University of Sheffield | Sheffield Centre for Health & Related Research

British Society of Gerontology

The Impact of Ageing Research within the Research Excellence Framework 2021: an evaluation

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Prepared for: British Society of Gerontology

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Table of Contents

Executive Summary **4**

Acknowledgements **6**

1.Introduction **7**

2.What is research impact in the REF? **8**
2.1 Impact and the REF *8*
2.2 Limitations of the REF dataset *9*

3.Outline of consultancy tasks **10**
3.1 Evaluation aims and objectives *10*
3.2 Methodology *10*
3.3 A few caveats to the analysis *11*

4.Findings: identifying case studies related to ageing and later life **13**
4.1 Phase 1: keyword examination of the dataset *13*
4.2 Findings from the screening of case studies *14*
4.3 Impact categories *17*

5 Findings: Summary analysis of a sample of impact case studies **20**
Impact case study *22*
Overview of impact *22*
Main routes/mechanisms associated with the impact *22*
5.2 Impact case studies by Panel *47*
5.3 Impact categories in the sample *47*
5.4 Breakdown by Panel and Unit of Assessment *48*
5.3 Centres/Groups involved in the case study *48*
5.4 Is there evidence of collaborative work – other higher education institutions, organisations? *49*
5.5 Who are the main research funders? *49*
5.6 What is the indicative timescale between research and impact? *50*
5.7 How many research studies are presented? *51*
5.8 Is the research based on the work of a team or an individual? *52*
5.9 Do the case studies show international reach? *52*
5.10 What subject areas are represented? *52*
5.11 Is there evidence of participation and engagement with older people? *54*
5.12 What routes/mechanisms have been used to achieve impact? *55*

6.Discussion **57**

7.Conclusion **60**

7.References **61**

8 Appendices **65**
Appendix A: Key words used *66*
Appendix B: Search by centres/ groups *69*
Appendix C: Key word search by combination of terms *72*
Appendix D: Proforma for case study analysis REF 2021 *73*
Appendix E: List of case studies included in the sample analysis *75*

List of Tables and Charts

Table A: REF 2021 Screening of 3096 ageing research case studies 15
Table B: Findings obtained from REF 2014 Screening of 763 ageing research case studies 15
Table C: Breakdown of ageing research case studies submitted to REF 2021 by unit of assessment 15
Table D: REF 2021 breakdown of impact categories for 572 ageing research case studies 18
Table E: REF 2014 breakdown of impact categories for 311 ageing research case studies 19
Table F: REF 2021 Sample size by Panel 21
Table G: REF 2021 an overview of the sample of 25 impact case studies 22
Table H: REF 2021 breakdown of the case studies by Panel and Unit of Assessment 48
Table I: REF 2021 number of research studies in the case study 52
Table J: REF 2021 case studies by teams and individuals 52
Table K: REF 2021 subject areas represented 53
Table L: REF 2021 breakdown of research subject areas by Panel 53

Chart A: Breakdown of ageing research case studies by unit of assessment 17
Chart B: Chart to show breakdown of impact categories for 572 ageing research case studies 18
Chart C: REF 2021 breakdown of case studies by Panel 47
Chart D: REF 2021 breakdown of the impact categories in the sample. 47
Chart E: REF 2021 information about the range of funders in the sample case studies. 50
Chart F: REF 2021 breakdown of the indicative timescales between the start of the research and the impact commencing 51

Executive Summary

This evaluation extends the analysis previously undertaken by the Sheffield Centre for Health and Related Research and commissioned by the British Society of Gerontology (BSG), which examined the impact of research about ageing and later life across the REF 2014. The aims and objectives for the evaluation were as follows:

Aim
To consider the content, significance and reach of research concerning ageing outlined in the Research Excellence Framework (REF) 2021 impact case studies.

Objectives
1. To determine the spread of impact case studies concerned with ageing and later life.
2. To analyse how impact has been addressed within a sub-sample of case studies.
3. To consider the role of social gerontology in the creation of impact out of interdisciplinary and/or cross-sector research.
4. To consider how this analysis may be of value to members of the BSG and others involved in research about ageing and later life.

The evaluation design adopted a manual content analysis of the REF 2021 database of impact case studies related to ageing and later life. It consisted of a keyword search of the database to identify relevant impact case studies, followed by an in-depth analysis of a purposive sample of 25 impact case studies using an agreed proforma. Due to changes made in the methodology for the REF 2021 analysis it was not possible to meaningfully compare the data from this analysis with the REF 2014 analysis and in particular any increase or decrease in the number of case studies identified. Instead, we comment upon broad patterns and similarities with the REF 2014 and REF 2021 analyses.

The keyword examination reveals:

A total of 572 impact case studies related to ageing and later life were identified. This represents 8.4% of 6,781 impact case studies submitted overall to REF 2021. For the REF 2014 analysis, there were 311 impact case studies which represented 4.7% of the total 6,679 published impact case studies.

A striking feature was that all of the Panels and 33 out of 34 Units of Assessment included ageing related impact case studies. In common with REF 2014 there was considerable **disciplinary breadth**. The range of Panels and Units of Assessment which featured research illuminating some aspects of age, ageing and later life is impressive.

The distribution of case studies across the Panels shows that ageing related impact case studies were predominantly identified in Panel A (life sciences and health) forming 48% (272 out of 572) impact case studies.

Ageing research impact embraces a broad and diverse spectrum. **'Health' and 'Societal'** were the two most commonly occurring categories of impact in the REF 2021 analysis with

'health' occurring in 40% of the case studies and 'societal' occurring in 37% of the case studies.

An examination of a sample of 25 impact case studies highlights:

Impact is underpinned by **collaborative and partnership activities** with a wide range of stakeholders. The role of organisations and agencies concerned with older people is pivotal in realising research impact.

An **extensive range of funders** supported the underpinning research.

Involvement with older people is a key part of research practice with over half (52%) of the sample case studies making explicit reference to the participation and engagement with older people. There are examples of innovative practice, user-centred design, co-design of research and interventions, participatory performances, creation of cultural artefacts, international collaborations, and experiences of marginalised groups.

Over three-quarters (76%) of the sample of impact case studies refer to an **international dimension** to the research.

As noted in the REF 2021 Panel Reports, there are examples of impact case studies contributing to the work on Covid-19. This highlights the value of research evidence and the speed with which relevant evidence can be adopted. Within the sample of impact case studies 20% (5 out of 25) made reference to Covid-19 in terms of policy and/or intervention development.

Despite the limitations of using the REF database of case studies, the analysis described in this report highlights the **multi- and inter-disciplinary strength** of ageing research. This provides a useful springboard for the British Society of Gerontology to continue to build on these strengths and to encourage, maintain and grow capacity.

Acknowledgements

The project team would like to thank members of the British Society of Gerontology (BSG) Advisory Group, Gary Christopher, Carol Holland, David Lain and Alisoun Milne for their constructive guidance and dialogue throughout this project. We would also like to extend our thanks to the BSG Executive Committee for their oversight and guidance in the undertaking of this project.

In addition, this project would not have been possible without the freely available searchable online database of the Research Excellence Framework (REF) 2021 impact case studies. The REF 2021 impact case studies are published under a Creative Commons by 4.0 International License which enables sharing and use within the license (1).

1.Introduction

The British Society of Gerontology (BSG) commissioned a consultancy project to understand the profile of ageing research submitted as part of the Research Excellence Framework (REF) 2021.

The consultancy project was conducted between February 2023 and October 2023. It was conducted by Surinder Bangar (SB), Sarah Hargreaves (SH) and Gail Mountain (GM) at the University of Sheffield working in collaboration with the BSG Project Advisory Group consisting of Gary Christopher, Carol Holland, David Lain and Alisoun Milne.

This report includes a background to REF and impact, an outline of the consultancy tasks undertaken, and an overview of the findings, together with concluding recommendations for the BSG.

The findings were presented as part of the 'Healthy Ageing Challenge' national conference event in November 2023. Dissemination plans include a journal article and a blog post for the BSG 'Ageing Issues'.

2.What is research impact in the REF?

The REF is a peer assessment of the quality of UK universities' research in all disciplines. The REF was undertaken by the four higher education funding bodies: Research England, Scottish Funding Council, Higher Education Funding Council for Wales and the Department for the Economy, Northern Ireland who use the REF results to distribute research funding to universities based on research quality. The submissions are assessed by panels of experts who produce an overall quality profile for each submission (2).

REF 2014 introduced for the first time an assessment of the wider impact of research, alongside an assessment of the quality of research outputs and the vitality of the research environment (2).

In REF 2021, 157 UK institutions made submissions in 34 subject-based Units of Assessment (UoA) (3). The overall quality profile awarded to each submission was based on these elements, weighted as follows:

Outputs:	60%
Impact:	25%
Environment:	15%

The results of REF 2021 were published on 12 May 2022 (4).

2.1 Impact and the REF

The impact dimension is assessed through the submission of impact case studies for each UoA. There is a minimum requirement for each submitting university to provide two impact case studies for each UoA. The overall number of case studies submitted is determined by the number of full-time equivalent staff returned by the submitting institution (5).

For the purposes of REF, impact is defined as:

'any effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia.'

For REF 2021 the timescale for demonstrating when the impact occurred was specified as being between 1 August 2013 to 31 December 2020, underpinned by research conducted between 1 January 2000 and 31 December 2020.

Case studies were assessed on their 'reach' and 'significance':

- Reach – 'the spread or breadth of influence or effect on the relevant constituencies' and
- Significance – 'the intensity or the influence or effort.'

An impact case study submitted for REF 2021 had to be a five-page document describing the impact of research beyond academia. This document followed a prescribed template which

included information about the submitting institution and unit of assessment. It was comprised of the following:

- Title of the case study
- Summary of the impact (indicative 100 words)
- A description of the underpinning research (indicative 500 words)
- References to the research (indicative maximum of 6 references)
- Details of the impact (indicative 750 words)
- Sources to corroborate the impact (indicative maximum of 10 references)

Overall, 6,781 impact case studies were submitted to REF 2021. An online searchable database of the submitted impact case studies was published on 24 June 2022. The database consists of 6,361 non-redacted case studies (as of 22 June 2022). The REF 2021 online database of case studies is available at: https://results2021.ref.ac.uk/impact (4).

The REF database categorises each impact case study by type of impact. It is an indicative guide to aid text searching.

Information about REF impact types used in the database

In line with REF 2014, there are eight 'Summary Impact Types'. These are categorised as: Cultural, Health, Economic, Environmental, Legal, Political, Societal and Technological.

The REF database assigns a single impact category to each case study to aid searching and is not intended to be a definitive overview of the impact described in the case study. As noted on the database most impact case studies would relate at some level to more than one type of impact (6).

2.2 Limitations of the REF dataset

There are some limitations to the REF dataset of impact case studies. It is constrained by the REF definition of impact and the specific rules and requirements such as when the impact and the underpinning research had to occur. Also, content will have been driven by institutional decisions to submit examples of what might place the university in the most advantageous position from a research assessment perspective (7).

In addition, the King's College London/Digital Science analysis of the impact case studies from REF 2014 notes that the impact case studies submitted to the previous assessment were limited by the way that impact was required to be articulated and described, they are selective and, although this resulted in an extensive set, they were not necessarily representative of impact case studies across the sector (8).

Notwithstanding these limitations the database of impact case studies initially generated from the REF 2014 submissions has been acknowledged as an invaluable and tremendous resource showcasing research impact and used for analysis purposes (8).

3.Outline of consultancy tasks

This evaluation extends the analysis previously undertaken by the Sheffield Centre for Health and Related Research (SCHARR) (previously known as the School of Health and Related Research) and commissioned by BSG, which examined the impact of research about ageing and later life across the REF 2014 (7). The publication of the REF 2021 database of impact case studies provided an opportunity to examine research about ageing across the new submissions and identify the changes and similarities that have occurred since 2014.

3.1 Evaluation aims and objectives

To ensure some continuity and consistency with the REF 2014 analysis, the aims and objectives for the evaluation were as follows:

Aim
To consider the content, significance and reach of research concerning ageing outlined in the REF 2021 impact case studies.

Objectives
1.To determine the spread of impact case studies concerned with ageing and later life.
2.To analyse how impact has been addressed within a sub-sample of case studies.
3. To consider the role of social gerontology in the creation of impact out of interdisciplinary and/or cross-sector research.
4.To consider how this analysis may be of value to members of the BSG and others involved in research about ageing and later life.

3.2 Methodology

The evaluation design adopted a manual content analysis of the REF 2021 database of impact case studies related to ageing and later life.

A BSG Project Advisory Group was established to oversee the progress of the analysis and to provide feedback as required. This included but was not limited to agreeing the proforma to be used, participation in some impact case study analyses and agreeing the content of the analysis reports during the drafting stages and to acting as the link for reporting on the analysis at national level.

How the methodology differs from the REF 2014 analysis

We built upon the methodology used in the REF 2014 BSG impact analysis. Whilst the overall design of the evaluation was broadly similar, we made two significant changes. Firstly, for the keyword search of the dataset, we adopted a more expansive approach and included a greater number of terms and combination of terms. In part this is due to database developments and a desire to include different terms which have been introduced over time. Secondly, for the sampling methodology we adopted purposive sampling for an in-depth analysis of a sub-set of impact case studies. This change was made to enable us to select case studies to illuminate aspects of ageing and later life, and to draw upon case studies which would encompass the richness and variety across the case studies. Previously

in REF 2014, whilst we considered a greater number of case studies they were randomly selected. Changes made for this analysis enabled us to enhance and build upon the previous evaluation learning from its strengths and limitations.

Phase 1: Quantitative data: keyword examination of dataset

Quantitative data were collected and analysed through keyword searching of the REF database. Screening of identified case studies was conducted to ensure that they were concerned with ageing and later life.

The keyword searches guided identification of case studies. This was supplemented by screening of each Panel using case study titles, impact summaries and description of impact to determine whether each identified case study was related to ageing research.

Analysis of this quantitative data identified the number of impact case studies concerned with ageing and later life and the Panels and UoAs that these were submitted to.

Phase 2: Qualitative data

Qualitative data analysis of impact case studies was conducted using an agreed proforma. We updated the proforma used within the BSG REF 2014 analysis in collaboration with the BSG Project Advisory Group. The proforma was designed to collect and collate data regarding the content, breadth, and influence of the impact of each identified case study. Guidance for completion was provided to ensure that analyses conducted by different individuals was consistent.

A purposive sample of 25 impact case studies for in-depth analysis was agreed with the BSG Project Advisory Group.

Dissemination

Dissemination plans include a journal article, and a blog post for the BSG 'Ageing Issues'. Once this report has been adopted by the BSG, we will produce a journal article, for example for '*Ageing and Society*'. The journal article will be written in collaboration with the BSG Project Advisory Group. The findings were presented at a national conference event in November 2023.

3.3 A few caveats to the analysis

The analysis is based upon the impact case studies submitted to the REF and specifically draws upon the 6,361 non-redacted case studies available on the online database.

This analysis does not assess the quality of the impact; those decisions have already been made by panels of experts as part of REF. The analysis is based on collation of an overview of a sample of case studies submitted as ageing research. These may not necessarily reflect actual impact being generated by institutions, for example, potential impact case studies may not have been submitted where there was uncertainty about their eligibility or where it might have been more challenging to demonstrate impact.

Ageing research and the ways in which research potentially benefits the lives of older people is broad and diverse. Ageing research is also organic and developing. For example,

there were discussions about the use of language and terminology to describe age and ageing during BSG Advisory Group meetings. Judgments had to be made about which case studies to include as part of the profile of ageing research for this consultancy project. We appreciate that such interpretations will differ.

In addition, the report is based on secondary data analysis of impact case studies only and not upon discussion with case study authors which would have enriched understanding of the case study content and context (7).

4.Findings: identifying case studies related to ageing and later life

The initial starting point was to identify ageing research impact case studies from the REF 2021 database.

The REF 2021 online database contains: 6,361 case studies.
The total number of impact case studies submitted to REF was: 6,781.
The number of case studies not submitted to the online database was: 420 (redacted case studies).

An examination of the database using a series of keywords identified the following.

4.1 Phase 1: keyword examination of the dataset

Developments introduced to the REF 2021 database included the use of truncation for searching and we applied this to the keyword search. In addition, whilst for the REF 2014 analysis it was agreed to exclude terms which were broader in scope (for example, 'old', 'hospital'), for this analysis it was agreed to adopt an expansive approach. All keywords suggested by the BSG Advisory Group and project team members were included. Limiters were used with search terms which were broader in scope, such as, 'hospital', 'old' and 'senior'. The list of Ageing Research Centres listed on the BSG website and other Centres/Groups specialising in ageing research were also included. The list of centres and groups indicates a small number of case studies or none by each centre. It is likely that most if not all centres and groups are cross-faculty and therefore impact case studies would be submitted by the author's own department and not by the centre.

Appendix A includes the keywords tested in the REF 2014 analysis and the additional keywords introduced for this project. *Appendix B* shows the keyword search by centres/groups.

To ensure that the search was comprehensive and to potentially remove any duplicates the next stage involved combining keywords. We combined as many as possible in a single search and added other terms separately.

Appendix C shows the keyword search by combination of terms. All database searches were repeated at least twice and took place on 13/14 March 2023.

The process of combining the search terms gave a total of: 5144 records.
After removing duplicates there were: 3096 records to screen to assess that they related to ageing and later life.

The search was extensive and comprehensive (consisting of over 80 keyword searches and searches of the work of 36 Centres/Groups). Using this method, we are confident that impact case studies related to research about ageing and later life have been included in the identified set of 3,096 records.

Managing the screening of records

For the REF 2014 analysis, we had 763 records to filter. The expansive approach adopted for this analysis led to an extensive volume of records to review for eligibility. 3,096 records from a total of 6,361 in the REF 2021 dataset (with 6,781 submitted overall).

Screening of impact case studies identified through the keyword search

Whilst the breakdown shown in Table A provides an initial indication of the extent of ageing research submitted to each Panel, an inspection of each record was necessary to ensure that each case study did actually relate to ageing and later life.

We scrutinized all 3,096 case studies predominantly by title and summary information, though in some cases we considered other sections of the case study to make an informed judgment.

