Part 2A
Main Panel A criteria

Main Panel A covers the following sub-panels:

1 Clinical Medicine

2 Public Health, Health Services and Primary Care

3 Allied Health Professions, Dentistry, Nursing and Pharmacy

4 Psychology, Psychiatry and Neuroscience

5 Biological Sciences

6 Agriculture, Veterinary and Food Science

The following sections set out the criteria that Main Panel A and its sub-panels will apply in assessing submissions. This should be read alongside the guidance provided in REF 02.2011, 'Assessment framework and guidance on submissions' (hereafter 'guidance on submissions') and the generic statement of criteria and working methods provided in Part 1 of this document.

Section A1: Submissions and units of assessment

Section A2: Assessment criteria: outputs

Section A3: Assessment criteria: impact

Section A4: Assessment criteria: environment

Section A1: Submissions and units of assessment

Introduction

1. The units of assessment (UOAs) within Main Panel A's remit cover research into the practices, services, policies, education and underpinning science relevant to these disciplines, and associated methodological and theoretical advancement. The UOAs cover a full spectrum of research approaches, ranging from qualitative to quantitative, as well as theoretical and mixed method studies. This includes multi-disciplinary research and research that informs these areas from a range of stakeholders' perspectives, including research users and service users.

2. Research that has an international or developing country context can be included in submissions, where it is relevant to the UOAs.

Unit of assessment descriptors and boundaries

UOA 1: Clinical Medicine

3. The UOA includes research into all aspects of Clinical Medicine and its cognate sub-disciplines except for bodies of research more explicitly linked to UOA 2 (Public Health, Health Services and Primary Care), UOA 3 (Allied Health Professions, Dentistry, Nursing and Pharmacy), UOA 4 (Psychology, Psychiatry and Neuroscience) and UOA 5 (Biological Sciences).

4. The sub-panel expects submissions that demonstrate integrated strategies relating to all aspects of medical research. Submissions may cover the full range of research related to medicine, from basic underpinning studies through experimental medicine to clinical trials. In view of the breadth of research covered by this UOA, the sub-panel expects some degree of overlap with UOA 4 (Psychology, Psychiatry and Neuroscience) in the fields of neurology and ophthalmology, and with UOA 5 (Biological Sciences) in the area of basic biological sciences underpinning medical research.

UOA 2: Public Health, Health Services and Primary Care

5. The UOA includes research into all aspects of public health, health services and/or primary care and all their cognate disciplines. The research may be applied, theoretical or methodological research from any relevant health or healthcare discipline.

6. The sub-panel expects submissions in this UOA from all areas of public health and epidemiology (from aetiology to intervention), health services and primary care, including clinical trials, health social sciences, health policy research and health care management, and from other related disciplines having a relevance to the research covered by the UOA. It recognises the breadth and diverse range of single, multi-disciplinary and/or multi-professional research across public health, health services and primary care.

UOA 3: Allied Health Professions, Dentistry, Nursing and Pharmacy

7. The UOA includes research into all aspects of the disciplines of allied health professions, dentistry, nursing, midwifery, and pharmacy. Its boundaries include research in underpinning science, laboratory-based work, applied clinical research and research into public health, social care and health promotion. Research into psychosocial, philosophical and ethical aspects of health care, as well as education, policy and methodology relevant to these disciplines, is also included. It is anticipated that such work will use qualitative, quantitative and mixed methods, as well as theoretical approaches.

8. For allied health professions, submitted research is expected to underpin clinical practice, social care, and policy development and implementation, and includes research in biomedical and nutritional sciences, vision sciences, optometry, orthoptics, diagnostic imaging, therapeutic radiography, audiology, podiatry, occupational therapy, physiotherapy, speech and language therapy, clinical linguistics, paramedics, prosthetics/orthotics, music therapy, drama therapy, and arts therapy. For dentistry it includes research in basic and applied dental, oral and craniofacial sciences encompassing all the related clinical disciplines, primary dental care, biomaterials sciences relevant to oral and craniofacial science, and other such sciences relevant to dentistry. For nursing and midwifery it includes specialist, community and public health nursing, and all the contexts within which they operate. For pharmacy it includes all aspects of the design, synthesis, formulation, action and use of pharmaceuticals (including biological and neutraceuticals), to include medicinal chemistry, pharmaceutics, pharmacology, clinical pharmacy, underlying biomedical science, and the practice of pharmacy.

9. Submissions may cover the full translational range of research, from basic underpinning studies through to implementation research. It is expected that there will be some overlap with UOA 1 (Clinical Medicine), UOA 2 (Public Health, Health Services and Primary Care), UOA 4 (Psychology, Psychiatry and Neuroscience), UOA 5 (Biological Sciences) in the areas of biomedical sciences and pharmacology, and UOA 6 (Agriculture, Veterinary and Food Science).

UOA 4: Psychology, Psychiatry and Neuroscience

10. The UOA includes research into all aspects of psychology, neuroscience and its clinical sub-specialities, and psychiatry.

11. For psychology the sub-panel expects submissions in this UOA covering the full range of the discipline from all areas of psychology, plus all aspects of neuroscience from the molecular through to whole-system behavioural research, genetics and varieties of imaging, incorporating neurodevelopmental as well as adult work. It will include work on the understanding and treatment of all types of brain injury, stroke, neurodegenerative and neurodevelopmental disorders, as well as all aspects of psychiatry including biological, community, developmental, genetic, and neuropharmacological research.

