues prepared a set of analyses on the results and submissions data. These substantially drew on the types of analysis that had been produced in REF 2014, accounting for key differences between the exercises as appropriate. The process of working collectively on this was positive, however, resourcing constraints within the analytical team limited the scope of what we were able to produce.

⁷³ 'Key facts' leaflet, available at www.ref.ac.uk under 'Guidance on results'.

⁷⁴ 'Guidance on the REF results', available at www.ref.ac.uk under 'Guidance on results'.

Additionally, some late-arising issues around data inconsistencies between the REF team and analytical colleagues' datasets slightly delayed the publication of the analyses, which were made available in the afternoon of 12 May 2022. The funding bodies should consider building in more dedicated resource for results analysis in a future exercise, to ensure there is sufficient opportunity to analyse the results in detail in good time before publication, as well as ensuring sufficient resource to translate this into communications materials.

634. We also published summary data for each UOA, providing information on the total staff, outputs and REF4 data returned into that UOA, as well as summary data on outcomes. Through consultation with the main panels and secretariat, we revised the presentation of results data in these summaries. In contrast to the PDF format in which these were produced in 2014, we were able to incorporate these within the results application, improving accessibility and navigation for users.
635. The submissions data were published in June 2022, although we encountered some technical difficulties in its first release (see below, paragraph 647). This included publication of the impact case studies in a searchable database, as well as searchable databases for submitted output details and environment data and statements.

9.2.4 Publication of reports and confidential feedback

636. During the latter part of the assessment phase, each main panel produced an overview report, which included a discrete section from each sub-panel. The reports described how the assessment was carried out, provided an overview of the panels' observations about the state of research in the areas falling within its remit, and general reflections on the submissions and their assessment⁷⁵.
637. The reports were primarily prepared by the main and sub-panel executive groups, with review and input from the wider membership. The REF team provided a template and guidance to panels on the purpose, level of detail and recommended approaches to producing the reports. The guidance also included guidance from IDAP on reporting on IDR in the reports. The REF team provided data for inclusion in the reports on a consistent basis, including on submissions, output types, cross-referrals, and REF4 data. The panel advisers across the main panels worked together to identify where a common approach to reporting was

⁷⁵ The main panel overview reports are available at www.ref.ac.uk, under 'Publications and reports'.

required, and the overall level of consistency was reviewed by the main panel chairs' group in March 2022.

638. We received feedback from the main and sub-panels during the final meeting rounds of the assessment phase about the length of time between the publication of results and the reports (scheduled alongside submissions publication in June). It was felt that earlier publication of the reports would help support chairs and members in their communications and engagements on REF in the period shortly following the publication of results. We therefore brought forward the timeline for publishing these from June 2022 to the week following results publication. While this placed some additional pressure on the REF team to prepare the designed versions of the reports, the earlier publication timing was welcomed by both panels and institutions. The funding bodies should consider the continued alignment of results and report publication in future, giving time for sufficient planning and resource to be put in place to support this.
639. Reports from the advisory panels, IDAP and EDAP, were finalised towards the end of the assessment phase and published on schedule in June 2022.⁷⁶
640. During the assessment phase the sub-panels produced confidential feedback for each submission, which we provided in confidence to heads of HEIs. Following a working group convened at the outset of the assessment phase to inform the guidance on confidential feedback (see section 0), the REF team provided a detailed guidance document to panels that included standardised phrasing to draw on and some sample feedback statements for illustrative purposes.
641. Drafting of feedback statements was typically undertaken by individual or small groups of panellists, as planned within each sub-panel. To support the sub-panel executive groups with producing and collating the feedback, we incorporated feedback spreadsheets into the assessment systems and added a feedback report, that showed the feedback as it would be presented to institutions, alongside the quality profile for each submission.
642. Following the completion, upload and sign-off of feedback statements by the main and sub-panels, the REF team undertook a comprehensive check of the data accuracy (in terms of feedback for the correct submission). This proved to be a successful process overall, although not without a small number of errors. After