We undertook an initial pilot to refine the criteria for inclusion and categorised each case study as:

- Yes - to include.
- Indirect benefit.
- No - not related to ageing.
- Unclear – where it is not possible to determine if the case study relates to research about ageing and later life without undertaking wider reading (for example of references included).

The case studies for inclusion are based upon:

- Research that is specifically about ageing or older people.
- Research to benefit the lives of older people.
- Experience of ageing.
- Research which mentions older people as the potential focus of the research and/or beneficiaries of research.

Others that did not fit into the above were categorised as being of:

- 'Indirect benefit', for example where the benefits are more general for the public/wider population and not specifically focused on older people.
- Or 'not relevant', for example the keywords search included some which related to pregnancy, children.

Interpretations about which case studies to include and not include and any areas of uncertainty were discussed by SB and SH based upon the criteria for selection prior to sampling taking place.

4.2 Findings from the screening of case studies

This screening exercise produced the following:

Table A: REF 2021 Screening of 3096 ageing research case studies

	Panel A	Panel B	Panel C	Panel D	Totals
Keyword search	830	490	915	861	**3096**
Directly relevant	**272 (48%)**	**59 (10%)**	**107 (19%)**	**134 (23%)**	**572**
Indirectly relevant	56	66	56	99	**277**
Not relevant	502	365	752	628	**2247**
Continuing case studies	12	7	6	0	**25**

Panel A: life sciences and health; Panel B: engineering and physical sciences; Panel C: social sciences; Panel D: arts and humanities.

Overall, the number of impact case studies we identified as being directly relevant was: 572. This represents 8.4% of the 6,781 case studies submitted overall to REF 2021. For illustrative purposes, the numbers of case studies identified in the REF 2014 analysis are provided in Table B.

Table B: Findings obtained from REF 2014 Screening of 763 ageing research case studies

	Panel A	Panel B	Panel C	Panel D	Totals
Keyword search	248	116	248	151	**763**
Directly relevant	**154 (50%)**	**41 (13%)**	**56 (18%)**	**60 (19%)**	**311**
Indirectly relevant	31	28	93	11	**163**
Not relevant	63	47	101	80	**291**

The identified 572 case studies submitted to REF 2021 across the Panels and Units of Assessment is as follows.

Table C: Breakdown of ageing research case studies submitted to REF 2021 by unit of assessment

	Unit of Assessment	Total
Panel A: Life Sciences		
1	Clinical Medicine	59
2	Public Health, Health Services and Primary Care	41
3	Allied Health Professions, Dentistry, Nursing and Pharmacy	122
4	Psychology, Psychiatry and Neuroscience	43
5	Biological Sciences	6
6	Agriculture, Food and Veterinary Sciences	1
Panel B: Engineering and Physical Sciences		
7	Earth Systems and Environmental Sciences	0
8	Chemistry	6
9	Physics	3
10	Mathematical Sciences	10
11	Computer Science and Informatics	21

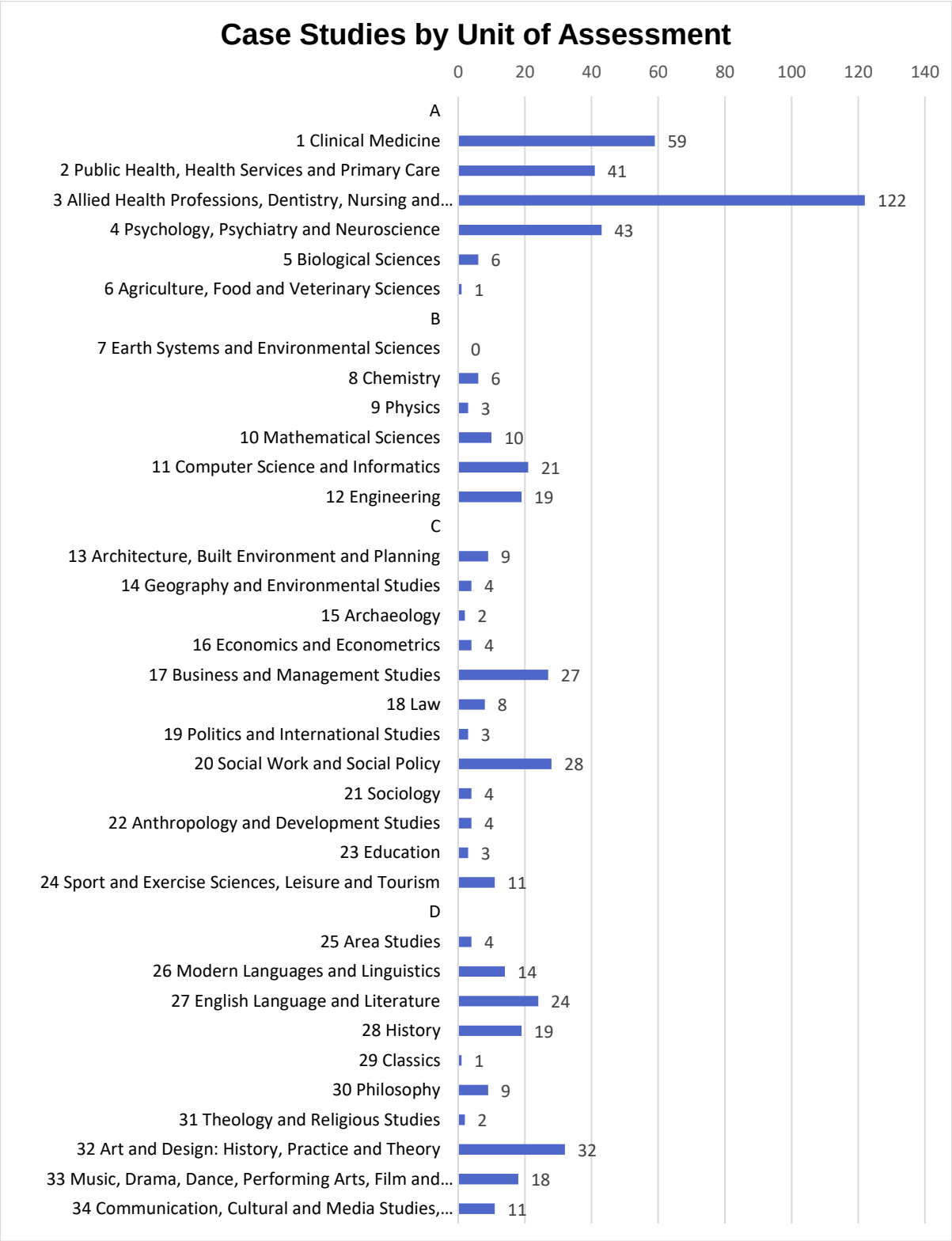
12	Engineering	19
Panel C: Social Sciences		
13	Architecture, Built Environment and Planning	9
14	Geography and Environmental Studies	4
15	Archaeology	2
16	Economics and Econometrics	4
17	Business and Management Studies	27
18	Law	8
19	Politics and International Studies	3
20	Social Work and Social Policy	28
21	Sociology	4
22	Anthropology and Development Studies	4
23	Education	3
24	Sport and Exercise Sciences, Leisure and Tourism	11
Panel D: Arts and Humanities		
25	Area Studies	4
26	Modern Languages and Linguistics	14
27	English Language and Literature	24
28	History	19
29	Classics	1
30	Philosophy	9
31	Theology and Religious Studies	2
32	Art and Design: History, Practice and Theory	32
33	Music, Drama, Dance, Performing Arts, Film and Screen Studies	18
34	Communication, Cultural and Media Studies, Library and Information Management	11
	Grand Total	572

Table C shows that ageing related impact case studies appear in 33 out of 34 Units of Assessment. REF 2021 instituted a reduction in the number of units of assessment from 36 to 34 and whilst it is not possible to directly compare with the REF 2014 analysis (which showed that ageing related case studies appeared in 33 out of 36), the findings provide some indication of the wide variety of subject disciplines undertaking research which relates to ageing.

This represents a broad spectrum across the REF subject disciplines, mirroring the findings from the REF 2014 analysis.

The data in Table C is also shown in Chart A to show the breakdown of ageing research impact case studies by Unit of Assessment for illustrative purposes.

Chart A: Breakdown of ageing research case studies by unit of assessment



4.3 Impact categories

The REF database categorises each impact case study by type of impact. It is an indicative guide to aid text searching.

There are eight summary impact types:

Political	*Legal*
Economic	*Environmental*
Societal	*Cultural*
Technological	*Health*

The breakdown of impact categories for the case studies is as follows:

Chart B: Chart to show breakdown of impact categories for 572 ageing research case studies

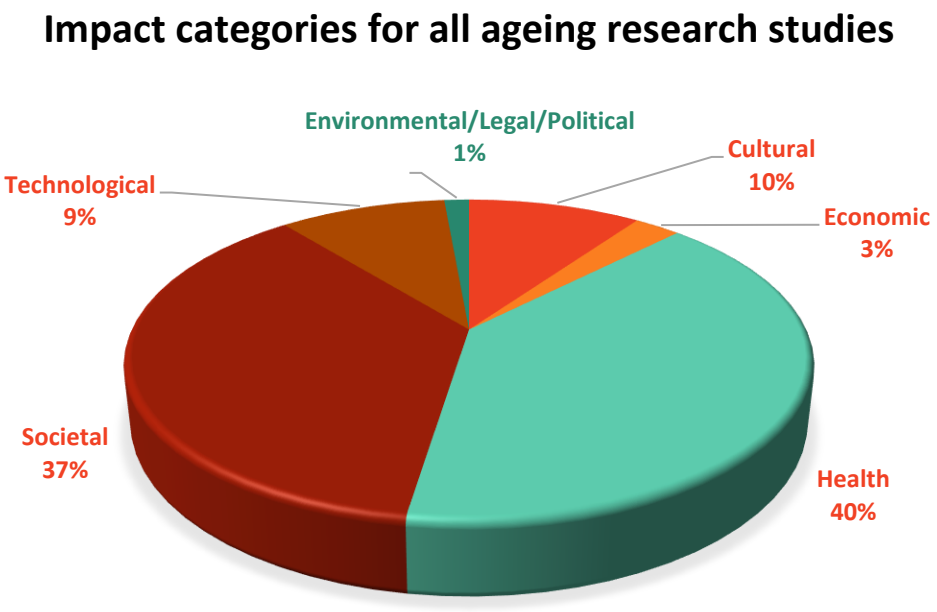


Table D provides a breakdown by the numbers of case studies for the impact categories.

Table D: REF 2021 breakdown of impact categories for 572 ageing research case studies

Impact categories	Panel A	Panel B	Panel C	Panel D	Total	%
Political	1		1		2	0.35
Economic	0	3	11	1	15	2.62
Societal	56	12	66	76	210	36.71
Technological	23	27	3	1	54	9.44
Legal	1		2		3	0.52
Environmental	1		2		3	0.52
Cultural	1	1	2	52	56	9.79
Health	189	16	20	4	229	40.03
Total	**272**	**59**	**107**	134	572	100

All eight of the impact categories were present in the data.

For illustrative purposes, Table E provides a breakdown of the impact categories assigned in the REF 2014 analysis.

Table E: REF 2014 breakdown of impact categories for 311 ageing research case studies

Impact categories	Panel A	Panel B	Panel C	Panel D	Total	%
Cultural	0	0	0	23	**23**	**7.42%**
Economic	2	4	6	0	**12**	**3.87%**
Health	86	8	3	8	**105**	**33.87%**
Legal	1	0	0	1	**2**	**0.65%**
Political	12	1	13	2	**28**	**9.00%**
Societal	24	5	34	23	**85**	**27.74%**
Technological	29	23	0	3	**55**	**17.74%**
Total	**154**	**41**	**56**	**60**	**311**	

There are differences in the impact categories from REF 2014. For example, the gap between case studies categorised as 'Health' and 'Societal' has narrowed in the REF 2021 analysis than in REF 2014. Previously, 'Health' formed 34% (105 out of 311) of case studies and 'Societal' 28% (85 out of 311) with a 6% difference. In REF 2021, it is now closer with a 3% difference ('Health', 40% (229 out of 572) and 'Societal', 37% (210 out of 572)). Those classified as 'Technological' formed 18% in REF 2014 whereas in REF 2021 they form 9%. However it should be noted that the categories are an indicative guide only, with many case studies demonstrating impact in more than one broad category. In addition, the expansion of the keyword search terms used in the REF 2021 analysis means that the value of making direct comparisons is limited.

5 Findings: Summary analysis of a sample of impact case studies

Research
Older
People
Care
Nations
Health
Life
Improve
Social
Work
Age
Home
Words
Uk
Policy
Art
Informs
Benefit
Design
Public
Led
Use
Risk
Through
Universal
Base
Nhs
Gbp
Live
Develop
Service
Impact
Include
Practice
New
Increased
Indicative
Between
Maximum
Government
Model
Intervention
Support
Shape
Provides
Influence
Evidence
Challenge
Women
Plan
Lead
Sup
Over
Work
Engage
Collaboration
Individual
Within
Enable
Generate
Benefit
Patient
Clinical
Provision
Practice
Result
People
Shape
Base
Policy
Local
Model
Plan
Life
Nhs
Age
Uk
Home
Live
Challenge
Evidence
Women
Impact
Include
Develop
Service
Increased
Clinical
Patient
Practice
Provision
Research
Insights
Social
Impact
Older
Improve
Programme
Provision
Design
Both
Between
Indicative
Result
Engage
Policy
Base
Use
Led
Over
Work
Sup
Local
Gbp
Uk
Life
Between
Maximum
Government
Model
Intervention
Maximum
Work
Support
Shape
Universal
Through
Person
Risk
Use
Change
Gbp
Live
Public
Sup
Collaboration
Local
Plan
Work
Uk
Home
Lead
Life
Nhs
Age
Benefit
Generate
Uk
Service
Challenge
Evidence
Women
Impact
Plan
Include
Develop
Live
Practice
Patient
Clinical

Considerations for the sampling

The purposive sample of 25 case studies was intended to:

- Highlight the contribution of social sciences to science-based impact case studies or panels;
- include examples from panels where it would be surprising to find any impact case studies related to ageing research;
- include examples of case studies continued from REF 2014;
- showcase and illustrate the richness, diversity, and breadth of ageing research.

The sample of 25 specifically included case studies which appeared to focus upon older people i.e. those specifically about older people or where older people were the beneficiaries.

The above factors were then considered for each Panel and then across the Panels. Unfortunately the capacity of the research team and the BSG Advisory Group meant that the number of selected studies had to be capped at 25.

Sampling of case studies for analysis

The proposed sample size by Panel was based upon the approach taken for the BSG REF 2014 analysis. The intention was to highlight the contribution of the social sciences within research about ageing and later life and therefore a greater number from Panel C were identified for detailed analysis.

The proforma was firstly piloted with 6 impact case studies by SB and SH. Following this the remaining impact case studies from the sample of 25 were analysed using the proforma. Members of the BSG Advisory Group and GM were involved with completing proformas for two impact case studies each with SB and SH completing the remaining proformas. Guidance for completion and examples were provided. To ensure consistency, SB reviewed all completed proformas and discussed any queries with SH.

Table F: REF 2021 Sample size by Panel

	Panel A	Panel B	Panel C	Panel D	Totals
Keyword search	830	490	915	861	**3096**
Directly relevant	**272**	**59**	**107**	**134**	**572**
Sample size	7	3	10	5	**25**

Table G below details the sample of 25 impact case studies and includes key information about the case study, an overview of the impact, the participation and engagement of older people and routes/mechanisms associated with achieving impact.

To reflect ongoing impact, one of the case studies selected is a continuing impact case study submitted by the University of Manchester, 'Falls prevention amongst older people: Increased reach and further impact of interventions, uptake and adherence'. This provides an opportunity to explore on-going impacts and any new impacts arising over an extended period.