12. The sub-panel is aware of the breadth of its remit, which will cover submissions that inform, or have the potential to inform, practice as well as submissions reporting theoretical and methodological advances in basic research. It is expected that there will be some overlap with UOA 1 (Clinical Medicine), UOA 2 (Public Health, Health Services and Primary Care), UOA 3 (Allied Health Professions, Dentistry, Nursing and Pharmacy), UOA 5 (Biological Sciences), and UOA 6 (Agriculture, Veterinary and Food Science).

UOA 5: Biological Sciences

13. The UOA includes research into all aspects of biological and biomedical sciences that encompasses the full spectrum of the basic and applied biology of all organisms, at all levels of organisation from the molecular to the ecosystem, employing a diversity of approaches including experimental, theoretical, computational and mathematical. The UOA also covers all aspects of the biomedical sciences, including biochemistry, physiology, pharmacology and anatomy at the genetic, molecular, cellular, organ system and whole-organism level. It includes work relevant to the nervous and cardiovascular systems at all levels of enquiry.

14. Submissions may include work which is on the boundaries of other UOAs in Main Panel A, such as: UOA 1 (Clinical Medicine); UOA 3 (Allied Health Professions, Dentistry, Nursing and Pharmacy); UOA 4 (Psychology, Psychiatry and Neuroscience); UOA 6 (Agriculture, Veterinary and Food Science); as well as UOAs in other main panels, such as: UOA 7 (Earth Systems and Environmental Sciences); UOA 8 (Chemistry); UOA 9 (Physics); UOA 10 (Mathematical Sciences); UOA 11 (Computer Science and Informatics); UOA 17 (Geography, Environmental Studies and Archaeology) and UOA 26 (Sport and Exercise Sciences, Leisure and Tourism).

UOA 6: Agriculture, Veterinary and Food Science

15. The UOA includes research into all aspects of agriculture, veterinary and food science, including food security, sustainability and environmental aspects, basic through to applied research, and interdisciplinary research with significant content in any of these areas of science.

16. The sub-panel expects submissions in this UOA from all areas of relevant science. For agricultural science, this includes submissions of primary relevance to the animal, plant and crop, soil, water, and atmospheric sciences that are associated with agriculture; as well as forestry, fisheries, horticulture, and related land and water use. It includes mathematical modelling and biostatistics at a range of scales, and related social sciences. It includes production systems, biotechnology, sustainability and environmental aspects, biofuels, marketing of products, water quality and use, land use, integrated pest and disease management, and waste treatment. For veterinary science this includes submissions of primary relevance to subjects underpinning the practice of veterinary medicine and surgery, and the statutory responsibilities of the veterinary profession. It includes all clinical, basic and applied aspects relevant to the normal and abnormal function of animals, their health, welfare, behaviour, productivity and diseases as individuals and populations; and their role in human society as providers of food, companions, participants in sport, models for the human condition, sources of disease, and fellow occupants of the natural environment. For food science this includes submissions of primary relevance to food science and technology (including chemistry, physics, microbiology, engineering and processing), human nutrition, diet and health, food biotechnology, food safety, packaging, sensory science, and food consumer science.

Interdisciplinary research and work on the boundaries between UOAs

17. The main panel recognises that the UOAs described above do not have firm or rigidly definable boundaries, and that aspects of research are naturally interdisciplinary or multi-disciplinary or span the boundaries between individual UOAs, whether within the main panel or across main panels.

18. The arrangements for assessing interdisciplinary research and submissions that span UOA boundaries – including through the appointment of assessors and, where necessary, cross-referring specific parts of submissions between sub-panels – are common across all main panels and are described in Part 1, paragraphs 92-100.

Pedagogic and philosophical research

19. It is expected that research on pedagogy or medical or veterinary education will be submitted in UOA 25 (Education) and research on medical ethics will be submitted in UOA 32 (Philosophy), although applied research which conforms to the UOA descriptor may be submitted in UOA 2 (Public Health, Health Services and Primary Care), and research on the philosophical and ethical aspects of health care and on education relevant to its disciplines may be submitted in UOA 3 (Allied Health Professions, Dentistry, Nursing and Pharmacy).

20. If submitted in UOAs within Main Panel A, research on pedagogy, medical or veterinary education and on medical ethics may be cross-referred to Sub-panel 25 (Education) or Sub-panel 32 (Philosophy), as appropriate.

Multiple submissions

21. 'Guidance on submissions' (paragraphs 50-52) sets out the arrangements whereby institutions may exceptionally, and only with prior permission from the REF manager, make more than one submission (multiple submissions) in the same UOA. These exceptions include situations where a sub-panel considers there is a case for multiple submissions in its UOA, given the nature of the disciplines covered.

22. Sub-panel 3 considers that there is a case, based on the nature of the disciplines covered, for multiple submissions in its UOA (Allied Health Professions, Dentistry, Nursing and Pharmacy). Such requests will be considered according to the procedures and criteria at paragraph 50d of 'guidance on submissions'. In addition, where a multiple submission in UOA 3 is granted, the sub-panel would not expect any of the same outputs or case studies to be listed in each of the submissions from the HEI.

23. Sub-panels 1, 2, 4, 5 and 6 do not consider that there is a case for multiple submissions in their UOAs, based on the nature of the disciplines covered, and do not expect to receive requests for multiple submissions in these UOAs (other than for the reasons stated at paragraphs 50a and 50c of 'guidance on submissions').