⁷⁶ The advisory panel reports are available at www.ref.ac.uk, under 'Publications and reports'.

we had circulated the feedback we had around eight enquiries (out of 1,878 submissions) as to the accuracy of the feedback statement received, of which five were identified as having drafting or transcription errors, and a corrected copy of the feedback was provided. A very small number of further queries were received on the feedback, typically relating to additional clarification. In most instances, the feedback queries involved further liaison with the relevant sub-panel chair. To help reduce the manual aspect involved in a future feedback review process, it would be helpful to require the name of the submitting institution in each feedback statement drafted by the panels, which could then be validated on an automated basis in the assessment system prior to circulation.

643. We were able to circulate the confidential feedback to institutions via the submission system slightly ahead of schedule at the end of May 2022. These were intended to be read in the context of each panel's overview report, which had been published shortly beforehand on the REF website.

9.2 Results systems development

Key points

- The results application was successfully developed, with key input from user research.
- Technical issues were encountered in the release of the submissions data.

Recommendations

- Ensure effective communications with institutions on redactions guidance and explore technical approaches to validating compliance within the system.

644. Development work on the REF results application began in earnest from November 2021. The results application (including results and, later, submissions) was developed on the Azure platform on which we hosted the suite of bespoke REF systems. This was integrated with the public REF website, but hosted separately on its own sub-domain. The development work included commissioned user research with institutions, which explored use cases for the REF results and views on how well the REF 2014 results site had served users' requirements. A key outcome from the user research was recommendations for prototype site, which was then used as a basis to refine user stories within the REF team. A user workshop with institutional research professionals and demonstrations of the site to the Results Communications Steering Group provided excellent feedback on the developing design. Further demonstrations,

testing and user-acceptance testing was undertaken in early 2022, providing positive feedback and some useful suggestions.

645. The development work for the results element of the results application was complete by March 2022, with work continuing on the submissions elements (including the impact case study database). During this period, further user research was undertaken to support the restructuring of the main REF website following results publication. Once the structure was finalised, integration of the results application was then completed.
646. The submissions element of the results application was launched in June 2022, however, we experienced technical issues with the UK location tagging in the impact case study database. In the previous exercise, the development work for the case study database was undertaken as part of the wider contract to analyse and publish the case study data in a reusable format. The development work for 2021 was planned to be, and was, delivered by the REF development team; however, some elements that were linked with analysis work (including some of the case study tagging) were due to be delivered by further commissioned work. While the analysis work for 2021 has been commissioned, delays to its schedule meant that the main tagging work was requested from the REF development team. This required further skills development within a short window. Additionally, it came to light following publication that a small number of institutions had incorrectly redacted case studies using formatting (instead of removing the text) in submitted documents, which meant the redacted text had been captured in the case study database.
647. To fix these issues, we temporarily removed the submissions data shortly after publication. We were able to restore the outputs and environment data the following day; however, due to complexities within the tagging process, the impact case study database was subsequently relaunched after nine days. To avoid the redaction issue arising in a future exercise, the funding bodies should ensure effective communications with institutions on the importance of following the redactions guidance provided, and might wish to explore technical approaches to validating this in the system.