Table G: REF 2021 an overview of the sample of 25 impact case studies

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Shaping national policy to reduce the rate of COVID-19 transmission in care homes (9) University College London **Panel A:** Public Health, Health Services and Primary Care **Funders:** UK Research and Innovation, Public Health England, Economic and Social Research Council (ESRC). **Collaborations:** Primary and secondary health providers; social researchers at the University of Leicester; designers at the Helen Hamlyn Centre for Inclusive Design; and one of the UK's largest care home chains, Four Seasons Healthcare. **Location:** UK **Research methods:** systematic review; retrospective cohort study of linked data; mixed methods cohort study using active surveillance and electronic records; national cross-sectional survey. **Participation/engagement with older people:** indicates residents were involved as research participants with no involvement beyond this described.	The research informed national policy relating to COVID-19 in care homes. Evidence from the studies is deployed in key reports relating to COVID and care homes, for example the Social Care Sector Taskforce's report and the Social Care COVID-19 Winter Plan. Evidence directly changed policy decisions relating to care homes, for example the frequency of care home testing and strategies to reduce the spread of infection e.g. reducing staff movement between care homes. Evidence was used to support the establishment of the Infection Control Fund to facilitate this (subsequently extended as part of the Winter Care Plan to March 2021). The work also contributed to improved data gathering and reporting mechanisms around ongoing COVID-19 testing in care homes. The team developed a 'dashboard' to monitor infection rates and patterns across the care home sector including factors associated with outbreaks and mortality. These data were shared with, and informed decisions made by, local directors of public health and the Adult Social Care Team at the Department of Health and Social Care (DHSC). These insights also directly informed vaccination policy and shaped the recommendations of the Joint Committee on Vaccination and Immunisation in Dec 2020 to prioritise the vaccination of care home residents and staff. The research is widely recognised as having saved many hundreds of lives in the care home sector.	1)**Engagement with policymakers:** the team (led by Shallcross) have engaged directly with policy makers and leaders relating to the COVID-19 pandemic via a number of policy related committees e.g. SAGE Social Care Working Group, DHSC and 10 Downing St. Key decision makers attended these meetings. Engagement included a number of presentations of study findings at meetings. 2)**Influencing policy:** Shallcross was invited to work with NHS England, the Office of National Statistics and the DHSC to set up the VIVALDI-1 study so it is reasonable to assume her work was impactful for these organisations (directly and via meetings). The Chair of the UK Government Social Care Sector COVID-19 Support Taskforce was directly influenced by the research findings. Sir Patrick Vallance, the UK Govt Chief Scientific Advisor, was similarly influenced. 3) **Undertook collaborative research**: including health and care providers, social researchers, designers and a care home chain.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Enhancing older people's accessibility and activity in unfamiliar places through age-friendly planning (10) Kingston University **Panel B:** Engineering **Funders:** Joint Research Councils UK New Dynamics of Ageing Programme (NDA). **Collaborations**: The Kingston team worked with colleagues from Swansea, Middlesex and Anglia Ruskin Universities. **Location**: UK **Research methods:** Integrated mixed methods: oral narratives; physiological measurements; street walkability and urban design audits; and a participant survey. **Participation/engagement with older people:** worked with older people as participants with no involvement beyond this described.	It is stated that the OPUS project has had a 'significant impact on urban design policy at local, national and international levels'. It has raised awareness of the accessibility needs of older people as they navigate town centres. This included impact in Colchester where the study was based. This includes: using OPUS evidence in the Council's 'Better Town Centre' plan' such as 'wayfinding measures', landmarks and signage. A number of other localities also used OPUS's findings in planning documents and processes e.g. North Somerset Council and Age Cymru (older people's charity in Wales). A range of bodies in the UK and Europe have also 'taken up the project findings' in documents, reports and plans. This includes Public Health England, the Government Office for Science Foresight and the European Commission. This impact has benefitted older people indirectly: their views and experiences captured in the OPUS study are having some influence on urban planning and design policy (10).	1. **Engagement with policymakers:** it is likely that there has been some engagement with policy makers including local councils (especially in Colchester) but this is unclear. 2.**Influenced policy:** in 2017 the European Commission Directorate General for Employment, Social Affairs and Inclusion and the World Health Organisation Regional Office for Europe published a policy action handbook 'Age-friendly environments in Europe': it cites OPUS 'frequently'.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Integrating health, care services and housing: innovative and improved ways of helping older people (11) University of Northumbria at Newcastle **Panel A:** Allied Health Professions, Dentistry, Nursing and Pharmacy **Funders:** Innovate UK, Department of Health, North Tyneside Council. **Collaborations:** Knowledge Transfer Partnership (KTP) with North Tyneside Council, Northumbria healthcare (named in references); York University; Newcastle University; Centre for Ageing Better; Elders Council of Newcastle; ID partnership (architect); Plan B (social housing consortium). **Location:** UK based. North Tyneside, regional initially with influence nationally. **Research methods:** Health Needs Assessment (Mixed methods design: Qualitative exploration of tenants' perspectives; analysis of sheltered housing routinely collected data, and analysis of Hospital admission data). Pilot interventions: qualitative case study evaluation mentioned. Phenomenological interviews combined with wearable cameras. Q methodology (process to systematically appraise and rank views). **Participation/engagement with older people:** funding from Innovate UK healthy ageing catalyst to co-design (with older people, health and care professionals) in Garden Village plans (experimental homes).	1)Integrated service pathways between health, social care and housing for older people in sheltered and general housing: improved outcomes, including enabling older people to live independently in their own homes. Three integrated improvements claimed: (i) older sheltered housing tenants being treated in their own homes within two hours instead of long waits for emergency treatments and significantly reducing non-elective hospital admissions and primary care by 60%. (ii) healthy living falls prevention programme now integrated into North Tyneside falls pathway. (iii) Alternative response to ambulance for non-injurious falls (46% of calls for over 65s' falls), reduced "long-lies" and 83% reduction in hospital admission for this group; service delivery changes led to an estimated cost-saving of £620,018 from public sector budget for long-term care, 2015. Rolled out to five localities. Led to Safe and Healthy Homes service for all older residents, not just sheltered housing, estimated to have prevented falls for 18% of older people referred to the service. 2)Impact from KTP onto design and planning for new "Garden Village" (South Seaham), including co-design with older people, health and care professionals), working with planners to embed integration of housing with health and care. 3) Public Policy: (i) North of Tyne devolved authority used KTP outcomes to inform plans. (ii) Centre for Ageing Better used this research as part of their evidence that resulted in increased government spending on disabled facilities grant for home adaptations.	1) **Collaborative**: with North Tyneside Council. Undertook co-design with older people and health and care professionals in the design of housing development; research team worked with planners to embed research findings. 2)**Informed policy regionally and nationally**: cited by regional Combined Authority Housing and Land Board in the North of Tyne; House of Commons report on housing for older people. Used by the Centre for Ageing Better. 3)**Implementation**: rolled-out service integration pathways into housing for older people. 4) **Recognition**: won Municipal Journal (MJ) Achievement Award, 2018 for the alternative ambulance service response (MJ is the management journal for local authority business). 5)**Engagement with stakeholders**: local Council, e.g. housing services, Sheltered Housing schemes; with NHS (Multidisciplinary Teams, Ambulance Service), with housing policy on a national scale (National Government); with Centre for Ageing Better. 6)**Dissemination:** with non-academic publications (the Municipal Journal mentioned).

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Improving the lives of older people in Kenya (12) University of Southampton **Panel C:** Social Work and Social Policy **Funders:** Wellcome Trust; Economic and Social Research Council (ESRC)- Department for International Department; ESRC/University of Southampton (Impact Acceleration Account). **Collaborations:** Research in collaboration with the Africa Population and Health Research Centre (APHRC), Nairobi, Kenya. Co-design research with the Kenyan Ministry of Labour and Social Protection. Worked with a range of in-country stakeholder groups, including HelpAge Kenya, Nairobi County government and local community groups, and the Kenyan Ministry of Labour and Social Protection (MLSP). **Location:** Kenya, sub-Saharan Africa **Research methods:** Prospective population study; Cross-sectional survey; Conditional change logistic regression models; Mixed-methods (quantitative secondary data analysis and qualitative interviews). **Participation/engagement with older people:** Older people mentioned as research participants, with no further description of involvement. Collaborations are focused upon in-country stakeholder groups - there may have been involvement of older people in these groups though it is not described.	Evidence has influenced policy and practice in Kenya and sub-Saharan Africa relating to ageing and the well-being of older people. Three main areas of impact are claimed: i) Evaluation of the Older Persons Cash Transfer Programme (OPCTP) in Kenya led to improvement in the design and delivery of this means-tested benefit. Under the National Safety Net Programme (known as Inua Jamii) this led to ensuring timely benefits for recipients. The programme reaches 1.33 million households with an annual budget of 320 million USD. ii) Further work evidenced the impact of cash transfers in allaying the effects of poverty for older people and their wider kinship networks. Impact is claimed on the decision to roll out a new universal non-means tested benefit to all people aged >70, affecting the lives of 833,000 older people and their families in Kenya. iii)Also claims impact on the case for social pensions for older people more broadly in Sub-Saharan Africa, and on Older People's Human Rights in Africa and further contribution to the African Union Policy Framework and Plan of Action on Ageing (AUPFPAA), co-ordinated by the African Union Social Development Office, Addis Ababa, Ethiopia (12).	1.**Engagement with policy makers/stakeholders:** (Kenyan Ministry of Labour & Social Protection; Nairobi County government). Engagement with NGOs: HelpAge Kenya, local community groups. Direct work with colleagues from World Economic Forum (WEF) Global Agenda Council on Ageing. 2. **Active dissemination:** for example, to representatives of the ILO, World Bank, World Food Programme, National Social Protection Secretariat, and the African Platform for Social Protection, HelpAge International. Dissemination at African Union Specialized Technical Committee on Social Development Labour and Employment leading to the research feeding into the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Older Persons in Africa (2017). Selection by the DFID as a case study to showcase on their website. 3.**Production of resources:** policy and practice briefing paper acted as a resource for advocacy of universal social pensions throughout Sub-Saharan Africa. 4.**Secured funding for impact:** through the University of Southampton/ESRC Impact Acceleration Account to strengthen policy networks and to work directly with the World Economic Forum Global Agenda Council on Ageing.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Using art-based interventions to improve the well-being of older adults with dementia and their carers (13) Canterbury Christ Church University (CCCU) **Panel A:** Psychology, Psychiatry and Neuroscience **Funders:** Wellcome Trust, Arts and Humanities and Research Council, Alzheimer's Society, ESRC, Dulwich Picture Gallery. **Collaborations:** In partnership with museums, art galleries, NHS trusts, Age UK, the Alzheimer's Society, the Royal Society for Public Health (RSPH), and colleagues in CCCU, University College London and the NHS. **Location:** Predominantly UK, but some international impact claimed including Mexico, New Zealand, and Hong Kong. **Research methods:** Grounded theory; quasi experimental study. **Participation/engagement with older people:** not clear from case study	Three forms of impact are claimed: 1)'Embedding art-based interventions and social prescribing in policy. This research has demonstrated that art-based interventions are effective in improving the wellbeing of people with dementia and their family carers, and that such interventions are effectively delivered through the mechanism of social prescribing within existing community assets such as museums and art galleries' [raising policy profile]. 2)'Changing practice through evidence-based resources. 'The research was used to develop three empirically-grounded toolkits, which have provided guidance, training and evaluation to support arts-based services in delivering the evidence-based interventions successfully.' 3) 'Raising awareness of dementia and changing attitudes'. 'Our BAFTA-nominated media work has raised awareness of arts-based interventions through a major exhibition attracting over 1.4 million people, featured on BBC3 and other mainstream media channels.'	1)**Influencing policy:** raising policy acceptance of arts based interventions and social prescribing in policy circles by, for example, providing evidence to the All-Party Parliamentary Group (APPG) inquiry on Arts, Health & Wellbeing (2015-2019), round tables on Dementia and the Arts (2015) and Museums and Health (2016), the research was cited 10 times by their report. Influenced NHS to incorporate 'arts on prescription' into commissioning plans, led to government commitment of £5m to create a National Academy for Social Prescribing. 2)**Provided resources:** produced tool kits used by museums etc. to improve guidance and training on working with people with dementia. 3)**Raising public awareness:** of the issues through films, an installation etc. and coverage in the broadcast media. 4)**Collaborative**: worked with the NHS and museums and national organisations which work with older people.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Silver Shoppers: designing a better supermarket experience for the older customer (14) University of Southampton **Panel D:** Art and Design: History, Practice and Theory **Funders:** Economic and Social Research Council **Collaborations:** Collaborators from Tsinga and Brunel universities. Other collaborators were Sainsbury's (a supermarket chain) who participated in focus groups and facilitated in-store observations and the charity Age UK, who supported the recruitment of study participants. **Location:** UK and China. **Research methods:** Ethnographic research and product design. **Participation/engagement with older people:** involved co-design with older people. In relation to underpinning research: 'Researchers designed an ethnographic user study that used 'cultural probes', an experimental technique to gather information for design inspiration, to analyse the shopping experiences of 30 British and Chinese older customers for six weeks' (14).	The research enhanced UK and Chinese retailers' understanding of the unmet needs of older customers' needs in supermarkets, including in relation to layout, signage and shelf design. 'The project brought together researchers, older people, retailers, charities, students, design professionals and consumers in co-design activities. It raised awareness among these participants, and the wider public, of everyday challenges faced by older people, and the opportunities to redesign the shopping experience'. The research resulted in the design of new products to improve the shopping experience for the older generation, including an augmented trolley (patented). The outputs include working with design company to develop a prototype smart trolley which includes in-store-navigation.	1**) Active dissemination:** coverage on the broadcast media (ITV News Meridian). Inclusion in major UK design exhibitions – the Retail Futures Exhibition and the London Design Festival both in the UK. 2)**Targeted findings:** by sharing results with supermarkets in the UK and China. 3)**Collaborative:** including universities, industry and Age UK. 4)**Co-design**: says 'through co-design of innovative products and services aimed at improving older people's shopping experience, the Silver Shoppers research project has engaged the retail industry, design professionals, age-related charities and consumers across generational divides to address inclusive design for everyday challenges'.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Changing hearts and minds: How the stories of older LGBT people are changing attitudes, education and care (15) Bournemouth University **Panel C:** Social Work and Social Policy **Funders:** The National Lottery Community Fund, the Economic and Social Research Council (ESRC). Big Lottery. **Collaborations:** Hampshire County Council **Location:** Global – impact is likely to have occurred globally since the film "RUFUS STONE" was shown worldwide and viewed in 73 countries. Various organizations and institutions like Hampshire County Council, Help and Care UK, and the Alzheimer's Society are also mentioned in relation to the impact. This shows that impact was not limited to a specific location, but rather reached a wide audience and was implemented in various settings. **Research methods:** Biographic Narrative Interpretive Method, Visual Ethnographic Method, and Participatory Methodology. **Participation/engagement with older people:** older people were actively involved in shaping the research direction and providing input on the study design. The research used participatory methods, allowing participants to contribute their perspectives and experiences directly to the research process. Older people were also involved in creating a resource aimed at promoting awareness of the diversity of the ageing population. Overall, the case study demonstrates a commitment to user participation and engagement, specifically involving older people.	The work of Dr Kip Jones, Professor Lee-Ann Fenge, Dr Rosie Read, and Dr Marilyn Cash has resulted in changing attitudes, education, and care for older LGBT people. The research aimed to address the loneliness, isolation, and increased risk of suicide faced by older gay men and lesbians. The findings of the research led to the creation of the film "RUFUS STONE" and the "Methods to Diversity" card deck. The impact of this work includes changing attitudes through the film's worldwide screenings, which have been viewed over 17,800 times in 73 countries. "RUFUS STONE" is also used in teaching at several universities globally and has transformed frontline care through training sessions with Adult Services staff at Hampshire County Council, Help and Care UK, and the Alzheimer's Society. Overall, the impact of the research and its outputs has contributed to changing attitudes, improving education, and transforming frontline care for older LGBT people, leading to a better quality of life for this underrepresented group.	1. **Active dissemination:** film screenings and festivals: "RUFUS STONE" has been shown globally at community cinemas, universities, and festivals, raising awareness. 2. **Teaching and education**: The film is used in universities worldwide, especially in sociology modules, and has had a positive impact on students. 3. **Training and resources:** The 'Methods to Diversity' card deck, created through participatory methods, supports training efforts and guides staff towards inclusive practices. 4. **Engagement with organizations:** The involvement of Hampshire County Council, Help and Care UK, and the Alzheimer's Society in the impact section has led to changes in attitudes and awareness among their staff. These organizations have utilized the film and the Method Deck in their training sessions, facilitating the dissemination and implementation of the research findings and resources. 5. **Media engagement:** The film "RUFUS STONE" has gained media attention, including a feature in The New York Times, which has helped to increase interest and attract new audiences, further contributing to its impact. 6. **Multi-disciplinary team:** The multi-disciplinary team involved in the research and impact efforts includes researchers from social science, social care, and performative arts. This approach has enriched the research findings and enabled dissemination through various channels.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Improving the safe use of medicines for older people living in care homes across the UK (16) The University of Leeds **Panel A:** Allied Health Professions, Dentistry, Nursing and Pharmacy **Funders:** Department of Health & Social Care; National Institute for Health and Care Research (NIHR); The Health Foundation **Collaborations:** The University of London School of Pharmacy and the University of Surrey collaborated on the Care Homes' Use of Medicines Study (CHUMS), which involved collaboration with various teams and care home pharmacy professionals. **Location:** UK **Research methods:** Randomised controlled trial; Cochrane review. **Participation/engagement with older people:** the case study does not mention older people's involvement in the research process but focuses on the University of Leeds' impact on safe medication use for older people in care homes. Interviews with GPs, pharmacists, and care home staff are mentioned, but not older people's direct participation in co-designing or co-researching studies.	The University of Leeds conducted research which has improved the safe use of medicines for older people in care homes across the UK. The research findings led to a ministerial-led summit, a Health Alert from the Department of Health, and policy and practice changes nationally. Learning programmes were developed and delivered to over 2000 pharmacy staff, improving safety and care in care homes. The Medicines Optimisation in Care Homes (MOCH) Programme was developed, integrating new pharmacists and pharmacy technicians into primary care and social care teams across England. The research findings have been included in influential national plans and strategies, resulting in improved medication safety, better care provision, and enhanced quality of life for older people living in care homes.	1. **Engaging with policymakers:** the findings led to a summit and a 'Health Alert' from the Department of Health. NHS trusts had to act right away. The researchers talked with policymakers to discuss what to do next. 2. **Collaborating with healthcare professionals**: in which they worked together to identify and fix medication errors, leading to practice changes and new services. 3. **Disseminating and training:** development of learning programmes by the Centre for Pharmacy Post-graduate Education . 4. **Influencing national guidelines and standards:** used in National Institute for Health and Care Excellence (NICE) guidelines for managing medicines in care homes, which the Care Quality Commission uses for inspections and assessing care quality. 5. **Involvement in national initiatives:** team member (Alldred) helped design and implement the NHS England MOCH Programme, which added new pharmacists and pharmacy technicians to primary and social care teams in England. 6. **Contributing to evaluation and improvement efforts:** The CHIPPS Core Outcome Set helped MOCH's evaluation plan, with team member (Alldred) as an expert adviser. It also informed NHS England's Medicines Safety Improvement Programme to reduce medication errors in care homes. Alldred gave advice to design a national project for this reduction.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Housing & Later Life: improving older people's access to housing-related information and advice through policy and service reforms in France (17) Swansea University / Prifysgol Abertawe **Panel C:** Social Work and Social Policy **Funders:** The underpinning research was commissioned by the French Ministry of Research, Mission de la Recherche. **Collaborations:** Collaboration with a French researcher (the researcher institution was not referenced). Some collaboration with French housing providers for case study research **Location:** France **Research methods:** Comparative analysis with literature review; in-person, qualitative interviews and analysis; analysis of policy documents. Follow on small-scale case study. **Participation/engagement with older people:** not specified apart from older people as research participants	It is claimed that the research evidence from a project which compared French and British policies and frameworks for housing adaptations and environments for later life has informed change to policy legislation in France regarding housing needs and independent living of their older population. This has led to improvements in service accessibility and the wellbeing of older people in France. The following impacts are claimed: 1)Changes to policy legislation in France; Parliamentary Bill and statutory law. This involved a named individual (Broussy) commissioned by France's Ministry for Older People and Autonomy using the research findings, and specifically details of UK services regarding development of housing information hubs and using this to produce a report regarding implementation of similar approaches in France, which included a national policy objective. The report was presented to the French parliament in 2014 and made law in 2015. Broussy developed the report into a book which cites the underpinning research and is claimed is a benchmark for community housing organisations (referenced in publications). 2)Changes to services; between 2017 and 2019 21% of all French departments created information hubs; leading to 20 information hubs and 58 satellite hubs in 2019. Impact is supported by a report from one such hub/ satellite hub in 2019 which revealed response to 208,000 enquiries. Also, a national on-line portal (internet and phone) was created in 2015 to provide information about housing and housing related services. It is claimed that the portal has significantly improved accessibility with an average of 250,000 visits per month. This is supported by details of a survey completed in 2017 regarding the positive impact of the portal 3) The experiences of housing service providers and older service users. Further research conducted to explore the impact by service users highlighted the nature of improved service access and coordination, and the quality of the service as experienced by older people.	1) **Influenced policy:** adoption of the research findings/ recommendations by French policy makers, and from this, legislated changes to housing practice in France, which are described in detail. 2) **Implementation into practice:** services restructured to create information hubs, together with a national on-line portal.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
LifeCurve software for assessing functional decline (18) University of Newcastle upon Tyne **Panel A:** Public Health, Health Services and Primary Care **Funders:** Medical Research Council, AXA research fund **Collaborations:** with occupational therapists, company ADL SmartCare **Location:** UK, Australia **Research methods:** Epidemiology; applied research with cohort study; modelling study. **Participation/engagement with older people:** not specified apart from older people as research participants	The researchers claim to have identified how activities of daily living (ADL) ability in older age is lost in a specific and predictable order. They have used this knowledge to create a framework called "Compression of functional decline'. The premise of the impact is that if decline can be identified earlier through application of a measure and interventions provided in response, decline in ADL ability can be delayed. The following impacts are claimed: 1)UK practice where the Lifecurve tool has been used since 2015 within 10 Local Authorities across England and Scotland, and by a private homecare provider; a total of 10.098 assessments. Illustrations are also provided regarding how some Local Authorities are using the results of these assessments to provide training to staff, identify necessary interventions and provide targeted interventions. 2)Older people in receipt of services and those providing services. This evidence is derived from the reports of care providers. 3)International practice and research. In 2020 the assessment was adopted by the Australian Department of Health and incorporated into their guidance for home care providers. The measure was also included, in 2020 in a 4 year research project led by the University of Auckland, New Zealand. 4)Scottish health policy where it was incorporated in 2017 into an Active and Independent living programme. This led to the tool being incorporated into 13,448 surveys by Health Care Practitioners and service users to detect population and individual scores. It is claimed that identifying need via the measure and providing timely interventions, as opposed to identifying people when more decline has occurred can result in substantial savings for services. However, whether this has been realised is not detailed.	1)**Research and development process:** by providing robust reliable and valid methods of measuring ADL ability and using this to create the Lifecurve software 2)**Influencing national policy**: the Scottish Government used Lifecurve in 2017 to inform policy designed to improve the health of the population and identify the cost savings that can be derived from early identification of decline and providing interventions in response. 3)**Influencing international policy:** adoption of Lifecurve by the Australian Department of Health to influence the provision of their Commonwealth Home support program. 4)**Informed care policies and practice**: Local Authority/ care provider policies and practice to inform staff training and determine new methods of assessment and service pathways.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Putting long-term care in low and middle income countries on the global policy agenda (19) The University of East Anglia (UEA) **Panel C:** Anthropology and Development Studies **Funders:** Engineering and Physical Sciences Research Council, Medical Research Council, Economic and Social Research Council, UK Research and Innovation **Collaborations:** King's College London University; researchers in Mexico, Peru, China, Nigeria; stakeholder collaboration to develop emergency strategy - the Coordinate, Identify, Assess and Target (CIAT) Framework. **Location:** Low and middle income countries. Brazil, Argentina, Mexico. **Research methods:** Methods include: comparative analysis; intervention study; linking quantitative epidemiological analysis to nested in-depth qualitative case studies; evaluation. Indicates 'applied a range of innovative methodologies, including ethical, covert research by local older women'. **Participation/engagement with older people:** the case study states that the research 'applied a range of innovative methodologies, including ethical, covert research by local older women, in Argentina to reveal care home practices in more depth. This confirmed the abuse of residents' human rights, including coercive admission, deprivation of liberty and over-crowding' (19).	The research responds to long-term care (LTC) needs in low and middle income countries. Research by UEA led to identifying LTC as a global development issue by agencies such as the World Health Organisation (WHO) and to significantly shaping the emerging policy agenda. Specific impacts include: i) Influencing agencies such as UN Women to address LTC and gender injustice for the first time. ii)Informed interventions to support female caregivers in Brazil. iii) Improved accountability in care homes and reduced exposure to abuse for residents in Argentina. iv)Developed new strategies in care homes to limit the effects of the COVID-19 pandemic in Mexico and other countries.	1) **Collaboration:** international level for the research. 2) **Policy influence:** World Report on Ageing and Health, WHO, 2015, contributed as core author. Involved in WHO's Technical Guidance for Managing COVID-19 in care homes as a member of the scientific expert committee, 2020. Influenced UN Women 'Progress of the world's women 2019-2020' report. 3) **Policy uptake to inform changes:** for example, WHO Report, 2015, incorporated into WHO's Global Strategy for Older People, WHO's Decade of Action on Healthy Ageing, 2020, ratified by the UN General Assembly, 2020 to support global LTC policies. 4)**Uptake at local and national level**: care home regulation, Argentina Ministry of Health regulatory protocol, led to establishment of a coalition and development of an interactive online platform to provide feedback. Brazil - interventions to support family carers, policy think tank report cites research. 5) **Recognition**: won a UKRI Healthy Longevity Global Grand Challenge Award, which provided funds and expert support to extend and scale up the intervention in other cities, 2020.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Accessing the outdoors: improving public policy on green spaces to benefit health and wellbeing (20) University of Edinburgh/Heriot-Watt University (Edinburgh Strategic Alliance) (joint submission) **Panel C:** Architecture, Built Environment and Planning **Funders:** Forestry Commission Scotland, National Institute for Health and Care Research, Department for Culture Media and Sport and Department for Communities and Local Government, UK Research and Innovation. **Collaborations:** Edinburgh and Heriot-Watt Universities, University of York, King's College London. The research was in partnership with national and international stakeholders (this is likely to be local government, health and social care). **Location:** UK, Scotland, worldwide. **Research methods:** Surveys, quasi-experimental study, mapping, biomarker, EEG (electroencephalography) and co-design methodologies. **Participation/engagement with older people:** co-design with older people in the Mobility, Mood and Place (MMP) research project (2013-2017).	The research team provided new evidence about the health benefits of green environments. This led to informing planning policy both nationally and internationally, including the World Health Organisation (WHO), the UK Department for Environment, Food, and Rural Affairs (DEFRA), National Institute for Health and Care Excellence (NICE), Scottish Government and Parliament, and UK local councils. The Mood, Mobility and Place research project involved participation of over 900 people aged over 65. A co-design strategy was used to identify criteria for age-friendly environments. 'This research highlighted the need for suitable pavements, benches, and street lighting, as well as four characteristics of places that influence quality of life: access for all; access to nature; access to others; and access to light' (20). National policy developments acted as a catalyst for change at a local level, for example, in the Local Development Plan of Moray Council compliance is now assessed against the key findings from the Mood, Mobility, Place project. The pilot evaluation of Green Health Partnerships, 2019 which were set up as part of the Our Natural Health Service (ONHS) as an action programme indicates that they 'engaged with 230 partners, promoting 350 green health opportunities, delivered 225 capacity building activities, and connected with an estimated 11,200 people in the health and environment sectors' (20).	1) **Collaborative:** worked in partnership with national and international stakeholders, participation/co-design with older people. 2) **Received commissioned projects:** to directly inform organisations and government (Forestry Commission Scotland) and the GreenHealth Project for the Scottish Government 3) **Policy influence:** for example, invited by WHO to contribute and co-author a report, invited by NICE to provide expert testimony; WHO recommendation on indicators, authored and cited in WHO reports. UK government's 25 year plan (2018), NICE incorporated into 'Guidance on Physical Activity and the Environment'. Included in the Scottish Government's consultation paper, informed Scottish Parliament committee, 2018. Indicator incorporated into the Scottish National Performance Framework. Informed Place Standard, NHS Scotland/Scottish Government/Architecture and Design Scotland, 2016. Cited in paper by NatureScot (Scotland's Nature Agency) to the Cabinet Secretaries for Health and Environment, 2016. Led to the setting up of ONHS, 2016. 4)**Resources to support use**: WHO toolkit and brief for action to support practice. Delivered capacity building activities as part of Green Health Partnerships. NHS Scotland Place Standard online tool and document. 5)**Implementation into practice**: ONHS established Green Health Partnerships, 2018. Example of Moray Council Local Development Plan, 2020 and use in planning guidance.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
The Dewis Choice Initiative: Transforming the response to domestic violence and abuse in later life (21) Aberystwyth University / Prifysgol Aberystwyth **Panel C:** Law **Funders:** Welsh Government; Older People's Commissioner, Wales; National Lottery; UK Portfolio 'Accelerating Ideas'; Comic Relief; National Community Fund; Ministry of Justice. **Collaborations:** members of Older People's Commissioner (OPC) (Wales) strategic and working groups, and members of the Welsh Government and OPC's Action Groups. **Location:** UK, Wales, Scotland **Research methods:** Participatory action research, qualitative longitudinal design, co-production methodologies. **Participation/engagement with older people:** Indicates that the Dewis Choice service was co-created with older people.	The research challenged perceptions that Domestic Violence and Abuse (DVA) only occurs in women under 45 years of age. The research addressed improving the wellbeing of older victim-survivors of DVA through access to justice and welfare services. Impacts include: i) Development of the Dewis Choice service which brings together approaches to justice and wellbeing for older victim-survivors of DVA across Wales. It is stated that Dewis Choice is 'a unique co-produced justice and welfare service, which safeguarded older victim-survivors'. ii)Informing public services and delivery for older victim-survivors of DVA across the UK. iii) Informed national guidance and campaigns to protect and safeguard older people in Wales. The case study provides feedback comments from older victim-survivors, to show that the Dewis Choice service is used through referrals received.	1) **Co-produced with older people:** Dewis Choice co-created with involvement of older people. 2) **Engaging with policymakers:** acted as members of Welsh Government and OPC strategic and working groups. 3)**Informed policy:** including Welsh Government National Safeguarding Guidance, Mid-West Wales Regional DVA Strategy, incorporated into Dyfed-Powys Police Crime Commissioner (PCC) Police and Crime Plan (2017-2021). Online training endorsed by the OPC, resource incorporated into the Wales Victim Prevention Unit COVID-19 resource pack for safeguarding practitioners and service providers and in a Public Health Wales briefing on COVID-19 and violence for the World Health Organization, Europe. 4) **Resources to support use:** For example, the largest UK provider of DVA training, SafeLives, embedded Dewis Choice training into its practitioner training, including practitioner training funded by the Welsh Government and Home Office. Training across Scotland provided for regional safety partnerships (health, and social care, police and third sector organisations). In response to Covid-19 provided online training. Practitioner guidance. LGBTQ short film. 5) **Active dissemination:** of 2000 copies of practitioner guidance, face to face training including LGBTQ short film delivered to 8,046 individuals and online training developed. Welsh Government campaigns 6) **Implementation:** indicates that the service is the only route for older people experiencing DVA in Wales. Service incorporated into the Mid-Wales Regional Pathway to Support. 7) **Award winning:** nominated by OPC for Audrey Jones Memorial Award for Feminist Scholarship, 2016 - recognition of national award for 'transformative research'.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Developing the Fuller Working Lives Policy Agenda through Research-Based Professional Advice, Expert Testimony, and Stakeholder Engagement (22) The University of Kent **Panel C:** Social Work and Social Policy **Funders:** Joseph Rowntree Foundation; Department for Work and Pensions; Medical Research Council /Economic and Social Research Council. **Collaborations:** Universities of Bath, Edinburgh, Manchester and Newcastle. The case study states that they worked with a range of stakeholders to design implementation materials and initiatives. **Location:** UK **Research methods:** Qualitative studies, dataset work (includes cluster, and multinomial logistic regression analyses), case studies. **Participation/engagement with older people:** not noted. Focus seems to be with stakeholders.	The research addressed the growth of older workers in the labour market. The need for fuller working lives of individuals and succession planning for businesses has emerged as one of the challenges in terms of balancing these needs. Impacts include: i)Informed policy – the research has contributed 'significantly' to the evidence used by policymakers and other stakeholders in their decision making. ii) Contributed to the development and implementation of national policy.	1) **Direct engagement with policymakers:** for example, asked by the Department of Work and Pensions (DWP) to proofread and comment on draft policy which formed a foundation for key Government policy on older workers 'Fuller Working Lives'. Appointed as a Specialist Adviser to the House of Commons Women and Equalities Committee Investigation into 'Older People and Employment'. Submitted written evidence to Parliamentary inquiry which informed recommendations in the final report with regard 'to the heterogeneity of older people, gendered ageism, and the constraints on flexible working.' Worked with key stakeholders to design implementation materials. 2)**Informed policy:** incorporated into national policy, "Fuller Working Lives'; research singled out by DWP; extensively cited by Parliament; Specialist Adviser role and submission of written evidence. 3)**Resources to support use:** design of implementation materials. Includes a video resource, video posted on DWP YouTube channel, guidance brochures, ran workshops, mid-life MOT 'products'. 4) **Enhanced public understanding:** to improve take-up - media coverage (print and broadcast).