24. The main panel encourages institutions to structure their submissions using research groups, noting that there is no expectation that submissions will necessarily comprise a single coherent body of research. Where submissions are structured using research groups, the sub-panels' written qualitative feedback to institutions will highlight individual research groups of particular note. In light of this, the main panel expects single submissions to be submitted to UOAs 1, 2, 4, 5 and 6, thereby enhancing opportunities for demonstrating the connections between the diverse bodies of research within these UOAs.

Section A2: Assessment criteria: outputs

Output types

25. The main panel welcomes all forms of research output that fulfil the eligibility criteria for the REF (set out in paragraphs 105-117 of 'guidance on submissions' and in Part 1, paragraphs 43-44 of this document). In assessing research outputs, all forms of output will be considered equitably, with no distinction being made between the type of output submitted nor whether the output is made available electronically or in a physical form. Equal recognition will be given to all forms of research that meet the REF definition of research, whether basic or applied.

26. All types of output that embody research as defined in 'guidance on submissions' (Annex C), will be eligible for submission, including:

- original research findings
- research reports
- evidence synthesis, including systematic reviews, analyses, meta-analyses, metasyntheses
- review articles or text books and similar scholarly works only where they add a significant new perspective
- research-based case studies
- methodological and theoretical work
- technology appraisals.

27. Research outputs may be published in formats including, but not limited to:

- papers in peer-reviewed journals
- papers in conference proceedings
- research reports to government departments, charities, the voluntary sector, professional bodies, industry or commerce
- monographs
- books and book chapters
- intellectual property (whether granted as patents, published patent applications or other forms of intellectual property)
- other applied research outputs, including but not limited to: new materials; software packages; images and devices; research derived from development, analysis and interpretation of bio-informatic databases; work published in non-print media.

28. These are provided as examples of types of output that might be specifically relevant to Main Panel A but should not be regarded as an exhaustive list.

29. Where an output is not eligible or does not embody research as defined in 'guidance on submissions' (Annex C), it will be graded as 'unclassified'.

Outputs with significant material in common

30. As stated in 'guidance on submissions' (paragraph 108), where two or more research outputs listed against an individual in a submission include significant material in common, the sub-panels may decide to assess each output taking account of the common material only once, or judge that they should be treated as a single output if they do not contain sufficiently distinct material.

31. Where a submitted output includes significant material in common with an output published prior to 1 January 2008, as stated in Part 1 paragraph 44, submissions should explain how far the earlier work was revised to incorporate new material (maximum 100 words).

Co-authored/co-produced outputs

32. Institutions may list co-authored outputs only against individual members of staff who made a substantial research contribution to the output.

33. Paragraphs 34-37 and 42 set out the information required in submissions to UOAs 1 to 6, to establish that an individual made a substantial contribution to any co-authored outputs listed against them.

Information required about the author's contribution

34. For all sub-panels, no additional information is required in form REF2 about the author's contribution to co-authored outputs where either:

- there are fewer than six authors **or**
- there are six or more authors but the submitted member of staff against whom the output is listed is identified as either lead or corresponding author (regardless of the number of authors).

35. The main panel understands that there are a variety of publication practices by different journals and different research teams in relation to author order. Whether first author, last author, alphabetical or some other order, Main Panel A considers that the lead and corresponding authors should be easily identifiable within the submitted output. Also, the main panel recognises that the role of lead author may be shared. Provided the submitted member of staff is clearly identifiable within the output as lead or corresponding author, including any instances of where that role may be shared with other authors, no additional information is required within REF2.

36. For each submitted co-authored output where there are six or more authors **and** where the submitted member of staff is not identified as the lead or corresponding author, institutions are required to affirm the substantial contribution to the research by the submitted member of staff. This should be done by entering the following statements in REF2, deleting those elements that do not apply, but including at least one element from each of a and b:

a. The author made a substantial contribution either to the conception and design of the study; or to the organisation of the conduct of the study; or to carrying out the study (including acquisition of study data); or to analysis and interpretation of study data.

and

b. The author helped draft the output; or critique the output for important intellectual content.

37. No further text should be provided in REF2 about the author's contribution to the output. Where necessary, further information may be requested through an audit to verify that an author made a substantial contribution to the output.

Assessing co-authored outputs

38. Once the sub-panel has established that the author's contribution to a co-authored output is substantial, according to the above guidance, the sub-panel will assess the quality of the output, taking no further regard of the submitted member of staff's individual contribution. The main panel wishes to emphasise that it is the quality of the outputs that is being assessed, and that neither the order of authorship nor the number of authors will be considered important in the assessment of quality. As such, the main panel will give equal weighting to individual and collaborative/team efforts.

39. Where a sub-panel judges that the submitted member of staff has not made a substantial contribution to a co-authored output listed against that individual, the sub-panel will grade that occurrence of the output as 'unclassified'.

Listing a co-authored output multiple times within the same submission

40. Where two or more co-authors of an output are returned in **different** submissions (whether from the same HEI or different HEIs), any or all co-author(s) that made a substantial research contribution to the output may list the same output.

41. The main panel considers that the fullest and most favourable impression of research will normally be gained when each co-authored output is listed once within a submission. However, the main panel recognises that there may be very exceptional circumstances where there are substantial pieces of co-authored work, reflecting large-scale or intensive collaborative research, that institutions wish to list against more than one member of staff returned within **the same** submission. Therefore, co-authored outputs from substantial pieces of research that reflect collaboration within the institution may exceptionally be listed against a maximum of two members of staff in a submission.

42. Where a co-authored output is exceptionally listed against two members of staff returned within the same submission, this must be identified and a justification must be provided in REF2, irrespective of the number of co-authors (maximum 100 words). This should indicate the scale of the research, and describe the distinct and substantial contribution to the research of each author the output is listed against.