10. Project management and governance

10.1 Staffing and structure

Key points

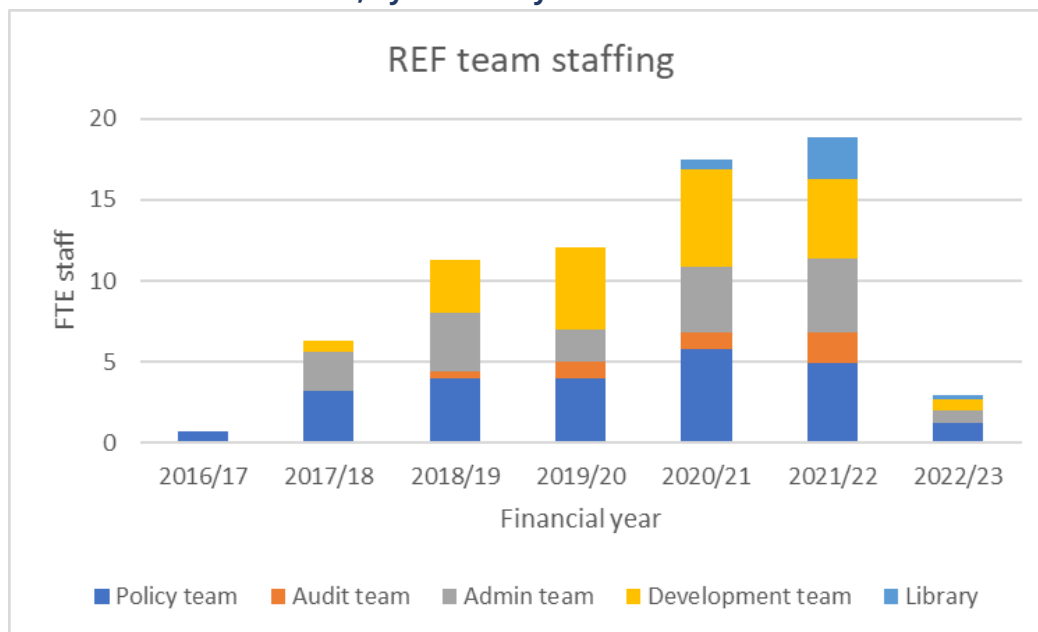
- The REF team was established from 2017; at its peak of activity, nearly 19 FTE staff supported the REF.
- Staffing projections for the 2021 exercise that drew on precedent from REF 2014 underestimated the resource needed to deliver REF 2021; resourcing pressures were also increased in light of the effects of the COVID-19 pandemic.

Recommendations

- Ensure dedicated resource across supporting services is fully factored and costed into staff resource estimates from the outset.
- Adopt a more formalised approach to flexible resourcing, to allow greater responsiveness to unexpected resource peaks while delivering the exercise.
- Replicate the admin team resource and structure that was in place at the end of the exercise, including both a senior admin manager and an admin manager for panel processes.

648. The REF team was established in 2017 with the appointment of the deputy manager (later Head of REF Policy) and the REF manager (later director) in January 2017. The team was initially based at HEFCE, until April 2018 when it transitioned across to Research England. Across the exercise, the team worked on behalf of all four funding bodies, who were each represented on the REF Steering Group (see section 0).

649. As the initial decisions began to be defined, and the preliminary budget for the exercise agreed, staff recruitment for the roles required commenced. Staff required for the whole of the exercise were recruited on open ended contracts and staff required for specific phases of work were recruited on temporary contracts. Figure 4 below summarises the staff complement for the REF team, broken down by financial year and function. It does not include staff resource from the funding bodies that supported the REF project at key stages, for example, analytical resource. Neither does it include the panel hosts (beyond those already employed in the REF team), who were drawn from across the funding bodies or appointed on temporary contracts in FY 2021/22.