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
CINAGE: Creative Approaches to the Active Ageing Agenda through Film and Theatre-making (23) Leeds Beckett University **Panel D:** Music, Drama, Dance, Performing Arts, Film and Screen Studies **Funders:** European Commission, European Erasmus+Supporting Professional Skills and Knowledge Exchange for Theatre Practitioners , Stand and Be Counted award (unclear who this is from). **Collaborations:** Seven European partner organisations involved in the research (details not provided). EU Erasmus+study in partnership with Káva Drama/Theatre in Education Association (Hungary), Collaborative Reichenow (Germany), Roy Hart International Arts Centre (France), Shoshin Theatre Association (Romania). Formal partners - AidLearn; Consultoria em Recursos Humanos, Lda; Associazione Centro Studi Città di Foligno; Slovenian Third Age University. **Location:** UK, Romania. Belgium, Canada, France, Germany, Hungary, Italy, USA - performances. Workshops - UK, France, Germany, Hungary, Romania, India and Iran. UK - Leeds, Bradford, South Yorkshire. **Research methods:** Narrative, participatory research, qualitative. **Participation/engagement with older people:** participation of older people in the projects. For example, 'Talkin Bout My Generation' which focused on the concerns of people over 60, produced films and live performances by older people with findings shared in a co-authored book chapter, documentary film and journal article. Inter-generational collaboration an aspect of the activities.	The research responds to the needs of an ageing population and ageing well. CINAGE/Live explored the use of autobiographical stories and the benefits of turning these into films and theatre performances, with people aged over 55. The projects led to benefits for 75 older people in terms of confidence, independence and becoming socially connected in the UK and Romania. The case study includes comments from participants in the evaluation including, '…celebrate our lives…and share our fun and sparkle with those who might have thought we were past it' and '…I can contribute to society' and 'our lived lives mattered', 'making us feel more alive, appreciated and joyful' (23). Film screenings and theatre performances in Belgium, Canada, France, Germany, Hungary, Italy, Romania, USA and the UK raised awareness of older people's experiences. It is stated that the projects set examples for the Shoshin Theatre Association, Romania; Stand and Be Counted Theatre (SBC), Bradford; and Leeds City Council (LCC) for their own work.	1) **Collaborative:** EU funded studies, 7 project partners. 2) **Participatory:** involvement of older people in the projects/production of outputs. 3) **Active dissemination:** raising awareness, targeted activities at specific events/festivals, films shared publicly, YouTube collection, received commissioned radio version broadcast for 'Talkin Bout My Generation', broadcast media. 4) **Development of resources:** Guide for Educators produced, guide to better active ageing, workshops to promote active ageing internationally, Slovenian Third Age University course, project to deliver training for wellbeing and employability, specific funding for training and practice 'Applying and Integrating European Theatre Training' (ATIPA).