43. If a sub-panel does not accept the justification for listing the output twice, one occurrence of the output will be graded as 'unclassified'.

Double-weighted outputs

44. The sub-panels recognise that there may be some exceptional cases where the combined scale of academic investment in the research activity and the intellectual scope of the research output is considerably greater than the disciplinary norm, thereby limiting the capacity of an individual researcher to produce four outputs within the assessment period. Considering the patterns of publication across Main Panel A's areas of activity, the sub-panels anticipate that single-authored monographs may embody work of this nature. The sub-panels will consider requests for such outputs to be double-weighted in the assessment; in other words for it to count as two outputs in both a submission and in the calculation of the outputs sub-profile.

45. Institutions may request that a single-authored monograph is treated as double-weighted using a supporting statement to justify the claim (maximum 100 words). Sub-panels will assess the claim for double-weighting separately from assessing the quality of the output, and there is no presumption that double-weighted outputs will be assessed at the higher quality grades.

46. As the number of outputs submitted for assessment cannot sum to more than four per staff member submitted, no more than two outputs listed against an individual may be requested for double-weighting.

47. In requesting double-weighting of an output, institutions must either reduce the number of outputs listed against that individual by one per double-weighting request, or identify one output as a reserve

for each double-weighting request. Reserve outputs will be assessed only if the sub-panel does not accept the request for double-weighting. If no reserve output is included and the request for double-weighting is not accepted by a sub-panel, then the 'missing' output will be graded as 'unclassified'.

48. Sub-panels will double-weight an output only if a request is made by the submitting institution, and is accepted by the sub-panel. Sub-panels will not double-weight any output for which a request has not been made by the institution.

Additional information on outputs

Information about the research process and/or content

49. For non-text or practice-based outputs (including patents, software and standards documents), all sub-panels welcome the submission of a description in REF2 of the research process and research content, where this is not evident within the output (maximum 300 words), as described in 'guidance on submissions' (paragraph 127a).

Factual information about significance

50. The sub-panels **do not** wish to receive additional information about the significance of outputs ('guidance on submissions', paragraph 127b) and, if received, will take no account of any statement beyond those that have been requested by Main Panel A, as summarised in Annex A.

Other information

51. A summary of all the additional information about outputs required by Main Panel A is at Annex A.

Citation data

52. In accordance with 'guidance on submissions' (paragraphs 133-136), all sub-panels within Main Panel A will make use of citation data, where available and appropriate, as an indicator of academic significance to inform the assessment of output quality.

53. Where available on the Scopus citation database, the REF team will provide citation counts for submitted outputs, at a pre-determined date and in a standard format. The sub-panels will also receive discipline-specific contextual information about citation rates for each year of the assessment period to inform, if appropriate, the interpretation of citation data.

54. Citation data will inform the assessment as follows:

a. Where available and appropriate, citation data will be considered as a positive indicator of the academic significance of the research output. This will only be one element to inform peer-review judgements about the quality of the output, and will not be used as a primary tool in the assessment.

b. The sub-panels recognise that the citation count is sometimes, but not always, a reliable indicator. They are also aware that such data may not always be available, and the level of citations can vary across disciplines and across UOAs. Sub-panels will be mindful that citation data may be an unreliable indicator for some forms of output (for example, relating to applied research) and for recent outputs. Sub-panels will take due regard of the potential equalities implications of using citation data.

c. Sub-panels will use citation data only where provided by the REF team, and will not refer to any additional sources of bibliometric analysis, including journal impact factors.

Criteria and level definitions

55. This section provides a descriptive account of how the sub-panels will interpret and apply the generic criteria for assessing outputs and the starred quality levels. This descriptive account expands on and complements the generic criteria and definitions in Annex A, Table A2 of 'guidance on submissions', but does not replace them.

56. In assessing outputs, the sub-panels will look for evidence of the quality of the output in terms of its originality, significance and rigour, and will apply the generic definitions of the starred quality levels.

57. The sub-panels will look for evidence of some of the following types of characteristics of quality, as appropriate to each of the starred quality levels:

- scientific rigour and excellence, with regard to design, method, execution and analysis
- significant addition to knowledge and to the conceptual framework of the field
- potential and actual significance of the research
- the scale, challenge and logistical difficulty posed by the research
- the logical coherence of argument
- contribution to theory-building

- significance of work to advance knowledge, skills, understanding and scholarship in theory, practice, education, management and/or policy
- applicability and significance to the relevant service users and research users
- potential applicability for policy in, for example health, healthcare, public health, animal health or welfare.

58. Unless there is sufficient evidence of at least one of the above, or the definition of research used for the REF is not met, research outputs will be graded as 'unclassified'.

59. The sub-panels will use citation information, where available, as part of the indication of academic significance to inform their assessment of output quality. These arrangements are discussed at paragraphs 52-54.

Section A3: Assessment criteria: impact

Introduction

60. This section should be read alongside 'guidance on submissions' (in particular, Section 3, Annex A, Annex C and Annex G), which sets out the generic definition of impact for the REF, the requirements for submitting impact case studies and a completed impact template, the associated eligibility guidelines, and the generic assessment criteria and level definitions. The sub-panels will assess impact in accordance with this framework.

61. This section provides information which adds to and complements, but does not replace, 'guidance on submissions' with the intention of assisting institutions in developing their submissions for this new element of research assessment.