Figure 4: FTE of REF team staff, by financial year and function

650. The team structure, at its full complement, is shown in figure 5.

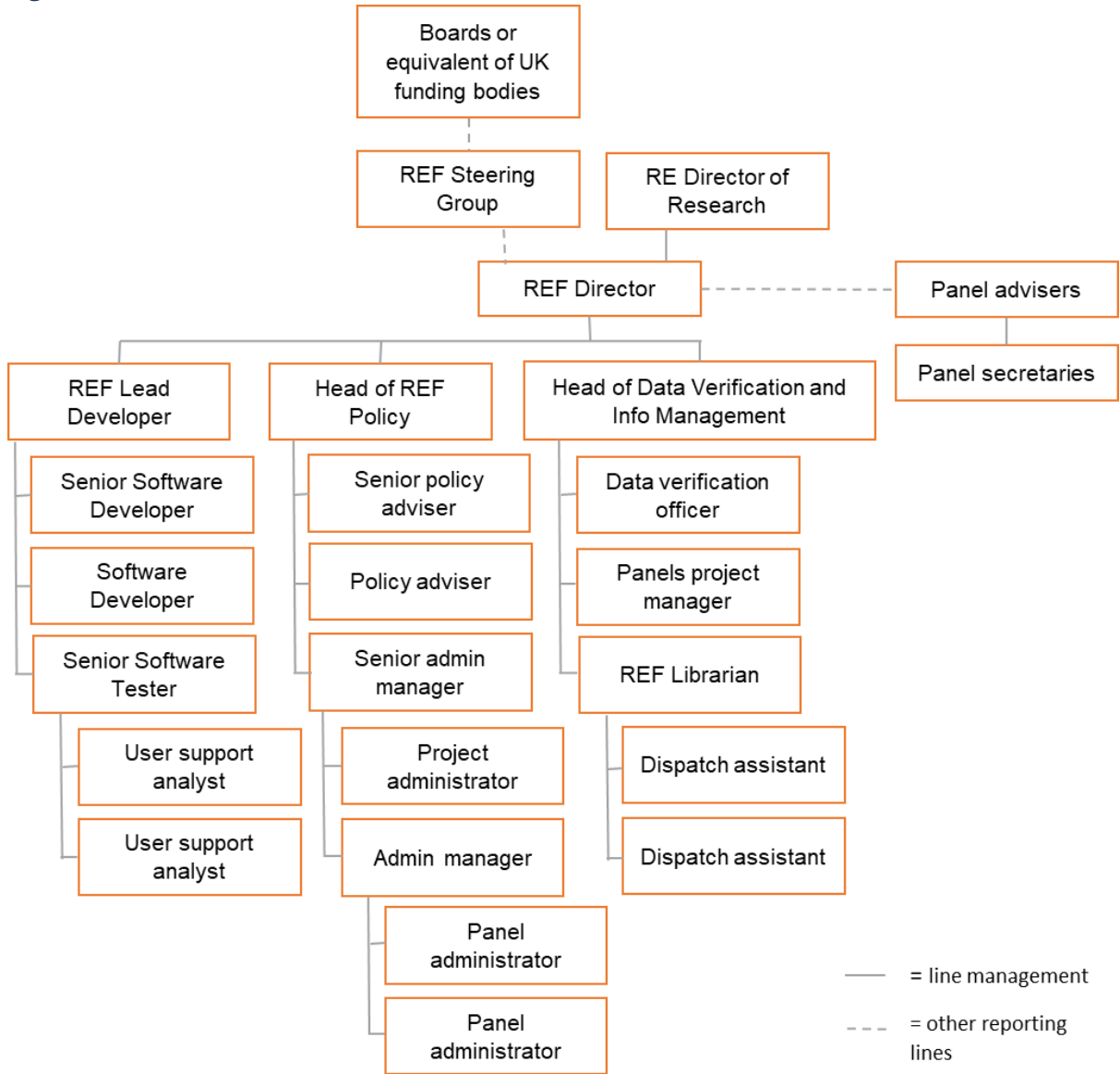
651. A lot of the staffing projections for the 2021 exercise drew on precedent from the previous exercise. However, the organisational change from HEFCE to RE, as well as key differences between the two exercises and the implications of this for resource requirements, made the REF 2014 staffing structure a significant underestimate of the resource needed to deliver REF 2021. For example, the nascent development of the communications function within UKRI meant that early on in the exercise the REF team took on direct management of REF-related communications, including management of web content and social media activity.