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Falls prevention amongst older people: Increased reach and further impact of interventions, uptake and adherence (24) The University of Manchester **Panel A:** Allied Health Professions, Dentistry, Nursing and Pharmacy Continued impact case study **Funders:** European Commission **Collaborations:** International research study collaborations. EU Prevention of Falls Network for Dissemination (ProFouND- led by University of Manchester, 33 institutions, 14 countries). Policymakers, Voluntary and Community sector; local authority. **Location:** Europe, Australia, New Zealand, Asia, Worldwide. **Research methods:** Epidemiology; randomised controlled trial. **Participation/engagement with older people:** Older people - Centre for Ageing Better testimonial videos/case studies. Participation is not directly described in the case study.	The research addressed challenges associated with falls in older people which are common and can have serious consequences. The case study is focused upon falls prevention and improving uptake. The case study is a continued impact case study and since 2014 new impacts include: i)Policy and guidelines – 'the Falls Management Exercises (FaME) programme is included in Public Health England (PHE), NICE, and US Centers for Disease Control and Prevention (US CDC) guidance'. ii)Cost-effectiveness – an estimate from PHE indicates a societal return on investment of GBP2.28 for every GBP1.00 spent from the FAME programme. iii)Capacity building and implementation – 'in the UK >1,100 newly trained FaME instructors are delivering interventions…FaME has been implemented as part of an exergame (fitness video game) for digital delivery'. '260,000 booklets which include FaME exercises have been distributed during COVID-19 lockdowns in 2020'…recognised as 'best practice by WHO'. iv)Uptake and benefits for older people: 'in 2019 an estimated 172,000 UK older people did FaME exercises. Since 2013, up to 424,554 falls and up to 21,000 fractures have been prevented in the UK' (24).	1**) Collaborative:** extensive international collaboration - EU Prevention of Falls Network for Dissemination. Worked with a technology company to extend the reach of FaME+. 2) **Informed policy:** adopted into falls guidelines and policy nationally and internationally 3) **Engagement with policymakers:** briefings to policymakers, submitted written evidence, worked with national and international guideline development bodies (PHE, RoSPA, NICE, British Geriatrics Society, US CDC, AgeUK, Centre for Ageing Better). Keeping Well at Home and Keeping Well this Winter recognised as best practice by WHO. 4) **Implementation support:** Implementation Toolkit endorsed by NICE. Undertook training through a not for profit national training provider, Later Life Training Ltd, implemented into exergames platform to extend use. FES-I created a website, translated into 35 languages. Falls prevention booklets developed and circulated. Worked at local level with Greater Manchester Combined Authority to support service configuration. 5) **Timeliness:** Covid-19 pandemic giving further impetus to the work due to risk of deconditioning and falls resulting from lockdown. 6) **Active dissemination:** international network conferences, distributed booklets, website.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Mathematical modelling of an aneurysm sealing system triggers patient safety policy that withdraws surgical practice from the NHS (25) The University of Liverpool **Panel B:** Mathematical Sciences **Funder:** Engineering and Physical Sciences Research Council (EPSRC) **Collaborations:** Collaboration with NHS clinicians/EPSRC Liverpool Centre for Mathematics in Healthcare. **Location:** UK, Liverpool, Greater Manchester **Research methods:** Mathematical modelling. **Participation/engagement with older people:** not noted.	In the UK all men aged 65 are invited for screening for abdominal aortic aneurysms which can be life-threatening. The NHS used two keyhole surgical procedures for abdominal aortic aneurysms, including from 2013 the Nellix® EndoVascular Aneurysm Sealing (EVAS). In 2016, potentially life-threatening complications were reported by surgeons with unexplained movement of the device. The research team developed a mathematical model of an aneurysm sealing system. This led in 2019 to the device being fully withdrawn from the NHS and 'new national patient safety regulations, mandating a lifesaving change in surgical practice. Approximately 837 patients across the UK have benefitted from safer alternative treatment and lifelong monitoring' (25).	1)**Collaboration:** with the NHS. Links established through the EPSRC Liverpool Centre for Mathematics in Healthcare. The research team were approached by the NHS as the problem was unsolvable with clinical data alone. 2)**Research evidence:** able to create bespoke model with clinical data to explain critical patient safety issues with the Nellix EVAS system. Clinical involvement in publications providing further credibility for practice change. 3) **Policy recommendation:** mandatory policy recommendation from the UK's Medicines and Healthcare Regulatory Agency (MHRA), 2019 led to complete withdrawal of the device in the UK. MHRA issued a Medical Device Alert. 4)**Implementation into practice:** led to changes in practice, withdrawal of system in clinical practice.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Co-Creating Cultural Heritage in Post-War Italy: enhancing older people's wellbeing through digital inclusion and intergenerational collaboration (26) Oxford Brookes University **Panel D:** Music, Drama, Dance, Performing Arts, Film and Screen Studies **Funders:** Arts and Humanities Research Council (AHRC), British Academy/Leverhulme **Collaborations:** The Universities of Bristol and Exeter. Project partners included UNITRE (University of the Third Age in Italy) and Memoro (Memory Bank). The case study states that other interdisciplinary collaboration involved universities, public and private archives, general public and cultural organisations. **Location:** Italy. UK. **Research methods:** Oral history, qualitative comparative study, mixed-methods ethnographic methodology. **Participation/engagement with older people:** participation of older people in cultural heritage creation and preservation - co-created a digital archive where they are curators and users.	The research team undertook research in Italy to enable the participation of older people in co-creating cultural heritage (who in 2013 were over 65 years of age). Impacts claimed include: i) Enhancing the wellbeing of older people through opportunities to reminisce. ii)Co-creating a digital archive which forms a lasting legacy for future generations of intangible cultural heritage. ii)Facilitated inter-generational collaboration between older and younger audiences raising understanding. iii)Enhanced public understanding of Italian cultural heritage. The main beneficiaries 'were older people, who have been largely ignored in the creation of culture, especially in digital and online contexts. Through CINERICORDI they have become part of a community forged through cinema-going: this has enabled them to be at the forefront of reconstructing the history of post-war Italian film culture, traditionally only written by film scholars' (26).	1) **Collaborative:** worked with universities, public and private archives, general public and cultural organisations. 2)**Interdisciplinary** international team. 3) **Co-creation with older people:** digital archive produced. Intergenerational collaboration with younger people helping older users to use digital formats. 4) **Funding for impact:** AHRC impact and dissemination follow-on funding. 5) **Public engagement:** 10 public engagement events held, project websites, print and broadcast media. Used crowd-sourcing to build material. 6) **Resources to support use:** online and face to face training provided. 7) **Enhanced educational understanding:** ran a national competition to engage with the digital archive, developed new materials for teachers.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Ages and Stages: The Place of Theatre in the Lives of Older People (27) University of Keele **Panel C:** Social Work and Social Policy **Funders:** New Dynamics of Ageing Programme (NDA)/Canadian Institutes of Health Research, Arts and Humanities Research Council, Paul Hamlyn Foundation, Big Lottery Reaching Communities Fund. Collaborations: Collaboration between Keele and the New Vic Theatre (Staffordshire), and partner project with the University of Alberta, Canada. **Location:** UK: Leeds, Manchester, Suffolk, Stoke on Trent, Staffordshire mentioned. **Research methods:** Archival and empirical research, interviews with older people, ethnographic data; critical review; interdisciplinary methods; use of a critical gerontological approach with arts-based educational practices. **Participation/engagement with older people:** the NDA project involved interviewing 95 older people and 16 of these performed in community venues as part of an intergenerational documentary. This led to benefits for those involved in performing and attending, for example forming new relationships and gaining new skills.	This interdisciplinary research collaboration explored the relationship between perceptions and experiences of ageing and creativity. The collaboration established a thriving elders' Theatre Company, influenced practice in arts and community organisations through 'programmes of workshops, performances, an annual arts festival and extensive outreach work'. Areas of impact include: i)Influencing the creative practice and outreach work of the New Vic. The Ages and Stages Theatre Company is hosted by the New Vic and has an intergenerational ethos and training programme. Activities include, 8 new productions; the distribution of 500 DVDs of 'Our Age, Our Stage'; performance at the Latitude Festival (Suffolk) attracting 40,000 people over the four days. ii)Enhancing relationships and skills resulting in enhancement of quality of life with benefits for company members (e.g. through new relationships and wellbeing) and communities (skills learnt by the company that benefitted the wider community). iii)Changed practice in arts and community organisations, for example, 'Meet Me at Live Age' is reported to have increased the co-capacity of the 10 artistic practitioners involved.	1)**Collaboration:** with theatre companies. 2) **Community outreach:** establishing an elders' theatre group and annual festival which fostered late life creativity and led to underrepresented groups attending events, and the development of community-based events for older people. (3) **Influenced creative practice:** e.g. working creatively with older people and fostering an intergenerational ethos and extending reach (new productions created) 4) **Training and skills development:** practices have changed in arts and community organisations e.g. new practices in how organisations work creatively with older people and changed approaches to community engagement.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Lab4Living: design to promote quality of life and wellbeing (28) Sheffield Hallam University **Panel D:** Art and Design: History, Practice and Theory **Funders:** British Council, National Institute for Health and Care Research i4i, Marie Curie, NES, Alliance Scotland. **Collaborations:** collaboration with neurologists clinicians, and industry. **Location:** UK, worldwide. **Research methods:** Design methodologies; collective making; co-design; thinking through things methodology; co-design intervention development. **Participation/engagement with older people:** the methodological approach put end-users at the foreground of the research, e.g. the research on Motor-Neurone Disease (MND) included a series of collaborative workshops with neurologists clinicians, industry, people with MND and their carers; the dementia research brought together people with dementia and family and led to a co-designed intervention.	The Lab4Living research team has responded to the needs of people living with long-term health conditions through developing products which place emphasis upon dignity and enhancing quality of life. Central to the research methodology has been bringing people together and using co-design. Four main areas of impact are described: i)Development of the Head-Up neck orthosis. It is claimed that this has delivered 'life-changing' improvements for people living with Motor-Neurone Disease(MND). The device is used at 25 NHS Trusts in the UK and available worldwide. ii) For women who are undergoing breast cancer treatment the Lab4Living's Support4All garment was developed. This has two-fold benefits in enhancing modesty and dignity for women and also increasing clinical accuracy of radiotherapy. iii)Development of Life Cafés which aim to support open conversations about end of life care. Marie Curie, a national terminal cancer charity, have adopted Life Cafés as part of their practice in enhancing end of life care. iv) The Journeying through Dementia intervention programme has been used to shape national policy and care provision in Scotland and Wales.	1)**Co-design:** embedded methodologically within an ethos of ensuring dignity and quality of life with a focus on the end-user. 2)**Collaboration:** for example with healthcare professionals, industry, carers and end-users. 3)**Received commissioned projects:** for example Marie Curie programme of work. 4)**Policy influence:** for example, the journeying through dementia research forms a key part of the dementia strategy for allied healthcare professionals in Scotland. 5)**Commercial license for product:** the Head-Up neck orthosis received a commercial license, it is manufactured and extended to new markets. 6)**Adoption into practice:** for example, Marie Curie are using Life Cafés as part of their national programme. Journeying through Dementia has been adopted by Alzheimers Scotland and implemented into some Scottish health boards. 7)**Resources to support use:** for example, the materials from the Journeying through Dementia programme are available from the Alzheimers Scotland website. 8)**Active dissemination:** for example, International Design4Health conference, Design for Health journal and the Design4Health Global Network. 9) **Recognition:** received the Expanding Excellence in England award, 2019 for the portfolio of work at Lab4Living.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Ageing as Embodied Time: Using Literature to Understand and Improve Wellbeing in Older Age (29) The University of Warwick **Panel D:** English Language and Literature **Funders:** Arts and Humanities Research Council and Research Council of Norway **Collaborations:** University of Bristol and University of Bergen, Norway. **Location:** UK, USA, Norway **Research methods:** Critical medical humanities. **Participation/engagement with older people:** None noted.	The research addresses what health and wellbeing mean for individuals and communities and brings insights on 'understanding patients' subjective experience of time and ageing'. It is stated that the approach is 'unique' drawing upon modernist literature. These insights are particularly applicable in the care of people living with dementia. This has led to influencing and informing the work of healthcare professionals in geriatrics and has been used to enhance the patient care of older people. In collaboration with healthcare professionals such as psychologists, psychiatrists and geriatricians a series of workshops and training has been held to inform patient care. These include events at the University of Bergen, the annual meetings of the International Association of Gerontology and Geriatrics, the British Geriatrics Society and at the New York Institute of Psychoanalysis. Examples from clinicians are described outlining how the work has been valuable in their clinical practice and related teaching to improve patient care.	1)**Collaborative with healthcare professionals:** involved psychologists, psychiatrists and geriatricians. 2)**Training and development:** undertaking workshops and training sessions with healthcare professionals. 3)**Public understanding:** for example, talks were made available for the public on YouTube.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Retirement income research informs UK and European policy debates (30) University of Bristol **Panel C:** Business and Management Studies **Funder:** Economic and Social Research Council **Collaborations:** University of New South Wales, Australia (involvement is noted in reference 5). **Location:** EU, UK. **Research methods:** Time-series estimates. **Participation/engagement with older people:** None noted.	The research team responded to the challenges of an ageing population and provided evidence to address the needs of ensuring that pension incomes are priced fairly for pensioners, are stable and that annuity payments can be honoured notwithstanding the risks in retirement incomes. Two main areas of impact are claimed: i) 'Informing EU policy discussions: cross-European decumulation policies and value-for-money issues'. For example, the report to the EU Directorate General for Financial Stability, Financial Services and Capital Markets Union (DG FISMA) 'extensively cites' the work of the researchers Cannon and Tonks into the annuity markets. ii)Informing UK policy debates. For example, informing the work of the UK financial regulators through commissioned studies and invitations to respond from the Financial Services Authority (FCA) about understanding the annuity markets; commissioned assessment from the UK HM Treasury department; cited in the Labour Party commissioned study by the Pensions Institute in the Independent Review of Retirement Income, 2016 which looked at retirement income in defined contribution schemes and how to boost these.	1) **Influencing EU policy discussions**: the work is cited in key documents. 2) **Informing UK policy debates:** for example, the evidence informed the work of financial regulators (the FCA), and the UK government HM Treasury and the Independent Review of Retirement Income. 3)**Engagement with policymakers:** the team received commissioned studies and invitations to respond from key bodies, for example the FSA, and HM Treasury.

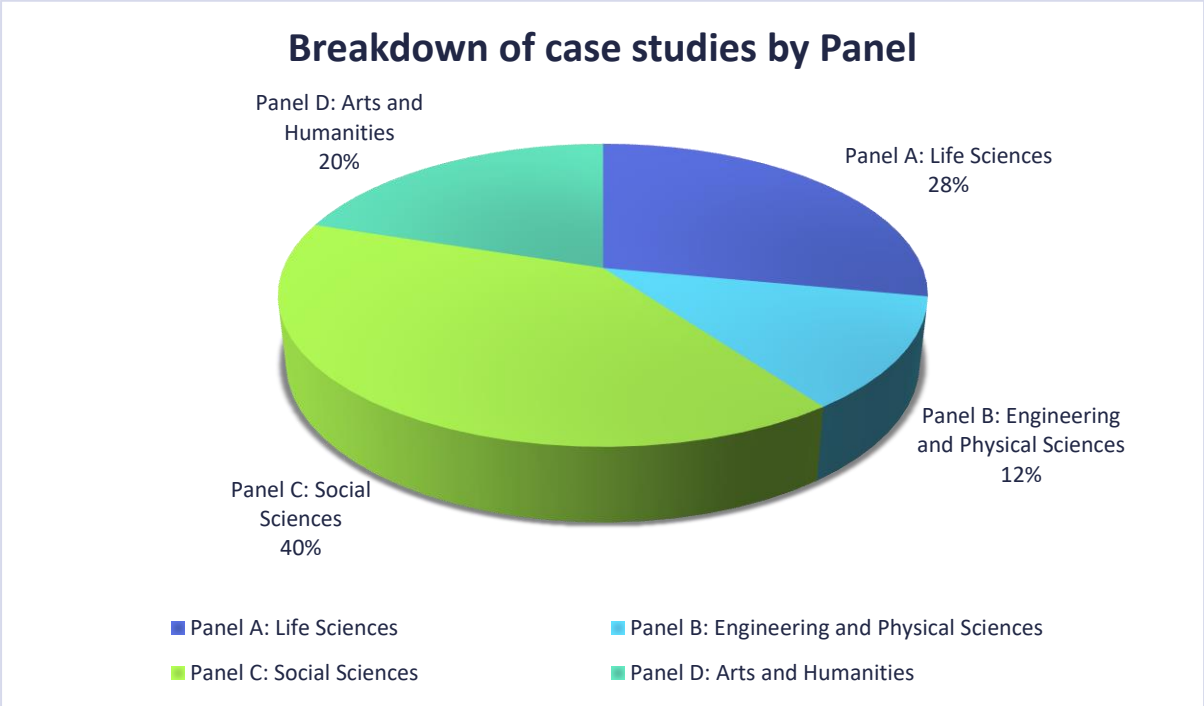
Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Designing socially intelligent adaptive systems to inform commercial AI development and engage the public in debates over human-robot interaction (31) University of Hertfordshire **Panel B:** Computer Science and Informatics **Funder:** European Commission **Collaborations:** New York University, University of Bremen; Maastrict University, Zuyd University of Applied Sciences Heelenthe, Netherlands, University of Technology Troyes, France and MADoPA Centre Expert Rosieres France. **Location:** The following countries are mentioned for the broader impact: UK, US, Japan, France, Netherlands. The impact for the work on robots for older people was undertaken in the UK, with social media/media impacts with potential for global reach. **Research methods:** Designing adaptive systems - development of a quantifiable measure of user empowerment, research into scenarios using assistive robotics. **Participation/engagement with older people:** through partnerships with cultural institutions and proactive media engagement, the researchers sought to engage the public in what socially interactive robots can and cannot do, their debate engaging around 100,000 people and sustained media engagement that reached an audience of millions.	The research team have developed the design of robots that 'interact with humans and each other in a more socially intelligent way' and influenced the first international standards which regulate how personal care robots are designed. Specific impacts in this multi-strand case study include: i) Development of the Care-O-bot, a mobile robot assistant used to support independent living for older people. The design involved scenarios and took account of ethical and safety considerations. ii)Industry commercial development of Care-O-bot 4 has taken place, leading to 'more than £2.1m in sales and rental revenue' and in addition winning industry awards. iii)Contributed to the British Standards Institute (BSI) Technical Committee AMT/10 on Robotics, including the 'first robot safety requirements for personal care robots and to the ethical design and application of robots and robotic systems' (31).	1)**Collaborative research:** including a range of academic and cultural institution partners. 2)**Public engagement:** undertook a programme of engagement to raise public awareness and explore the ethical and technical challenges of human/robot interaction. 3) **Social media/media coverage:** the University of Hertfordshire's Robot House received in-depth coverage in a BBC One series on ageing Holding Back the Years (2018), BBC Three documentary Can Robots Love Us? (2017; also receiving 307,507 YouTube, 2,800 likes, 611 comments), BBC News (2015), The Guardian (2016) and CNet.com (2017). 4)**Industry development:** generated revenue of more than £2.1m in sales and rental revenue and won awards for the Care-O-bot 4. 5)**Influenced standards development:** for example, invited to join the British Standards Institute (BSI) Technical Committee AMT/10 on Robotics.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
Age-friendly cities: improving the lives of older people in urban communities through research (32) The University of Manchester **Panel C:** Sociology **Funders:** Southway Housing Trust, The Big Lottery Community Fund, Manchester City Councils, European Research Council, Economic and Social Research Council UK **Collaborations:** (a) International collaboration through the ESRC-funded International Network on Population Ageing and Urbanisation (INPAU) (2012-2015) with policymakers and academics from Europe, North America and Asia; (b) City of Manchester was a key participant of INPAU and the first UK member of the World Health Organization Global Network of Age-Friendly Cities; (c) Manchester City Council (MCC) and Southway Housing (the biggest social landlord in South Manchester). **Location:** Communities in Greater Manchester; local and regional government; international (Global North and South). **Research methods:** Surveys, co-production, participatory research, empirical comparative research. **Participation/engagement with older people:** Older people were co-researchers. Many of the co-researchers have continued to engage in community initiatives after the project completion, e.g. one co-researcher is now the chair of Great Manchester Older Peoples' Network; co-researchers established a successful campaign to reinstate a bus route; and this demonstrated the need for a local forum to address the needs of older people.	The research addressed major social trends of an ageing population in the context of increased urbanisation and the social exclusion of older people. The research has contributed to the policies and strategies to develop age-friendly communities at a local, regional and international level. The case study describes impact in three main areas: 1. New models of collaborative engagement were developed, leading to increased involvement in shaping communities. For example, older people were involved as co-researchers in Manchester where they were involved in producing guidance documents and a film describing their experience of being co-researchers and the impact on their lives and benefits for their communities. These outputs were used by organisations (such as the World Health Organization (WHO)). 2. Influenced policy and practice through developing innovative partnerships at local and regional level. For example, the team are involved at a local level in developing policies on ageing with partners. Phillipson was involved as author of the first age-friendly policy strategy for the Greater Manchester region, 2017. The WHO designated Greater Manchester as the UK's first age-friendly city. 3. Influenced international policy debate on developing age-friendly cities in the Global North and South. For example, . Greater Manchester achieved the maximum rating from the European Innovation Partnership for Active and Healthy Ageing; Mayor Andy Burnham represented the UK at a high-level international forum on the silver economy where he spoke about the active and healthy ageing within cities and cited the research.	1) **Collaborative with older people:** developed new models for engagement with increased involvement. 2) **Partnerships:** developed partnerships at the level of local and regional government e.g. city agencies became partners in research. 3) **Influenced international policy debate:** e.g. maximum rating from the European Innovation Partnership for Active and Healthy Ageing, involvement at international forum.