Case studies: range of impacts

62. The impact of research within Main Panel A is broad. The main panel welcomes case studies which describe impacts that have provided benefits to one or more areas of the economy, society, culture, public policy and services, health, production, environment, international development or quality of life, whether locally, regionally, nationally or internationally.

63. Impacts can be manifested in a wide variety of ways including, but not limited to: the many types of beneficiary (individuals, organisations, communities, regions and other entities); impacts on products, processes, behaviours, policies, practices; and avoidance of harm or the waste of resources.

64. Examples are provided in Table A1 as a guide to the range of potential impacts that may be eligible as case studies. The list is not exhaustive or exclusive, and does not rank examples in any way. The main panel acknowledges that within its remit impact may take many forms and occur in a wide range of spheres, and the sub-panels will consider any impact that meets the general definition of impact given in 'guidance on submissions' (Annex C).

65. HEIs are not expected to align submitted case studies specifically with the types of impact listed in Table A1, and an impact case study may describe more than one type of impact arising from a single activity, for example, a new drug can generate both health and economic impact.

66. The sub-panels expect institutions to submit their strongest case studies, regardless of the type of impact they describe. The sub-panels do not necessarily expect submissions to provide impact case studies that are a proportionate representation of the spread of research activity across the whole submitted unit. However, as part of the impact template, institutions should describe how they have sought to enable and/or facilitate the achievement of impact arising from their research, and describe the relationship between this support and the case studies submitted (see paragraph 81).

Table A1 Examples of impact[2]

Impacts on health and welfare: Impacts where the beneficiaries are individuals and groups (both human and animals) whose quality of life has been enhanced (or potential harm mitigated)	• Outcomes for patients or related groups have improved. • Public health and well-being has improved. • A new clinical or lifestyle intervention (for example, drug, diet, treatment or therapy) has been developed, trialled with patients, related or other groups (for example, prisoners, community samples), and definitive (positive or negative) outcome demonstrated. • A new diagnostic or clinical technology has been adopted. • Disease prevention or markers of health have been enhanced by research. • Animal health and welfare has been enhanced by research. • Care and educational practices have changed. • Clinical, dietary or healthcare guidelines have changed. • Healthcare training guidelines have changed. • Decisions by a health service or regulatory authority have been informed by research. • Public awareness of a health risk or benefit has been raised. • Public engagement/involvement in research has improved. • Public behaviour has changed. • The user experience has improved. • Animal health and welfare has been enhanced by research. • The control of diseases has changed.
Impacts on society, culture and creativity: Impacts where the beneficiaries are individuals, groups of individuals, organisations or communities whose knowledge, behaviours or practices have been influenced	• Public understanding has improved. • Public debate has been stimulated or informed by research. • Changes to social policy have been informed by research. • Changes to social policy have led to improved social welfare, equality or social inclusion.
Impacts on the economy: Impacts where the beneficiaries are usually the NHS, private health care, or agriculture activity.	• Policies have been introduced which have had an impact on economic growth or incentivising productivity. • The costs of treatment or healthcare have changed as a result of research-led changes in practice. • Gains in productivity have been realised as a result of research-led changes in practice. • The roles and/or incentives for health professionals and organisations have changed, resulting in improved service delivery.
Impacts on commerce: Impacts where the beneficiaries are usually companies, either new or established, or other types of organisation which undertake activity that creates wealth	• A spin-out or new business has been created and established its viability by generating revenue or profits. • Industry (including overseas industry) has invested in research and development. • The performance of an existing business has been improved. • A business or sector has adopted a new technology or process. • The strategy, operations or management practices of a business have changed. • A new product or service is in production or has been commercialised.

2 This is not an exhaustive or exclusive list, and submitted case studies may relate to more than one category.

Table A1 Examples of impact continued

	• Highly skilled people have taken up specialist roles (including academic consultancy) in companies or other organisations. • Jobs have been created or protected. • Social enterprise initiatives have been created.
Impacts on public policy and services: Impacts where the beneficiaries are usually government, public sector, and charity organisations and societies, either as a whole or groups of individuals in society, through the implementation of policies	• Policy debate has been stimulated or moved forward by research evidence. • Policy decisions or changes to legislation, regulations or guidelines have been informed by research evidence. • The implementation of a policy (for example, health, environment or agricultural policy) or the delivery of a public service has changed. • A new technology or process has been adopted. • The quality, accessibility, acceptability or cost-effectiveness of a public service has been improved. • The public has benefitted from public service improvements. • Control measures for infections have improved.
Impacts on production: Impacts where the beneficiaries are individuals (including groups of individuals) whose production has been enhanced	• Production, yields or quality have increased or level of waste has been reduced. • Decisions by regulatory authorities have been influenced by research. • Costs of production, including food, have been reduced. • Husbandry methods have changed. • Management practices in production businesses have changed.
Impacts on practitioners and services: Impacts where beneficiaries are organisations or individuals, including service users involved in the development of and delivery of professional services	• Professional standards, guidelines or training have been influenced by research. • Practitioners/professionals have used research findings in conducting their work. • The quality or efficiency of a professional service has improved. • Work force planning has been influenced by research. • Forensic methods have been influenced by research. • Educational or pedagogical practices and methods have changed outside of the submitting unit. • Law enforcement and security practices have changed.
Impacts on the environment: Impacts where the key beneficiary is the natural or built environment	• Policy debate on climate change or the environment has been influenced by research. • Environmental policy decisions have been influenced by research evidence. • Planning decisions have been informed by research. • The management or conservation of natural resources has changed. • The management of an environmental risk or hazard has changed.
Impacts on international development: Impacts where the beneficiaries are international bodies, countries, governments or communities	• International policy development has been influenced by research. • International agencies or institutions have been influenced by research. • Quality of life in a developing country has improved.