652. Resourcing pressures were also increased in light of the effects of COVID-19, with these particularly felt by the team during the assessment year; however, recruitment processes within UKRI were not agile enough to respond effectively to these pressures, and there was limited additional resource available to draw on from across the funding bodies. To help mitigate similar issues arising in a future exercise, the funding bodies should ensure dedicated resource across supporting services – for example, communications, analysis – is fully factored and costed into the staffing estimates from the outset. A more formalised approach to flexible resourcing (for example, from within the funding bodies, or via an awarded contract with an agency) should also be built into the staffing structure, to allow greater responsiveness to unexpected resource peaks while

delivering the exercise. Recommendations made elsewhere in this report (for example, around temporary resource for audit, and staffing advisory panel committee servicing through external secondees) would also help mitigate some of the resourcing pressures the REF 2021 team faced.

653. Resource pressures on the admin team were exacerbated by the reactive nature of the work in response to the pandemic; however, the team was under resourced for the volume of work it needed to deliver, particularly from 2019 onwards. While some system updates to the PMW and panel admin tool might address some of this, it is recommended that the final admin team structure in place is replicated in future. This includes a senior admin manager, who is responsible for project planning, financial reporting and oversight of delivery processes, and an admin manager who is responsible for leading the panel administration and event organisation elements, including line management of panel administrators.

Figure 5: REF team structure, 2021



10.2 Project planning

Key points

- Initial project planning drew substantially on the timetable for REF 2014; delivery of the exercise was significantly disrupted by the COVID-19 pandemic and required additional contingency planning.
- The programme overall was delivered in accordance with the revised schedule set out in June 2020; however, the impact of COVID-19 contributed significantly to some delays to deliverables during the process.

Recommendations

- Separate out the project management role from the policy head role to ensure it has dedicated resource across the lifecycle of the exercise.
- A full review of the roles required for the systems development team should be undertaken in planning for the next exercise, in accordance with the approach to systems provision that is taken.

654. The initial planning for the REF 2021 timetable drew substantially on the delivery of REF 2014. This included the division of the exercise into three principal phases, following the confirmation of the high-level framework: the criteria phase (2018); the submissions phase (2019 to 20); and the assessment phase (2021). An overall project plan for the exercise was developed, reviewed periodically and progress reported against this plan to the REF Steering Group. From early 2020, this timetable was substantially altered when the REF was delayed by four months, due to COVID-19.

655. To manage and oversee delivery of the work throughout the exercise, the programme was divided into different workstreams, relevant to the phase of the project. Each workstream had an 'owner' from within the REF team, who was responsible for undertaking the more detailed planning for its delivery. The REF team held weekly team meetings and quarterly whole-team planning days as part of the management of the programme. The weekly team meetings were vital for keeping track of progress, particularly during the virtual stage of the exercise; the planning days were invaluable to delivery, ensuring key milestones for each workstream was captured, supporting members across the team to understand the wider priorities and context of their own work area, and flagging potential pinch points. They were also well-spaced chunks of time that seemed manageable, but also gave sufficient forward look.

656. In addition to these meetings, in line with the agile development approach, the REF development team held daily 'stand-ups' to review immediate progress and priorities. This was a successful model and could be extended out across all the sub-teams in a future exercise, especially during pinch points.
657. From March 2020 onwards, the REF admin team also held a daily 'stand-up' style meeting, the team previously met formally on weekly basis when all members were office based, with opportunities for informal catch ups as required. Due to the high volume workload, the reactive nature of the work in response to COVID-19 and the change to fully remote working, the daily meetings were essential in ensuring the team's daily priorities were clear and progress accurately tracked, any arising issues were discussed, and resource was allocated accordingly to manage the work. It would be beneficial for the future team to adopt a similar approach, especially where remote working is the primary working method of the team.
658. In early 2020, when the full impact of the pandemic was beginning to emerge, the REF team undertook detailed contingency planning to look at risk across the exercise and on internal resourcing, and consider mitigating actions. Planning for the immediate work to deliver revisions and a new timetable for the exercise was necessarily responsive (as it again became in January 2021, when further mitigations were introduced). While much of the timetable could shift forward by four months, other aspects (such as the advance review of staff circumstances and panel nominations) either continued largely in line with the original timetable, or were delivered on newly revised timetables specific to that activity.
659. Project planning for the exercise overall sat within the remit of the Deputy REF manager (later Head of REF Policy); however, the policy demands of this role were significant, particularly during the very reactive phase in response to COVID-19. While project planning was delivered effectively, aided through the mechanisms described above, it would likely be beneficial in a future exercise to separate out the project management role from the policy head role to ensure it has dedicated resource across the lifecycle of the exercise. Such a role could also incorporate wider governance responsibilities, including with the REF Steering Group, risk and budget management.