Impact case study	Overview of impact	Main routes/mechanisms associated with the impact
New tools to identify older people at risk of malnutrition and improve their nutritional care (33) Bournemouth University **Panel A:** Allied Health Professions, Dentistry, Nursing and Pharmacy **Funder:** Burdett Trust for Nursing **Collaborations:** 1)NHS – formal partners (named in grant): Southern Health Foundation NHS Trust, Wessex- AHSN's Nutrition in Older People Programme (formal partners, named in grant). 2)Faculty of Health Sciences, University of Southampton (formal partner, named in grant). 3) Patients - some of the research was in conjunction with the Patients Association (PA). 4) Local authorities and social care - worked in partnership with users, beneficiaries and those involved in the delivery of care. **Location:** UK and international. **Research methods:** Survey, Empirical study, Prospective process evaluation, Cross-sectional study, Qualitative. **Participation/engagement with older people:** the research included working in partnership with users (older people) and organisations representing patient perspectives e.g. the Patients Association. People with dementia living in care homes participated in the research by wearing devices to measure energy needs. The toolkit can be used directly by older people if they choose to download it; or via helplines for older people (e.g. the Scottish the Malnutrition Advice Line and Age Scotland advice line).	The research team developed new tools and models that enabled earlier identification of those at risk of malnutrition. This led to changes in the delivery of person-centred care for those most at risk. Families, carers and care homes have used the tools nationally. For practitioners the tools and models have informed national training frameworks to improve care delivery. In addition, during the COVID-19 pandemic the early identification models supported those at risk of malnutrition.	1)**Collaborative:** with NHS, local authorities, social care and patients. 2)**Policy influence:** e.g. recommended use of Patients Association Nutrition Checklist by British Dietetic Association; incorporated into Eat Well Age Well Scottish national training and guidelines, Malnutrition Advice Line and Age Scotland advice line; underpins Welsh Government's best practice guidance. Tools embedded into national stakeholder policy documents and resources. 3)**Informed training:** embedded in the 'National Dementia Training Standards Framework', 2018; checklist incorporated into Scottish national training; training toolkit for persons with dementia consisting of a workbook, film and guide. 4)**Resources to support use**: freely available toolkit, wrote guidelines for using the nutrition checklist, checklist designed and adapted to use by patients and carers and professionals which enabled use during the pandemic; produced a guide for family carers of people with dementia providing practical advice during the pandemic. 5)**Active dissemination**: reaching key audiences to bring about impact via a freely available toolkit on the Bournemouth University website, a range of national organisations included on their websites (Health Education England, Dementia UK). 6)**Implementation into practice**: incorporated into use in health and social care and in the community.

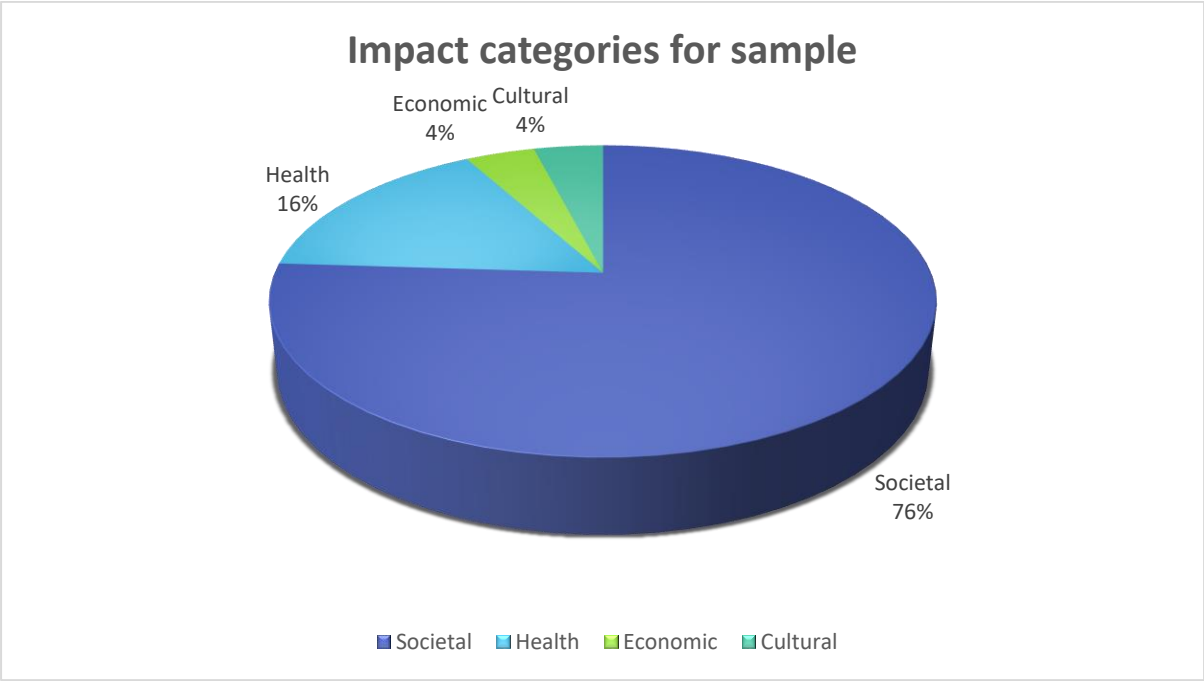
5.2 Impact case studies by Panel

Chart C: REF 2021 breakdown of case studies by Panel



5.3 Impact categories in the sample

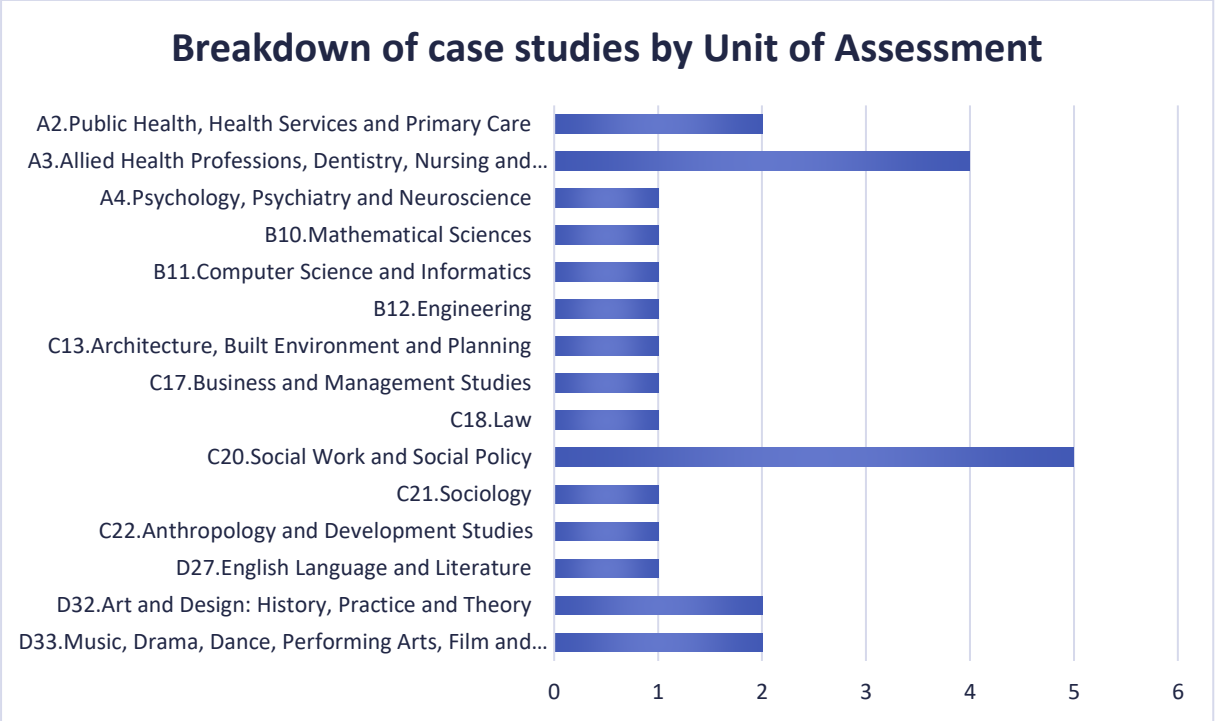
Chart D: REF 2021 breakdown of the impact categories in the sample.



5.4 Breakdown by Panel and Unit of Assessment

Table H provides a breakdown of the impact case studies in the sample by Panel and Unit of Assessment.

Table H: REF 2021 breakdown of the case studies by Panel and Unit of Assessment



5.3 Centres/Groups involved in the case study

Within the sample, 40% (10 out of 25) case studies refer to the work of a group or centre. These predominantly focus on university-wide inter-disciplinary collaborative research groups with a themed focus, for example, the University of Keele Arts and Humanities Research Council funded Late-Life Creativity research network and the Manchester Institute for Collaborative Research on Ageing (MICRA). Wider regional networks are also referred to, such as the Engineering and Physical Sciences Research Council Liverpool Centre for Mathematics in Healthcare involving collaborations with NHS clinicians and international centres such as the collaboration with the Africa Population and Health Research Centre, Nairobi with the University of Southampton.

As with the REF 2014 analysis, institutions were not required to provide information about the groups/centres involved in the work underpinning the case study and therefore the information described is limited in scope.

5.4 Is there evidence of collaborative work – other higher education institutions, organisations?

All of the case studies in the sample 100% (25 out of 25) indicate some degree of collaborative involvement. Whilst there is some collaboration documented within all of the case studies, in some cases collaborative work appears to be more limited with the case study mainly describing the work of a specific individual or team.

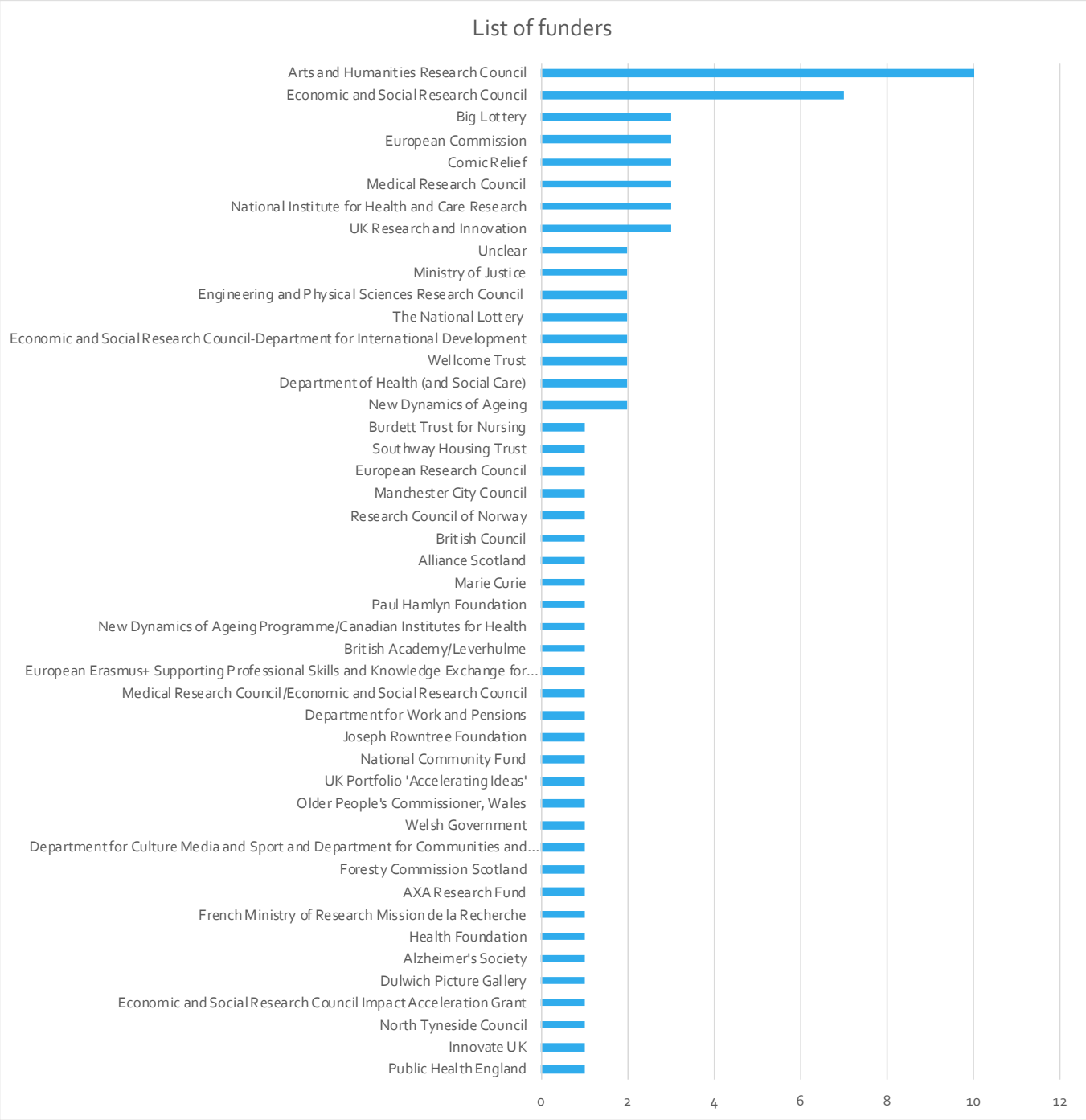
As with the REF 2014 analysis an extensive range of partnerships and collaborations are mentioned – local, regional, national and international and across sectors. Collaborations with other higher education institutions are a common feature as part of the research funding and for the related publications. Other collaborations involve partnership working with the NHS, health and social care, industry, local and national government and international networks to potentially facilitate closer application of research into practice and to address specific needs.

5.5 Who are the main research funders?

Building upon the REF 2014 submission for REF 2021, institutions were asked to provide information about funders. These changes have meant that for all case studies there is some level of detail about the funders. In some cases some of the funding information is partial. Information about grants and funding is in most cases given within the case study and also forms some of the detailed information in the additional contextual information provided as part of the REF 2021 database. For the purposes of analysis, we worked with the information in the case study and referred to the REF 2021 database information to identify details about funders.

As with the REF 2014 analysis the sample reveals a diversity range of funders. There is significant variation in the size of funding awarded depending on the research context and funding route. In the majority of cases, the case study is based upon a series of awards. In some instances specific funding to support impact from the research is referred to, for example the use of Economic and Social Research Council Impact Acceleration Account.

Chart E: REF 2021 information about the range of funders in the sample case studies.



5.6 What is the indicative timescale between research and impact?

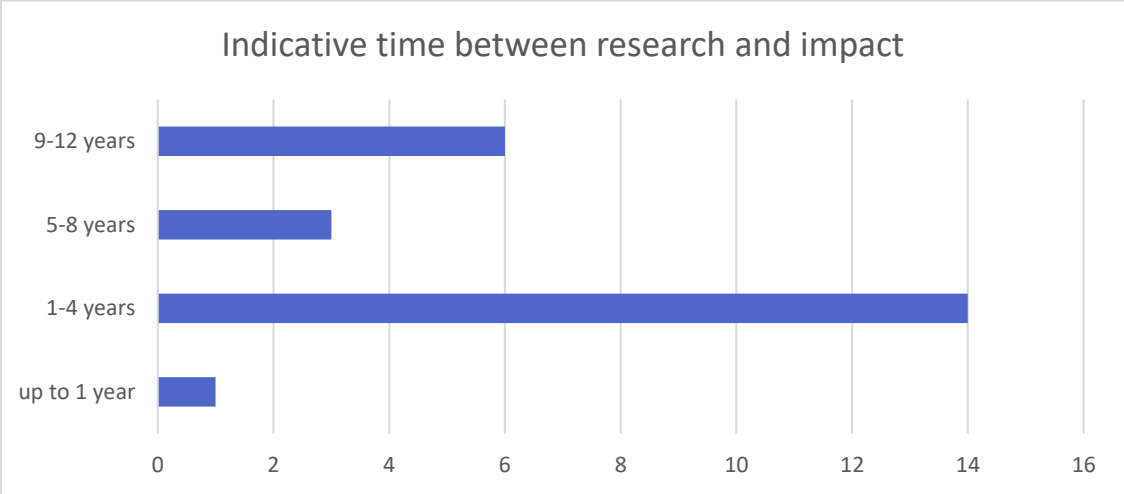
We recorded the time period between the start of research and the impact commencing for each of the 25 case studies. This information drew upon the dates recorded in the case study as well as reviewing the impact section of the case study. The timescales extracted are for indicative purposes only as without further discussion with case study authors it was not possible to be precise about timescales. For example, it may be possible that other smaller, incremental impacts may have taken place which do not form part of the REF submission. The time period

eligibility criteria prescribed by REF 2021 for the impact period (2013-2020) may also have affected what is included.

Nonetheless, the timescales that we were able to identify adds to the knowledge about the complexities involved in determining how long it takes between research and impact, identifying what time points to consider and to some of the commentary regarding when rapid research evidence may accelerate use into practice or policy in response to societal needs, for example the Covid-19 pandemic (34–36).