Case studies: evidence of impact

67. Each case study must include evidence appropriate to the type(s) of impact that supports the claims, including who or what has benefitted, been influenced or acted upon. Relevant indicators of the extent of the impact, in terms of its reach and significance, should also be included. Evidence and indicators may take many different forms depending on the type of impact.

68. The sub-panels within Main Panel A recommend that institutions refer to the following list of characteristics when preparing case studies:

- All the material required to make a judgment should be included – no further reading should be required.
- There should be a clear definition of who the non-academic beneficiaries were, or what had changed as a result of the research.
- The narrative should be coherent, clearly explaining the relationship between the research and the impact, and the nature of the changes or benefits arising.
- Indicators used should be meaningful, contextualised and precise in support of the case study, and the evidence should be focused and concise.
- Supporting evidence and claims should be capable of verification.
- There should be a brief explanation of what is original or distinctive about the research insights that contributed to the impact.
- The case study should include details of the names of researchers, their position in the institution, and the dates and locations of the research activity.
- Specific and appropriate independent sources of corroborating information should be supplied.
- Where the research was carried out in collaboration with other institutions, or was part of a wider body of research, this should be acknowledged and the specific input of the submitting unit's research clearly stated.
- For case studies claiming impact from public engagement:
  - There must be a clear link between the research and the engagement or involvement activity (see 'guidance on submissions' paragraph 161c).
  - Evidence should be provided about dissemination, as well as a clear explanation about the significance or the benefits to audiences.
  - The activity should go beyond 'business as usual' engagement or involvement (for example, there was active involvement of service users and/or the public, the activity informed the focus of the research or created widespread interest, was particularly innovative, or created legacy resources).

69. The list of examples in Table A2 provides a guide to potential evidence or indicators that may be most relevant to the type of impact claimed; however, it is not intended to be exhaustive or rank any indicators in any way. Some indicators may be relevant to more than one type of impact.

70. The main panel will consider any appropriate evidence that is verifiable. Wherever possible, quantitative indicators should be included. Verifiable sources for key evidence and indicators should be provided in section 5 of the impact case study template, and must be available on request. The main panel does not welcome testimonials offering individuals' opinions as evidence of impact; however, factual statements from external, non-academic organisations would be acceptable as sources to corroborate claims made in a case study.

71. The main panel recognises that some evidence in case studies may be of a confidential or sensitive nature. The arrangements for submitting and assessing case studies that include such material are set out in Part 1, paragraphs 58-59.

72. Institutions may submit case studies that describe impacts at any stage of development or maturity. However, the assessment will be solely on the impact achieved during the assessment period, regardless of the stage of maturity. No account will be taken of anticipated or future potential impact.

Table A2 Examples of evidence and indicators of impact[3]

Impacts on health and welfare	• Measures of improved clinical outcomes, public behaviour or health services (lives saved, reduced infection rates). • Measures of improved well-being. • Documented changes to clinical and public health guidelines (documented references to research evidence in guidelines). • Evidence from audit, change in guidelines. • Documented changes to animal welfare codes or guidelines. • Evidence of enhanced awareness of health risks and benefits by consumers. • Evidence of enhancement of patient experience.
Impacts on society, culture and creativity	• Documented evidence that public understanding has been enhanced through active collaborative involvement in research. • Critical reviews in the media. • Evidence of public debate. • Documented evidence of changes to social policy. • Measures of improved social equality, welfare or inclusion. • Increased public uptake of scientific training, through public engagement. • Documented shift in public attitude (for example, to sexual behaviour, or social factors in health).
Impacts on the economy	• Evidence of improved cost-effectiveness. • Evidence of service change.
Impacts on commerce	• Sales of new products/services. • Business performance measures (for example, turnover/profits, trends in key technical performance measures underlying economic performance). • Employment figures. • Licences awarded and brought to market; market authorisation. • Demonstrable collaborations with industry (including knowledge transfer partnerships, and contracts). • Commercial adoption of a new technology, process, knowledge or concept.
Impacts on public policy and services	• Documented evidence of policy debate (for example, at a parliamentary Select Committee, material produced by non-governmental organisations). • Documented evidence of changes to public policy/legislation/regulations/guidelines. • Measures of improved public services. • Documented evidence of influence on health policy and/or advisory committees. • Evidence of use of process/technology.

3 This is not an exhaustive or exclusive list. Other evidence or indicators related to the impact described may be included.

Table A2 Examples of evidence and indicators of impact continued

Impacts on production	• A new product has been recommended for use or adopted. • Development of a new plant variety or crop protection product which has entered the appropriate national or international regulatory testing system. • Published rights for animals and plants. • Evidence of improved sustainability. • Documented changes to working guidelines. • Documented evidence of improved working practices and/or level of production.
Impacts on practitioners and services	• Literature/web information from practitioners and advisers, including the research findings and how they are applied in practice. • Evidence of adoption of best practice (for example, by educators or law enforcement personnel).
Impacts on the environment	• Sales of new products, or improvements in existing products, that bring quantifiable environmental benefits. • Verifiable influence on particular projects or processes which bring environmental benefits. • Evidence of generic environmental impact across a sector, confirmed by independent authoritative evidence. • Traceable reference to inclusion of research into government policy papers, legislation and industry guidance. • Traceable reference to the influence of research in planning decision outcomes.
Impacts on international development	• Documented evidence of changes to international development policies. • Measures of improved international equality, food security, welfare or inclusion. • Evidence of take-up and use of new or improved products and processes that improve quality of life or animal welfare in developing countries.