660. Resourcing issues within the development team also limited the amount of time that could be dedicated to systems project planning. During some periods, therefore, this was supplemented through resource from elsewhere in the REF team. A full review of the roles required for the development team should be undertaken in planning for the next exercise, in accordance with the approach to systems provision that is taken.
661. The programme overall was delivered in accordance with the revised schedule set out in June 2020; however, the impact of the COVID-19 pandemic on our work and capacity contributed significantly to some delays to deliverables during the process that are described elsewhere in this report – including the delivery of the assessment systems, and some audit processes. We also experienced delays in working with some internal UKRI processes, including recruitment (as outlined in the above section) and procurement, which in hindsight needed to commence further in advance.

10.3 Governance and information management

Key points

- Effective oversight of the exercise was provided by the REF Steering Group.
- Processes were put in place to manage risk and personal data effectively, and ensure the confidentiality of information.

Recommendations

- For any future exercise, it is recommended that a data sharing agreement between the funding bodies is put in place at the outset, with a draft made available to the steering group to review and approve at its first meeting.

662. The REF team's work was overseen by the REF Steering Group, which represented the four UK funding bodies. The group was first convened in September 2016. It was chaired by the Director of Research (at HEFCE, then Research England) and serviced by members of the REF team. It typically met three times a year; however, during the period from early 2020 when we needed to rapidly develop and keep under review COVID-19-related contingency measures, the group tended to meet more frequently. This extended into the assessment year, as contingency measures for the panels were under consideration.

663. The steering group had responsibility for matters of policy and the programme of work, agreeing collective recommendations on the high-level framework, and

reporting to and seeking decisions as necessary from each of the funding bodies' respective boards, chief executives or equivalent. The group also signed off key guidance developed by the REF team, gave oversight to key implementation risks, and agreed the draft REF budget to put forward for approval by the funding bodies. The group also drew attention to matters of importance or sensitivity within the devolved territories, and acted as the final arbiter in REF 2021-related appeals or complaints.

664. From the outset of the process, we developed a comprehensive risk register which was reviewed regularly by the team and reported on as a standing item at REF Steering Group meetings. This drew on the broad approach followed in REF 2014 in identifying four broad areas of risk (detailed below), with detailed risks, mitigations, owners and activity status listed within each area:

- Failure to gain and maintain stakeholder confidence
- Project not implemented effectively
- Assessment method is not robust
- Undesirable behaviours

665. We also undertook COVID-19-related risk assessments around in-person meetings, to inform decisions around the timing for returning to this meeting format, and any measures or mitigations that would need to be put in place.

666. As the REF involved collecting and processing a large volume of personal data, privacy and confidentiality issues were carefully considered. We were well-supported both by Research England governance and by the UKRI Knowledge and Information Management team in our approach to information management.

667. The broad principles of how REF personal data would be managed were set out in the 'Guidance on submissions'. However, our stated intention in this document to provide HEIs with a model privacy notice inadvertently conflated the HEI's legislative responsibilities with UKRI's, which caused some confusion in the early part of the submissions phase. In order to clarify the position, we instead provided Model REF data collection statements⁷⁷ for staff submitted and / or named in narrative elements of submissions, and separately provided a Fair Processing Notice⁷⁸ for staff submitted to REF 2021.

⁷⁷ The Model REF Data Collection Statement for institutions is available at www.ref.ac.uk under 'Data management guidance'.

⁷⁸ The Fair Processing Notice for staff submitted to REF 2021 is available at www.ref.ac.uk under 'Data management guidance'.