Chart F provides information for 24 of the case studies. We excluded data from one continuing impact case study as the research and impacts are on-going from the REF 2014 submission. Chart F illustrates that for the majority of case studies 56% (14 out of 25) the timescale between research and impact is between 1-4 years. The average timescale in the sample is 5.0 years.

Chart F: REF 2021 breakdown of the indicative timescales between the start of the research and the impact commencing



5.7 How many research studies are presented?

The case studies in the sample are evenly distributed in terms of number of studies undertaken. A total of 52% (13 out of 25) are based upon a small number of different studies (up to 3), with 48% (12 out of 25) based upon a larger number of different research studies (4 plus). This is broadly similar to the REF 2014 analysis where 50% (25 out of 50) of the case studies were based upon a small number of different studies. Within the current sample it has been possible to identify the number of case studies, whereas previously in REF 2014, 16% (8 out of 50) were coded as not known.

As before, it is useful to note that the number of research studies does not give an indication of the size of each impact case study, for example one impact case study may refer to a large scale, collaborative European study or one impact case study may refer to a local study.

Table I: REF 2021 number of research studies in the case study

The case study is based upon a small number of different research studies (up to 3)	13
The case study is based upon a large number of different research studies (4 plus)	12

5.8 Is the research based on the work of a team or an individual?

Table J shows that predominantly impact case studies are based upon the work of teams which mirrors the REF 2014 analysis.

Table J: REF 2021 case studies by teams and individuals

The work of researchers/research projects/research teams which include those beyond the submitting institution	23
The work of one research team	2
The work of one researcher	0
The work of one researcher but references show them as part of a team	0

5.9 Do the case studies show international reach?

A total of 76% (19 out of 25) of the impact case studies refer to an international dimension to the research. This is similar to the REF 2014 analysis which identified 74% (37 out of 50) of impact case studies with an international component. The international reach of the impact covers a broad spectrum with examples in Table G highlighting international research collaborations, international funders, whole case studies focused on international impact to those which describe raising public awareness and specific dissemination activities at an international level.

5.10 What subject areas are represented?

The REF 2021 database assigns up to three research subject areas to each case study. As in the REF 2014 analysis, a striking feature of the case studies is that they span a range of subject areas and cover all subject Panels in the REF.

Within the sample case studies, subjects represented are as follows:

Table K: REF 2021 subject areas represented

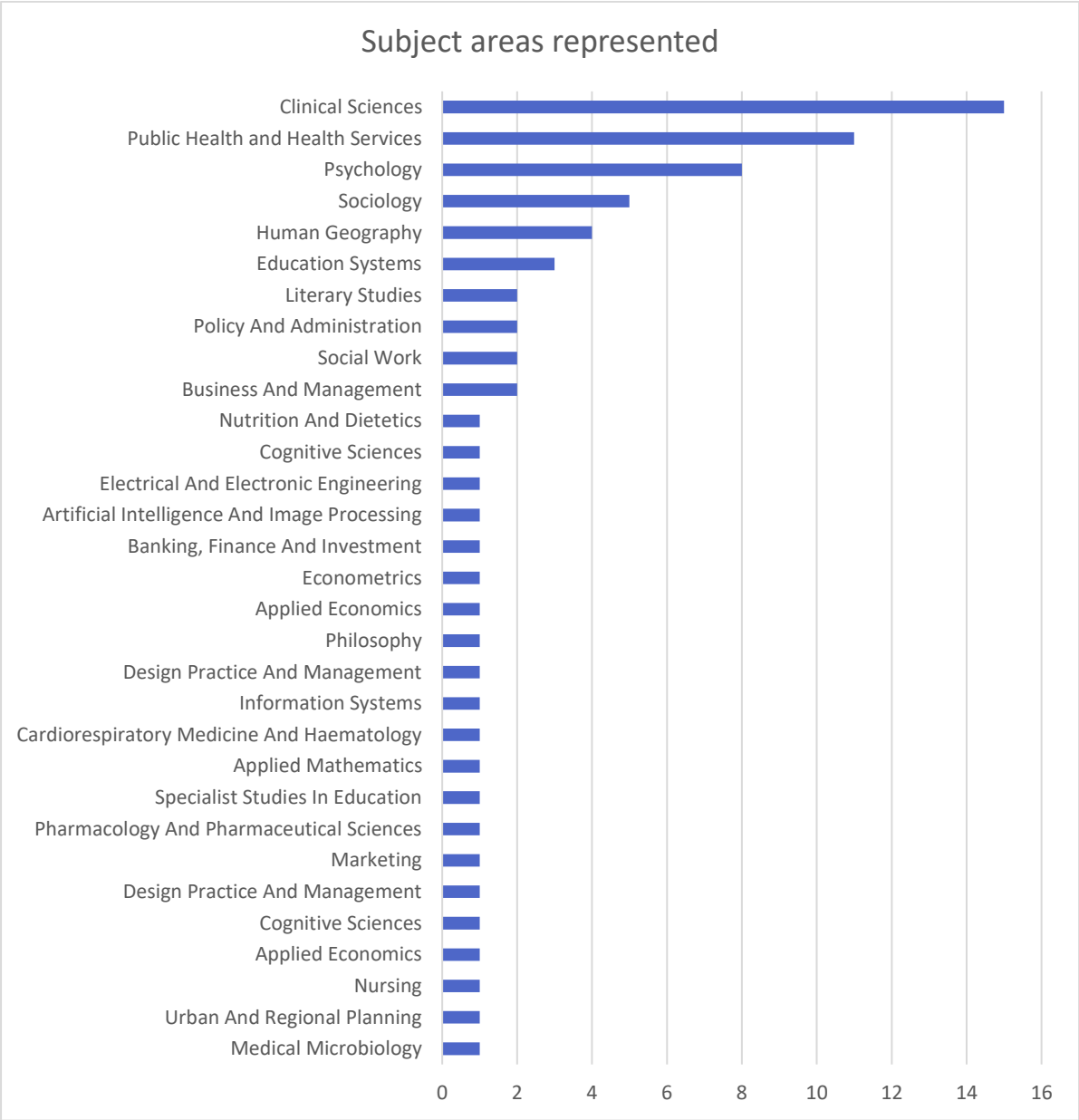


Table L below provides a breakdown of the research subject areas by Panel. This may help to illuminate the contribution of social science-based approaches within the life and health sciences, for example, the subject areas represented as part of Panel A include, business and management, sociology, policy and administration, literary studies and education systems. It also emphasises the multi and inter-disciplinary involvement within research teams.

Table L: REF 2021 breakdown of research subject areas by Panel

	Panel A	Panel B	Panel C	Panel D	Totals
Clinical Sciences	5	1	6	3	15
Medical Microbiology	1				1
Public Health and Health Services	1	2	7	1	11

Urban And Regional Planning			1		1
Human Geography		1	2	1	4
Nursing			1		1
Applied Economics			1		1
Psychology	2	2	3	1	8
Cognitive Sciences			1		1
Design Practice And Management			1		1
Business And Management	1		1		2
Marketing			1		1
Social Work		1	1		2
Sociology	2	1	2		5
Pharmacology And Pharmaceutical Sciences			1		1
Policy And Administration	1	1			2
Education Systems	3				3
Specialist Studies In Education	1				1
Applied Mathematics	1				1
Cardiorespiratory Medicine And Haematology	1				1
Literary Studies	1			1	2
Information Systems	1				1
Design Practice And Management	1				1
Philosophy				1	1
Applied Economics				1	1
Econometrics				1	1
Banking, Finance And Investment				1	1
Artificial Intelligence And Image Processing				1	1
Electrical And Electronic Engineering				1	1
Cognitive Sciences				1	1
Nutrition And Dietetics				1	1
	Panel A	**Panel B**	**Panel C**	**Panel D**	**Total**
Totals	**22**	**9**	**29**	**15**	**75**

5.11 Is there evidence of participation and engagement with older people?

A total of 52% (13 out of 25) of the case studies make explicit reference to the participation and engagement of older people in the research process. In the REF 2014 analysis involvement was identified in 32% (16 out of 50) of the case studies.

In 20% (5 out of 25) of the analysed case studies older people were described as being involved as research participants with no further detail provided. In 12% (3 out of 25) there may have been some involvement with older people but it is not

explicitly described in the case study. In 16% (4 out of 25) the involvement of older people is not mentioned.

For REF 2021, the purposive sampling provided an opportunity to illuminate specific aspects related to the lives of older people and later life and the contributions of older people provided one aspect of this. There may have been other case studies in REF 2014 which highlight the participation and involvement of older people which did not emerge in the random sample used. In addition, for both REF 2014 and REF 2021 where the involvement of older people is not visible or clearly described may reflect how the case study is written rather than it not being a part of the research process.

Overall, as in the REF 2014 there are some examples of innovative practice, including user-centred design, co-design of research and interventions, participatory performances, creation of cultural artefacts, international collaborations and experiences of marginalised groups.

Intergenerational activities are specifically highlighted in 8% (2 out of 25) of the case studies. The previous REF 2014 analysis noted 6% (3 out of 50).

The role of advocacy and charitable groups is also mentioned in some case studies, for example, Age UK, Alzheimer's Society, Marie Curie, Age Cymru (older peoples' charity in Wales), Help and Care UK, the Patients Association, HelpAge Kenya, the University of the Third Age (and their equivalents in Italy and Slovenia).

It is also possible to identify other networks and organisations which facilitate engagement, public debate and policy, for example, the Centre for Ageing Better, Business in the Community and the New Dynamics of Ageing Programme.

5.12 What routes/mechanisms have been used to achieve impact?

Mechanisms and facilitators to bring about impact can be multi-faceted and are not necessarily prescriptive. Impact can take time, there may be direct and indirect factors involved, impact may not be linear nor predictable or guaranteed. The previous analyses of the impact case studies submitted as part of the REF 2014 exercise showcased the diversity of research impacts, highlighting that there were 3,709 unique pathways to impact across the dataset of 6,679 impact case studies (8).

Whilst it is not possible to attribute direct causal effects to specific mechanisms, the enabling mechanisms identified within the REF2021 sample align with other work that has examined research impact which emphasise factors which appear to be conducive towards impact such as: strong and ongoing links with policymakers, knowledge translation, membership of guideline development groups and the development and delivery of training packages. For example, Boulding et al (2020) emphasise acknowledgement of local 'unintended' impacts, collaborations, engagement activities and use of a variety of dissemination channels (7; 37; 38).

As Table G illustrates, the sample case studies provide examples of how impact emerged using a wide variety of mechanisms. There are examples of non-linear and unpredictable elements, which contribute towards impact within the case studies. How a range of enabling mechanisms can accumulate and optimise impacts has been identified. Active efforts made by researchers and teams provide some indication of the commitment, perseverance and enthusiasm of researchers to generating impact from research (7; 38).

6.Discussion

The availability of the REF 2021 database enables us to build upon and extend the BSG REF 2014 evaluation. Whilst there are limitations to using this dataset for analysis purposes the case studies provide a tremendous resource for analysis purposes.

As before, there are some limitations to using the database in this way. Impact case studies are understandably described in predominantly positive terms to highlight impact arising from research. The higher weighting given to impact in REF 2021, accounting for 25% of the overall scores may also potentially distort the selection of case studies submitted. Impact was assessed highly across the REF with 87.2% of impact case studies achieving a combined 4*/3* level, an increase from 84% in REF 2014 (7,39).

'Ageing research' is not a predefined category within the submitted case studies and determining what constitutes an impact case study related to ageing and later life requires discussion and judgment. Perspectives may differ. The report by Technopolis, a data mining company employed by Research England to examine the outputs submitted to REF including an analysis of the term 'ageing' also notes the lack of an established categorisation for ageing and gerontology research which can encompass a range of subject disciplines (40). The findings from the Technopolis report (2022) identify some commonalities with the analysis of impact in highlighting that ageing and gerontology research spans multiple disciplines and units of assessment in the REF. In addition, the report notes that half of the peer-reviewed outputs in ageing and gerontology were associated with international collaboration (40). These findings mirror those of this impact analysis which show that the disciplinary breadth of ageing research spans 33 out of 34 units of assessment. In addition, in the sample of case studies, over three-quarters (76%) refer to an international dimension to the research.

Our work shows how terminology used to describe ageing research is ever changing. This reflects changing societal norms and researcher knowledge. It also reflects how disciplinary involvement in ageing research is also shifting which may mean that it is ever inclusive of other disciplines alongside social sciences. One example is the greater engagement of the social sciences in health-related research, which has been stimulated to some extent by research funders.

Following the publication of the results of REF 2021, a series of REF Panel Overview Reports were produced which describe how the assessment was carried out and commentary about the assessment and the research in their subject areas (4). Within the REF Panel Overview Reports, ageing is specifically referred to in the REF Main Panel Reports for Panel A, C and D. The report for Panel A (life sciences and health) refers to research which focuses upon ageing and dementia within nursing research. Other units of assessment in Panel A describe case studies which address a range of clinical conditions which can be associated with older age, such as, dementia, stroke and also responding to the needs of carers (36). The report for

Panel C (social sciences) refers to ageing and gerontology in several of the units of assessment with reference to an ageing population and subject areas covering ageing and pensions, dementia, death and dying, social care, rehabilitation, carers and loneliness. The Panel C report also comments upon observing co-produced work with specific communities such as people with dementia and excluded communities (41). The report for Panel D (arts and humanities) comments on notable examples of inter-disciplinary research in response to specific challenges including an ageing society (42).

Whilst we used a broadly similar methodology to the REF 2014 analysis, we made significant enhancements to the keyword search and adopted a purposive sampling approach to the analysis of the sub-set of impact case studies instead of random sampling. These changes have meant that it is not possible to make direct comparisons with the findings from the REF 2014 and REF 2021 analyses. Instead overall commonalities and trends have been identified.

Within the REF 2021 analysis, a total of 572 impact case studies related to ageing and later life were identified. This represents 8.4% of 6,781 case studies submitted overall to REF 2021. A striking feature is that all Panels and 33 out of 34 Units of Assessment include ageing related impact case studies. As with REF 2014 there is considerable disciplinary breadth.

The analysis identified that impact case studies related to ageing and later life were predominantly in Panel A (life sciences and health). An exploration of the impact categories showed that both 'health' (40%) and 'societal' (37%) were the most commonly used categories used. A breakdown of the research subject areas by Panel in the sample set revealed that the subject areas represented as part of Panel A included business and management, sociology, policy and administration, literary studies and education systems. These findings may help to identify the contribution of social science-based approaches within life sciences and health.

Societal changes are reflected in the REF 2021 impact case studies, and, as noted in the REF 2021 Panel Reports, there are examples of case studies contributing to the work on Covid-19 in the submissions highlighting the value of research evidence and the speed with which relevant evidence can be adopted (36). In relation to ageing related case studies and Covid-19 there are examples addressing implications and interventions in hospitals, care homes and the community.

The analysis of the sub-set of 25 impact case studies identifies similar themes to the REF 2014 analysis:

The impacts described are broad and diverse and vary across the panels.

The underpinning research is multi-disciplinary and inter-disciplinary.

Impact is underpinned by collaborative and partnership activities including a wide range of stakeholders.

The role of organisations and agencies concerned with older people remains pivotal.

Institutions have also been strengthening impact case study submissions since REF 2014 and this may include international impact. For example, over three quarters (76%) of the impact case studies refer to an international dimension to the research. In addition, over a half (52%) of the impact case studies make explicit reference to the participation and engagement of older people in the research process.
It is apparent that ageing and gerontology research spans a broad range of subject areas, for example within the sample there is evidence about extending working lives, pensions and income in retirement, age-friendly environments, domestic violence and abuse, housing and later life, rehabilitation and management of long-term conditions, assistive care, cultural heritage and facilitating creative expression for wellbeing.

The expanded number of examples of the contributions that older people are continuing to make whether this is through co-design in health and social care research, to informing changes in local communities, to preserving cultural history and sharing experiences is to be welcomed .

7.Conclusion

The findings highlight an extensive and comprehensive range of impact case studies related to ageing and later life. The range of Panels and Units of Assessment which feature research illuminating some aspect of age, ageing and later life is impressive.

We encourage BSG and other bodies concerned with ageing research to explore the impact case studies submitted to REF 2021 further.

For the BSG we specifically recommend a focus upon how the body of knowledge and experience possessed by the social sciences can work with and enhance the research and subsequent impact created through cross and interdisciplinary endeavours.

Future analyses of case studies would be further enhanced with some direct dialogue with the case study authors to enable a richer understanding of context and intentions and to understand the nuances and complexities involved in creating research impact.

The richness and variety that the case studies illustrate serve to demonstrate how research can benefit the lives of older people and their families and carers. The REF impact case studies are to be celebrated. We must also acknowledge that as REF provides a selective snapshot of impact, there is a continuing need to create, value and nurture a range of impacts whether these are submitted as future impact case studies or not.

We hope this report will initiate an invitation for further dialogue across disciplinary areas and with stakeholders. The overview of ageing research across the case studies indicates that major challenges and opportunities presented by age and ageing in society benefit from collaborations which bring together multiple perspectives.

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8 Appendices

Appendix A: Key words used
Appendix B: Search by centres/ groups
Appendix C: Key word search by combination of term
Appendix D: Proforma for case study analysis REF 2021
Appendix E: List of case studies included in the sample analysis

Appendix A: Key words used

Appendix A describes the keywords tested in the REF 2014 analysis and the additional keywords introduced to help us identify relevant impact case studies. The additional keywords are highlighted in yellow.