Case studies: underpinning research

Underpinning research quality

73. Case studies must include references to one or more key research outputs produced by the submitted unit that underpinned the impact, and must provide evidence of the quality of the research. A case study will be eligible for assessment only if the sub-panel is satisfied that the underpinning research is predominantly of at least two star quality.

74. Case studies should include references to underpinning outputs that clearly demonstrate the threshold has been met. They should include additional indicators, as appropriate, of the quality of the underpinning research, for example evidence of peer-reviewed funding. The sub-panels will use the information provided in case studies, and where necessary will review outputs referenced in section 3, in order to be assured that the quality threshold has been met.

75. Provided the sub-panel is satisfied that the quality threshold has been met, the quality of the underpinning research will not be taken into consideration as part of the assessment of the reach and significance of the claimed impact.

76. Underpinning research referenced in a case study may also be included in a submission as an output (listed in REF2), without disadvantage. In these situations, the assessment of the impact case study will have no bearing on the assessment of the quality of the output. The assessment of the quality of the output may inform the assessment of the case study, only in terms of assuring the threshold for underpinning research quality.

Contribution of the underpinning research

77. The institution submitting a case study must have produced research that made a material and distinct contribution to the impact described in a case study. The sub-panels within Main Panel A recognise that several research groups or institutions may have made distinct research contributions to an impact, and they advise submitting institutions to ensure that their own critical, scientific contribution is specified clearly and that the contributions of others are acknowledged.

78. There will be many cases where a researcher has moved to a different institution during the period in which a body of research underpinning a case study was produced. Where this is the case, the submitting institution should make clear that the research undertaken during the period the researcher spent at that institution made a material and distinct contribution to the impact claimed.

Impact template

79. 'Guidance on submissions' (paragraphs 149-155) sets out the requirement to submit a completed impact template. Submitting units are required to describe how they have sought to enable and/or facilitate the achievement of impact arising from their research, and how they are shaping and adapting their plans to ensure that they continue to do so in the future. This is distinct from evidence provided in the environment template, which should describe how a unit supports the production of excellent research.

80. The main panel believes that outstanding impact can be achieved from within a wide variety of research contexts and resulting from a wide diversity of approaches, and it has no pre-formed view of the ideal context or approach.

81. The submitted impact template should include specific examples and traceable references where possible, rather than broad, general statements. The sections of the impact template should include explanation of and evidence for:

a. **Context**. Institutions should describe the main non-academic user groups, beneficiaries or audiences for the unit's research, the main types of impact specifically relevant to the unit's research, and how these relate to the range of research activity or research groups in the unit.

b. **Approach to impact**. Institutions should describe the unit's approach to interacting with non-academic users, beneficiaries or audiences and to achieving impacts from its research, during the period 2008 to 2013. This could include details of, for example:

- how staff in the unit interacted with, engaged with or developed relationships with key users, beneficiaries or audiences to develop impact from the research carried out in the unit[4]
- evidence of the nature of those relationships and interactions
- evidence of follow-through from these activities to identify resulting impacts
- how the unit specifically supported and enabled staff to achieve impact from their research

[4] Note that within the environment template, submissions should explain research collaborations with users, and how their relationships/interactions inform the development of the unit's research activity/strategy.

- how the unit made use of institutional facilities, expertise or resources in undertaking these activities
- other mechanisms deployed by the unit to support and enable impact.

c. **Strategy and plans**. Institutions should describe how the unit is developing a strategy for achieving impact, including goals and plans for supporting and enabling impact from current and future research.

d. **Relationship to the case studies**. Institutions should describe how the selected case studies relate to their approach to achieving impact. This could include details of, for example, how particular case studies exemplify aspects of the approach, or how particular case studies informed the development of the unit's approach. The main panel recognises that case studies are underpinned by research over a time frame that is longer than the assessment period, and that individual case studies may, therefore, not relate directly to the approach set out in b above.

Impact criteria

82. The sub-panels will assess impact according to the generic criteria and level definitions in 'guidance on submissions', Annex A, Table A3. The criteria will be understood as follows:

- **Reach**: the spread or breadth of influence or effect on the relevant constituencies
- **Significance**: the intensity of the influence or effect.

83. The sub-panels will make an overall judgement about the reach and significance of impacts, rather than assessing each criterion separately.

84. The criteria will be applied in the assessment of the research impact regardless of the domain to which the impact relates. Reach will not be assessed in purely geographic terms, nor in terms of absolute numbers of beneficiaries, but rather based on the spread or breadth to which the potential constituencies have been affected.

Section A4: Assessment criteria: environment

Environment template

85. Main Panel A believes that excellent research can be undertaken in a wide variety of research structures and environments. The main panel has no pre-formed view of the ideal size or organisational structure for a research environment, and will judge each submission on its merits.

86. In this context, using the information provided in the environment template (REF5) and the environment data (REF4), sub-panels will assess the vitality and sustainability of the submitting unit and its contribution to the vitality and sustainability of its discipline. The sub-panels recognise that the health of the discipline requires appropriate infrastructures and activity at HEI level to maintain and develop individuals and groups of researchers, and to train new generations of researchers.

87. Given that for the REF there is no expectation that the environment element of submissions relates to a single coherent organisational unit, submissions may define groups and their members. Groups may be departments/research groups or units which may or may not be cognate. This gives an opportunity to explicitly state how enhanced multi- and/or interdisciplinary research is being encouraged. Institutions should define their prime activities, how they operate and their main achievements. It is recognised that submissions may consist of a single group which may or may not relate to a single coherent organisational unit.