668. During the process of appointing the panels, each appointee was required to confirm their agreement to the confidentiality and information security arrangements in place to support panels in handling confidential data generated by the panels or to which they had access. The arrangements set out panellists' obligations around maintaining the confidentiality of this information, including use of the secure systems provided for working with such information.
669. While the exercise is jointly run by the four funding bodies, the data controller is UKRI. During the development of the Codes of Practice Complaints and Investigation process it became clear that there would be a need to share data for this process in the event of an in-scope complaint. We therefore began development of a data sharing agreement between all four funding bodies. While this was in place in time for review of complaints received, it did encounter several delays before completion. For any future exercise, it is recommended that this process is started earlier, and that a draft is made available to the steering group to review and approve at their first meeting.
670. The team maintained a comprehensive retention/deletion schedule, and ensured that this was operated effectively throughout the exercise – particularly at the end, when it became necessary to delete certain personal data that were no longer required. Careful consideration was given to how to manage sensitive information, including staff circumstances data (which were special category data under Article 9 of the UK GDPR), which was deleted prior to the publication of results in line with the retention schedule. The deletion also covered the wider range of data that were not required beyond the date of publication of results, including staff names and data created by panels during the assessment.

10.4 Budget

Key points

- The direct administration cost of the REF (shared between the four UK funding bodies) was £16.7 million, reflecting a substantial underspend of around £5.8 million arising from the largely virtual format of panel meetings in the assessment year.

671. The cost of the REF is shared between the four UK funding bodies, in proportion to the scale of their respective HE sectors. Early on in the project, a preliminary budget was drawn up, using the REF 2014 budget as a starting position. The initial budget for the REF was set at £21.5 million, which was an increase of around £7 million to the final REF 2014 budget, primarily reflecting the revised the level of and approach to paying panel fees agreed at the outset of the exercise (see section 0). At this stage, the budget did not fully account for several unknowns in relation to the impact of organisational transition (for example, on greater direct staffing costs than previous exercises), and was also based on early assumptions around the number of panellists that would be appointed.

672. We provided reforecast budgets to the REF Steering Group for approval where we had a more accurate basis on which to make the forecasts, for example, following panel appointment rounds where costs could then be based on appointed numbers, or when there was greater clarity around direct and indirect staffing costs following transition to RE. These revisions saw incremental increases to the initial forecast costs. Forecasting the budget increased in complexity following the emergence of COVID-19 and consequent delay to the exercise, as we sought to repurpose savings on in-person meetings towards contingency arrangements. This included additional assessors, increased capacity for the secretariat and ensuring further contingency was built in to cover the potential increased costs of returning to in-person meetings with COVID-19-safe mitigations. In September 2020, we forecast no change in the overall budget (with savings offsetting new costs), but needed to reprofile it to incorporate FY 2022/23. However, the forecasting complexity persisted through the assessment year, as uncertainty remained about the timing, scale and cost of returning to in-person meetings.

673. At the end of the exercise, the total expenditure was £16.7 million, which reflects a substantial underspend of around £5.8 million arising from the largely virtual format of panel meetings in the assessment year. The total expenditure is a 16 per cent increase in costs in contrast to REF 2014 – a notably lower increase than originally anticipated due to the underspend.

674. The breakdown of expenditure can be seen in Table 7 below. Direct staff costs include salaries and oncosts plus agency staff; panel costs include panel fees, secretariat fees, meeting venues, travel and subsistence for panellists; other programme costs include all the remaining costs of the exercise, including the REF contribution to RE's service level agreement with the OfS.

Table 7: administrative costs of REF, by financial year and category of spend

Financial Year	Direct Staff Costs (£)	Panel Costs (£)	Other Programme Costs (£)	Total
2016/17	0	0	19,438	19,438
2017/18	263,833	135,562	349,384	748,779
2018/19	639,212	1,674,191	404,963	2,718,366
2019/20	806,721	370,908	152,874	1,330,503
2020/21	946,215	2,357,901	210,356	3,514,472
2021/22	1,009,663	5,850,319	480,050	7,340,032
2022/23*	236,845	759,115	49,191	1,045,151
Total	3,665,644	10,388,881	1,617,065	16,716,741

*2022/23 costs include period up until February 2023.