Keywords	Suggested prefix/term to use for search	REF 2021 search	Comments
Accessible design or inclusive design	(accessible OR inclusive) AND design AND ("agei*" OR "elder*")	31	Limited with "agei*" OR "elder*" Reduced from 593
Aged	"aged"	593	
Ageing	"agei*"	292	
Ageism	"agei*"	[as above]	
Aging	aging	89	
Age discrimination	"age discrimination"	4	
age-friendly environments	"age-friendly" AND "enviro*"	11	
ageing in place	"agei*" AND "in place"	59	
“ageing workforce”	"ageing work*"	4	
Alzheimer’s	"alzheimer*"	87	
“arts and ageing”	"art*" AND "agei*"	129	
assisted living	"assist*" AND "living"	227	
“assistive technologies”	"assist* tech*"	35	
“assistive technology”	"assist* tech*"	[as above]	
bed blocker	"bed" AND "block*"	14	
Carer	"carer*"	386	
“care homes”	"care home*"	140	
creativity and ageing	"creativ*" AND " agei*"	42	
cognitive decline	"cognitive" AND "decline"	31	
cognitive frailty	"cognitive" AND "frail*"	4	
Community or primary care or secondary care	(community OR primary OR secondary) AND care AND ("agei*" OR "elder*")	129	Limited with "agei*" OR "elder*"). Reduced from 1311
“cultural gerontology”	"cultur*" AND "gero*"	9	
delayed discharge	"delay*" AND "discharge*"	23	
dementia	"dementia"	181	
economically inactive	"economic*" AND "inactiv*"	20	
Elderly	"elder*"	210	
“end of life care”	"end of life" AND "car*"	62	
“environment and ageing”	"enviro*" AND "agei*"	90	
“environmental gerontology”	"enviro*" AND "gero*"	15	

Frailty	"frail*"	49	
“frail older people”	"frail*" AND "old*"	25	
Geriatric	"geriatric"	29	
gerontology	"gero*"	42	
home and ageing	"home" AND "agei*"	73	
hospital	"hospital*" AND ("agei*" OR "elder*")	102	Limited with "agei*" OR "elder*". Reduced from 1172.
inequalities	"inequalit*" AND ("agei*" OR "elder*")	41	Limited with "agei*" OR "elder*". Reduced from 580.
intergenerational	"intergeneration*"	129	
“late life creativity”	"late life" AND "creativ*"	3	
“late style”	"late style"	4	
“later life”	"late*" AND "life"	806	
lifecourse	"lifecourse"	18	
Life-course	"Life-course"	58	
Lifespan	"lifespan"	69	
Longevity	"longevity"	101	
Mature	"mature"	88	
neurodegenerative	"neurodegener*"	44	
“nursing homes”	"nurs*" AND "home*"	195	
Old	"old*" AND ("agei*" OR "elder*")	182	Limited with "agei*" OR "elder*". Reduced from 1497.
Older	"old*"	[as above]	
Oldest old	"Oldest old"	3	
“old age”	"old*" AND "age"	434	
“older adults”	"old*" AND "adult*"	359	
older employees	"old*" AND "employee*"	82	
older self-employed	"old*" AND "self-employ*"	3	
“older people”	"old*" AND "people"	902	
“older workers”	"old*" AND "worker*"	158	
palliative care	"palliative" AND "care"	75	
pensions	"pension*"	162	
pensioners	"pensioner*"	21	
“population ageing”	"population" AND "agei*"	116	
“post retirement”	"post" AND "retir*"	33	
Respite care	respite AND care	9	
retirement	"retir*"	192	

“retirement housing” OR “extra care housing”	("retirement" OR "extra care") AND "hous*"	21	
“retirement housing” OR “extra care housing” OR sheltered	("retirement" OR "extra care") AND "hous*" OR "shelter*"	99	
Retirement living/ extra care/ assisted living/	(retirement OR "extra care" OR "assist*") AND living	235	
“rural ageing”	"rural" AND "agei*"	17	
Senior	"senior*" AND "citizen*	197	Limited with "citizen*" – 197 Reduced from 2135
Social gerontology	"social" AND "gero*"	18	
Technology	"tech*" AND ("agei*" OR "elder*")	209	Limited with "agei*" OR "elder*". Reduced from 4004
Telecare	"telecare"	2	
Telehealth	"telehealth"	14	
transhumanism	"transhumanism"	1	
Transport	"transport*" AND ("agei*" OR "elder*")	36	Limited with "agei*" OR "elder*". Reduced from 747
Transitions	"transition*" AND ("agei*" OR "elder*")	31	Limited with "agei*" OR "elder*". Reduced from 737
“urban ageing”	"urban*" AND "agei*"	29	

Appendix B: Search by centres/ groups

Centre/groups	Term(s) to use for search	REF 2021 search
Ageing Research Centres listed on the BSG website (as at 12.03.23)		
Ageing Futures Research Group University of Bristol	"Ageing Futures Research Group"	0
Ageing Well Research Group Glasgow Caledonian University	"Ageing Well Research Group"	0
ARK Ageing Programme Queen's University Belfast and Ulster University	"ARK Ageing Programme"	0
Association of Dementia Studies University of Worcester	"Association of Dementia Studies"	3
Aston Research Centre for Healthy Ageing - Ageing Lives Cluster Aston University	"Aston Research Centre for Healthy Ageing"	1
Centre for Ageing and Biographical Studies The Open University	"Centre for Ageing and Biographical Studies"	0
Centre for Ageing and Dementia Research Swansea University, Bangor University and Aberystwyth University	"Centre for Ageing and Dementia Research"	0
Centre for Ageing and Mental Health University of Chester	"Centre for Ageing and Mental Health"	0
Centre for Ageing Population Studies University College London	"Centre for Ageing Population Studies"	0
Centre for Ageing Research Lancaster University	"Centre for Ageing Research"	0
Centre for Chronic Illness and Ageing University of Greenwich	"Centre for Chronic Illness and Ageing"	1
Centre for Environment, Dementia and Ageing Research University of Stirling	"Centre for Environment Dementia and Ageing"	0
Centre for Global Ageing King's College London	"Centre for Global Ageing"	0
Centre for Innovative Ageing University of Swansea	"Centre for Innovative Ageing"	0

Centre for Research on Ageing University of Southampton	"Centre for Research on Ageing"	0
Centre for Research on Ageing and Gender University of Surrey	"Centre for Research on Ageing and Gender"	0
Dementia Studies University of Bradford	"Dementia Studies"	8*
DSDC Wales/Ageing and Dementia Bangor University	"DSDC"	0
DSDC Wales Research Centre Bangor University	"DSDC Wales Research Centre"	0
Healthy Ageing and Care Oxford Brookes University	"Healthy Ageing and Care"	0
Healthy Ageing Research Group University of Lincoln	"Healthy Ageing Research Group"	0
Healthy Lifespan Institute University of Sheffield	"Healthy Lifespan Institute"	0
Institute for Ageing, Theme – Ageing: economic and social impact Newcastle University	"Institute for Ageing"	1
Institute of Environment, Health and Societies – Theme – Ageing Studies Brunel University London	"Institute of Environment Health and Societies"	0
Institute of Gerontology King's College London	"Institute of Gerontology"	0
Keele Centre for Ageing University of Keele	"Keele Centre for Ageing"	0
Manchester Institute for Collaborative Research on Ageing (MICRA) University of Manchester	"Manchester Institute for Collaborative Research on Ageing"	1
NICOLA (Northern Ireland Cohort for the Longitudinal Study of Ageing) Queen's University Belfast	"Northern Ireland Cohort for the Longitudinal Study of Ageing"	0
NIHR Health and Social Care Workforce Research Unit King's College London	"Health and Social Care Workforce Research Unit"	1
The Geller Institute of Ageing and Memory University of West London	"The Geller Institute of Ageing and Memory"	0

The Oxford Institute of Population Ageing University of Oxford	"The Oxford Institute of Population Ageing"	0
UK SPINE Universities of Oxford, Dundee, Birmingham, Medicines Discovery Catapult, Francis Crick Institute and EMBL-EBI/Open Targets	"UK SPINE"	0
Other searches		
KT-EQUAL Collaboration led by University of Sheffield	"KT-EQUAL"	1
New Dynamics of Ageing Programme University of Sheffield	"New Dynamics of Ageing Programme"	2
Personal Social Services Research Unit (PSSRU) University of Kent	"Personal Social Services Research Unit" OR "PSSRU"	6
What Works Centre for Ageing Better	"What Works Centre for Ageing Better"	1

* N.B. The search term is broad and does not reflect the no. of ICS submitted by the Dementia Studies Centre, University of Bradford (=1).

Appendix C: Key word search by combination of terms

Combined search terms	Totals
"aged" OR "agei*" OR aging OR "age discrimination" OR "ageing work*" OR "alzheimer*" OR "assist* tech*" OR "carer*" OR "care home*" OR "dementia" OR "elder*" OR "frail*" OR "geriatric" OR "gero*" OR "intergeneration*" OR "late style" OR "lifecourse" OR "life-course" OR "lifespan" OR "longevity" OR "mature" OR "neurodegener*" OR "Oldest old" OR "pension*" OR "pensioner*" OR "retir*" OR "telecare" OR "telehealth" OR "transhumanism" OR ("late*" AND "life") OR ("age-friendly" AND "enviro*") OR ("agei*" AND "in place") OR ("art*" AND "agei*") OR ("assist*" AND living) OR (bed AND "block*") OR ("creativ*" AND "agei*") OR (cognitive AND decline) OR (cognitive AND "frail*") OR ("cultur*" AND "gero*") OR ("delay*" AND "discharge*") OR ("economic*" AND "inactiv*") OR ("end of life" AND "car*") OR ("enviro*" AND "agei*") OR ("enviro*" AND "gero*") OR ("frail*" AND "old*") OR (home AND "agei*") OR ("late life" AND "creativ*") OR ("nurs*" AND "home*") OR ("old*" AND "age") OR ("old*" AND "adult*")	2717
("old*" AND "employee*") OR ("old*" AND "self-employ*") OR ("old*" AND "people") OR ("old*" AND "worker*") OR ("palliative" AND "care") OR ("population" AND "agei*") OR ("post" AND "retir*") OR (respite AND care) OR ("rural" AND "agei*") OR ("social" AND "gero*") OR ("urban*" AND "agei*")	1092
(accessible OR inclusive) AND design AND ("agei*" OR "elder*")	31
(community OR primary OR secondary) AND care AND ("agei*" OR "elder*")	129
"hospital*" AND ("agei*" OR "elder*")	102
"inequalit*" AND ("agei*" OR "elder*")	41
"old*" AND ("agei*" OR "elder*")	182
("retirement" OR "extra care") AND "hous*"	21
("retirement" OR "extra care") AND "hous*" OR "shelter*"	99
(retirement OR "extra care" OR "assist*") AND living	235
"senior*" AND "citizen*"	197
"tech*" AND ("agei*" OR "elder*")	209
"transport*" AND ("agei*" OR "elder*")	36
"transition*" AND ("agei*" OR "elder*")	31
"Association of Dementia Studies" OR "Aston Research Centre for Healthy Ageing" OR "Centre for Chronic Illness and Ageing" OR "Dementia Studies" OR "Institute for Ageing" OR "Manchester Institute for Collaborative Research on Ageing" OR "Health and Social Care Workforce Research Unit" OR "KT-EQUAL" OR "New Dynamics of Ageing Programme" OR "Personal Social Services Research Unit" OR "PSSRU" OR "What Works Centre for Ageing Better"	22

Appendix D: Proforma for case study analysis REF 2021

Panel and UoA
HEI
Title
Centre/Group
Is this a continuing impact case study?
Is there evidence of collaborative work – other HEIs, Organisations
Outline of what impact is claimed
Who are the main research funders?
Is the case study based on: ● The work of one researcher ● The work of one researcher but references indicate that they were part of a team ● The work of one research team ● The work of researchers/research projects/research teams which include those beyond the submitting institution
Is the case study based on: Small number of different studies (up to three) Large number of studies (4 plus)
What are the dates for research and impact? Add date of the underpinning research period Add date of the impact period Add timescale between research and impact.
What research subject areas are represented?
Location of the impact
Does the case study show international reach?
Is there evidence of user participation and engagement?
Impact Category Categories from REF database Political Legal Health Cultural Technological

Societal Economic Environmental
What routes/mechanisms are associated with the impact?
Research methodologies described, e.g., RCT

Appendix E: List of case studies included in the sample analysis

Title	**Institution**	**Unit of assessment**	**URL**
Shaping national policy to reduce the rate of COVID-19 transmission in care homes	University College London	Public Health, Health Services and Primary Care	https://results2021.ref.ac.uk/impact/d83de44b-dd7a-4e8e-8b0f-48cf919e1847?page=1
Integrating health, care services and housing: innovative and improved ways of helping older people	University of Northumbria at Newcastle	Allied Health Professions, Dentistry, Nursing and Pharmacy	https://results2021.ref.ac.uk/impact/828c27b8-99d3-49a9-be6c-f0618a3206d9?page=1
Using art-based interventions to improve the well-being of older adults with dementia and their carers	Canterbury Christ Church University	Psychology, Psychiatry and Neuroscience	https://results2021.ref.ac.uk/impact/485f90f8-fa19-4322-8c8f-670b2a1a75b9?page=1
Improving the safe use of medicines for older people living in care homes across the UK	The University of Leeds	Allied Health Professions, Dentistry, Nursing and Pharmacy	https://results2021.ref.ac.uk/impact/a431428d-37fd-4394-9f60-364f1a35729c?page=1
LifeCurve software for assessing functional decline	University of Newcastle upon Tyne	Public Health, Health Services and Primary Care	https://results2021.ref.ac.uk/impact/7c567bba-ffd8-4df9-b953-3bd67025da7b?page=1
Falls prevention amongst older people: Increased reach and further impact of interventions, uptake and adherence	The University of Manchester	Allied Health Professions, Dentistry, Nursing and Pharmacy	https://results2021.ref.ac.uk/impact/be3d165d-5c1b-4bc4-9d84-6c7d20b1146a?page=1
New tools to identify older people at risk of malnutrition and improve their nutritional care	Bournemouth University	Allied Health Professions, Dentistry, Nursing and Pharmacy	https://results2021.ref.ac.uk/impact/06a31f21-2a1c-462b-81d4-5b218f7b2256?page=1

Title	**Institution**	**Unit of assessment**	**URL**
Enhancing older people's accessibility and activity in unfamiliar places through age-friendly planning	Kingston University	Engineering	https://results2021.ref.ac.uk/impact/b131aa64-d621-43fa-8dc2-0eb1bb5e7c47?page=1
Mathematical modelling of an aneurysm sealing system triggers patient safety policy that withdraws surgical practice from the NHS	The University of Liverpool	Mathematical Sciences	https://results2021.ref.ac.uk/impact/7169a44e-65e9-4ebb-8553-48117c758ae4?page=1
Designing socially intelligent adaptive systems to inform commercial AI development and engage the public in debates over human-robot interaction	University of Hertfordshire	Computer Science and Informatics	https://results2021.ref.ac.uk/impact/79fe151d-123d-495e-b1c8-a109c1226d56?page=1

Title	**Institution**	**Unit of assessment**	**URL**
Improving the lives of older people in Kenya	University of Southampton	Social Work and Social Policy	https://results2021.ref.ac.uk/impact/ed4e5431-41c4-4022-b12a-0198b3a91b6a?page=1
Housing & Later Life: improving older people's access to housing-related information and advice through policy and service reforms in France	Swansea University / Prifysgol Abertawe	Social Work and Social Policy	https://results2021.ref.ac.uk/impact/0e79723c-2edb-4119-8a25-a9e5cd928cfd?page=1
Putting long-term care in low and middle income countries on the global policy agenda	The University of East Anglia	Anthropology and Development Studies	https://results2021.ref.ac.uk/impact/08134ec2-7834-4fee-aaf5-aed89788fe86?page=1
Accessing the outdoors: improving public policy on green spaces to benefit health and wellbeing	University of Edinburgh/Heriot-Watt University (Edinburgh Strategic Alliance) (joint submission)	Architecture, Built Environment and Planning	https://results2021.ref.ac.uk/impact/480666df-f7af-46e0-b650-7386e0ef0762?page=1
Developing the Fuller Working Lives Policy Agenda through Research-Based Professional Advice, Expert Testimony, and Stakeholder Engagement	The University of Kent	Social Work and Social Policy	https://results2021.ref.ac.uk/impact/fa5ab1de-76df-4a32-b546-0927e51269e5?page=1
Ages and Stages: The Place of Theatre in the Lives of Older People	University of Keele	Social Work and Social Policy	https://results2021.ref.ac.uk/impact/4bf7d714-f10a-48b1-b915-42a5a248a6b6?page=1
Retirement income research informs UK and European policy debates	University of Bristol	Business and Management Studies	https://results2021.ref.ac.uk/impact/8f78135e-9329-4991-a798-ec221b88dfae?page=1
Age-friendly cities: improving the lives of older people in urban communities through research	The University of Manchester	Sociology	https://results2021.ref.ac.uk/impact/88a8eac6-7b78-4ad7-91f9-c912b81f8e2d?page=1
Changing hearts and minds: How the stories of older LGBT people are changing attitudes, education and care	Bournemouth University	Social Work and Social Policy	https://results2021.ref.ac.uk/impact/3e8c1e92-abb4-472f-a76b-cd1eaebc49ed?page=1
The Dewis Choice Initiative: Transforming the response to domestic violence and abuse in later life	Aberystwyth University / Prifysgol Aberystwyth	Law	https://results2021.ref.ac.uk/impact/45165906-c80a-41ca-a281-4d5d63085435?page=1

Title	**Institution**	**Unit of assessment**	**URL**
Silver Shoppers: designing a better supermarket experience for the older customer	University of Southampton	Art and Design: History, Practice and Theory	https://results2021.ref.ac.uk/impact/557b0b5c-

			b321-4fde-977e-db06458a57af?page=1
CINAGE: Creative Approaches to the Active Ageing Agenda through Film and Theatre-making	Leeds Beckett University	Music, Drama, Dance, Performing Arts, Film and Screen Studies	https://results2021.ref.ac.uk/impact/302f8d3e-c143-4a7b-975e-93665f177a52?page=1
Co-Creating Cultural Heritage in Post-War Italy: enhancing older people's wellbeing through digital inclusion and intergenerational collaboration	Oxford Brookes University	Music, Drama, Dance, Performing Arts, Film and Screen Studies	https://results2021.ref.ac.uk/impact/a3a08781-cde0-4efb-a601-c7d67ee64f83?page=1
Lab4Living: design to promote quality of life and wellbeing	Sheffield Hallam University	Art and Design: History, Practice and Theory	https://results2021.ref.ac.uk/impact/1026e101-ff0f-4a89-abee-3956650838c8?page=1
Ageing as Embodied Time: Using Literature to Understand and Improve Wellbeing in Older Age	The University of Warwick	English Language and Literature	https://results2021.ref.ac.uk/impact/da3b066a-d2b1-4738-ba0c-85b86427d987?page=1