88. To facilitate the assessment of submissions, when defining groups and their members, institutions should identify groups of staff and their associated outputs (in REF1 and REF2), and use the same groupings in the environment template (REF5). The same groups should be referred to in the impact template (REF3a) where relevant.

89. Evidence and indicators for environment may include, but are not limited to, the indicators listed below under each of the section headings in the environment template (REF5):

a. **Overview**: This section should briefly describe the organisation and structure of the unit to set the context for sub-panels assessing the submission. It should be used to describe which research groups or units are covered by the submission, and how research is structured across the submitted unit. This section will be assessed in combination with the research strategy (see paragraph 94).

b. **Research strategy**: This section should provide evidence of the achievement of strategic aims for research during the assessment period; details of future strategic aims and goals for research; how these relate to the structure described above; and how they will be taken forward. Evidence and indicators may include, but are not limited to, the following:

- details of significant changes, if any, to the research environment over the assessment period
- evidence of strong research plans: a statement of the main objectives and activities in research over the next five years, including capacity building, research student recruitment, the involvement of service users, and any ongoing research work that is not producing immediately visible outcomes; balance sought between long-term and short-term research; the development of infrastructure to facilitate research; and ongoing work which is not producing immediate visible outcomes
- responsiveness to national and international priorities and initiatives
- effective mechanisms for the development, promotion and dissemination of research
- research groupings, their activities, their rationale, how they operate and their main achievements
- mechanisms and practices for promoting research, and sustaining and developing an active and vital research culture
- evidence of multi- and/or interdisciplinary developments.

c. **People**:

i. **Staffing strategy and staff development** within the submitted unit. Evidence and indicators may include, but are not limited to, the following:

- evidence of how the staffing strategy relates to the unit's research strategy and physical infrastructure
- implementation of the Concordat to Support the Career Development of Researchers
- evidence of how the submitting unit supports equalities and diversity
- effective integration of clinical academics and NHS-employed active researchers
- sustainable staff structure

- arrangements for the effective development and support of the research work of staff
- a description of how the unit has been developing the research of early career researchers and support for integrating them into a wider, supportive research culture
- research career development of both non-clinical and clinical researchers
- role of clinical researchers where relevant.

ii. **Research students**: The training and supervision of postgraduate research (PGR) students. Evidence and indicators may include, but are not limited to, the following:

- effective and sustainable doctoral research training
- evidence of a strong and integrated research student culture
- evidence of CASE awards and application of technology generated by research students.

d. **Income, infrastructure and facilities**: Information about research income, infrastructure and facilities. Evidence and indicators may include but are not limited to the following:

- the nature and quality of the research infrastructure and facilities, including significant equipment, research facilities and facilities for research students
- evidence of cross-HEI shared or collaborative use of research infrastructure
- significance of major benefits-in-kind (including, for example, donated items of equipment, sponsorships secured, or other arrangements directly related to research)
- policy and practice in relation to research governance.

e. **Collaboration and contribution to the discipline or research base**: Contributions to the wider research base, including work with other researchers outside the submitted unit whether locally, nationally or internationally; support for research collaboration; and interdisciplinary research. Evidence and indicators may include but are not limited to the following:

- indicators of wider influence or contributions to the discipline or research base
- participation in the peer-review process (for example, national and international grants committees, editorial boards)
- fellowships and relevant awards
- journal editorships
- effective academic collaboration
- extent of collaboration or integration with external bodies, such as NHS Research and Development, and/or with industry, government agencies, where appropriate
- responsiveness to national and international priorities and initiatives
- effective mechanisms to promote collaborative research, and to promote collaboration at national and international level within the academic community and/or with users of research (whether with industry or the public sector).

Environment data

90. 'Guidance on submissions' (Section 3, Part 4) sets out quantitative data relating to the research environment to be included in submissions (REF4a/b/c). Sub-panels will use the data in the context of the information provided in the environment template (REF5) to inform their assessment. Data on research doctoral degrees awarded (REF4a) will be used to inform the sub-panels' assessment in relation to 'research students' (section c.ii). Data on research income (REF4b/c) will be used to inform the sub-panels' assessment in relation to 'income, infrastructure and facilities' (section d).

91. Sub-panels within Main Panel A do not require quantitative data provided by institutions in REF4a/b/c to be reported by research group.

Environment criteria

92. The sub-panels will assess the environment according to the generic criteria and level definitions in 'guidance on submissions', Annex A, Table A4. The criteria will be understood as follows:

- **Vitality** will be considered as the extent to which a unit provides an encouraging and facilitating environment for research, has an effective strategic plan, is engaged with the national and international research community, is able to attract excellent postgraduate and postdoctoral researchers through a worldwide reputation and, where appropriate for the subject area, is supported by a portfolio of research funding.

- **Sustainability** will be understood as a coherent vision for the future, and investment in people and in infrastructure.

93. In assessing the environment element of submissions, panels will apply the criteria in terms of both the research environment within the submitting unit, and its participation in and contribution to the academic discipline and community of relevance to the UOA.

94. In forming the environment sub-profiles, the sub-panels will combine 'overview' and 'research strategy', and will assess the environment template sections as four components of equal weighting, (taking account of the environment data as stated in paragraph 90):

- overview and research strategy
- people (staffing strategy and staff development; and research students)
- income, infrastructure and facilities
- collaboration and contribution to the discipline or research base.