11. Concluding remarks

675. The recommendations of the Stern review of REF 2014 aimed to shape an exercise that gathered a more rounded view of research quality, gave greater recognition for the investment made in research by HEIs, and gave greater flexibility for HEIs in building submissions. The major changes we introduced in the way that staff and outputs were submitted largely delivered these aims, with the outcomes providing a picture of research quality across the breadth of university activity on a broadly comparable basis. Feedback received from institutions also suggests the new approach to staff submission helped underpin

a more inclusive and less divisive experience for individual staff than previous selective approaches had done.

676. The Stern review also aimed to reduce burden for HEIs in the submission process. The REF 2021 exercise removed the staff selection process, which had been identified as one of the most resource-intensive aspects of previous exercises. However, it is clear that some of the detailed approaches to delivering the Stern recommendations that we developed through consultation involved compromises between burden and principles including fairness and equality. For example, staff circumstances measures were retained in the exercise in response to sector concerns about the potential equality impacts of removing these – although ultimately quite mixed feedback was received from institutions on their experiences of running staff circumstances processes. A separate review of the costs incurred by participating institutions is being conducted by the funding bodies and will help identify where some of these compromises resulted in greater levels of investment by institutions than was envisaged in the initial proposals.

677. We introduced a range of additional measures in REF 2021 to strengthen EDI in the exercise and support this in research careers more widely. Our work with EDAP was critical to the introduction and review of these measures, and the panel's final report provides an evaluation of the contribution made through REF to promoting EDI⁷⁹. Reflecting on the range of measures in place for REF 2021, in its final report EDAP noted how the measures had triggered positive change and supported increased fairness and transparency in research careers. Several of these measures related to increasing the representativeness of the REF panel membership, which overall resulted in substantial progress made, but with further work still to do. Importantly, we were able to capture equalities monitoring data for both the nominations and appointments pools in this exercise, which will provide a helpful baseline for monitoring progress in future. In view of EDAP's evaluation and recommendations across the wider set of measures, there will need to be consideration and engagement around how a future exercise can best continue to promote EDI. To inform some of these considerations, EDI analyses of REF 2021 key submissions and assessment data is currently being prepared for publication and will be available later on in 2023.

⁷⁹ Available at www.ref.ac.uk, under 'Publications and reports'.

678. In the previous exercise, one of the highest environmental impacts identified with delivering REF was primarily related to panel members' travel to meetings. In contrast to over 250 panel meetings taking place across 2014, with an average attendance of 35 panellists, around 35 hybrid meetings were held across the 2021 assessment phase, sometimes with high proportions of members joining these online. The environmental impact of running the exercise for REF 2021 was therefore significantly reduced from 2014 and our own original plans for delivery, due to the widespread use of virtual meetings for the assessment phase. While there were both advantages and drawbacks to this format (as covered in section 0), the environmental benefits are clear and should be factored into decisions around the best balance of virtual and in-person assessment in future. The greater proportion of electronic outputs submitted in REF 2021 and a reduction in the central production of printed guidance materials also contributed to reduced environmental impact for this exercise; however, some of this was offset by a high volume of requests for printed copies of assessment items (including for the electronic long-form outputs).

679. Finally, it is worth reflecting on the value of continuity of experience in ensuring the lessons learned from REF 2021 can be successfully drawn upon in a future exercise. This includes continuity for the operational delivery team (which this report is substantially intended to support), the panels and the panel secretariat – while recognising the importance of balancing this with new input and contributions. Continuity of experience can be drawn upon in multiple ways, not necessarily through reappointment only, and includes early consultation and engagement with groups such as the panel secretariat around issues such as assessment system design.