Unit of Assessment 3 – Allied Health Professions, Dentistry, Nursing and Pharmacy

Institution	Evidence
University of Dundee	We have undertaken analyses based on the information available to us but this has not revealed any meaningful trends to inform the review.
Medical Research Scotland	Medical Research Scotland appreciates the opportunity to participate but are not able to provide the requested data.
University of Aberdeen	The University of Aberdeen has not made any submissions to UoA 3 or its predecessors in previous research assessment exercises, so we do not offer any metrics. The University's Dental School was founded during the REF2014 assessment period, and a very small number of research active staff were included in the institutional clinical medicine submission. Given the focus of the new Dental School at the time, this reflected more accurately the clinical and research environment in which the dental clinicians were undertaken research. Our approach for REF2021 is likely to remain the same – presentation of dental clinical research to a unit of assessment that attracts the medium level subject weighting would be financially detrimental to the University. For the clinical dentistry work within this submission, we would argue for a higher subject weighting or the inclusion of this type of research within UoA 1 Clinical Medicine.
University of the Highlands and Islands	**1. Changes in research practice in areas covered by Unit of Assessment 3.** Health Research at UHI did not commence until 2006, so there was no return to RAEs before that date and no activity at all until after 2006.

	In RAE2008, the 2.0 FTE category A staff were actually returned to Biomedical Sciences, so again, there was no activity directly related to this UoA. The material change to our activities started in 2008, when our Biomedical Scientists (Pharmacology and Immunology) formally joined with our Rural Health and Wellbeing team under the umbrella of "Health Research". Simultaneously, we linked up with a valued partner (Robert Gordon University) for our submission to REF2014. The majority of the submission to REF2014 (UoA3) related to our Pharmacology/Pharmacy research (4.2 FTE), but Rural Health and Wellbeing was also represented (1.0FTE). The second substantial change to our research team occurred in 2017, when a Department of Nursing (now Nursing and Midwifery) transferred en masse to the University of the Highlands and Islands from the University of Stirling. This brought with it 10 FTEs in a range of disciplines, from Public Health to Research associated with Nursing and Nurse Practice. At the same time, our Rural Health and Wellbeing and Biomedical Sciences teams were substantially invested in, particularly with respect to Physical Activity, Nutrition, Social Science and Pharmacology/Immunology. **2. Changes in the balance of research activity between constituent discipline areas covered by Unit of Assessment 3.** 1997/8: 0 researchers in UoA3 2007/8: 0 researchers in UoA3 2017/18: 22 FTEs in UoA3 (5 nursing, 3 physical activity, 1 nutrition, 6 public health, 7 pharmacology/immunology/toxicology). **3. Changes in levels of support required by academics active in research in the disciplines covered by Unit of Assessment 3, specifically in terms of**

	• Research Assistants or equivalents; 1997/8: 0 researchers in UoA3 2007/8: 0 researchers in UoA3 2017/18: 12 PDRAs across all disciplines • Specialist support staff such as technicians 1997/8: 0 researchers in UoA3 2007/8: 0 researchers in UoA3 2017/18: 4FTE specialist technicians to support physical activity (1), nutrition and pharmacology/immunology/toxicology research (3) • Access to specialist research equipment, infrastructure and facilities. 1997/8: 0 researchers in UoA3 2007/8: 0 researchers in UoA3 2017/18: £4m of specialist equipment, primarily to support the Pharmacology research. In addition, £1m per annum is spent on office and laboratory space associated with our UoA3 research team. **4. Changes in the volume (ie number and/or size) of research grants won per researcher active in the disciplines covered by Unit of Assessment 3.** 1997/8: 0 researchers in UoA3 2007/8: 0 researchers in UoA3 2017/18: Research spend associated with grant income for this year was £2.278m (£100k per FTE).
University of Stirling	**1. Changes in research practice in areas covered by Unit of Assessment 3.** In the area of health research there has been a change in the expectations on researchers in ensuring compliance is met in several areas including:

	• NHS R&D approval – including the research passport process (researchers must hold one to conduct research in the health service), securing occupational health clearance, Disclosure checks, etc. before research can be undertaken in the NHS; • Data protection – GDPR has introduced a contractual/SLA approach to data sharing; NHS has 'Caldicott Principles' to be complied with. There are a growing number of trials related to interventions rather than a purely qualitative or quantitative studies. These studies now often involve a requirement to be multi-site studies spread across several heath board/trust areas, which introduces additional compliance issues to which resources must be allocated in order to resolve. There is also a greater focus on work with international collaborators. International projects bring with them an additional layer of complexity and scope and many research projects now require dedicated project managers with the relevant skills to coordinate activities and communications across multiple institutions, time zones and cultures. Changes in the type and volume of data recorded in studies also requires skilled or specifically trained staff to manage and maintain ever growing and complex data sets. **2. Changes in the balance of research activity between constituent discipline areas covered by Unit of Assessment 3.** **3. Changes in levels of support required by academics active in research in the disciplines covered by Unit of Assessment 3, specifically in terms of** • **Research Assistants or equivalents;**

	• **Specialist support staff such as technicians;** • **Access to specialist research equipment, infrastructure and facilities.** **4. Changes in the volume (i.e. number and/or size) of research grants won per researcher active in the disciplines covered by Unit of Assessment 2.** Year Researcher (count) No Awards Sum of awards (£000's) Avg Award Value (£000's) Avg Award per researcher (£000's) 1997-98 1 1 26 26 26 2007-08 13 21 1566 76 120 2017-18 12 16 1210 76 100 **5. Any other sources of evidence that might illustrate any changes in the absolute costs of research activity in the disciplines covered by Unit of Assessment 2 since 1997-98.** Institutional TRAC returns show that the recovery of full economic costs at the institution is in steady decline. In the year 2011/2 TRAC recovery of full economic cost on research was 71.9% in the latest TRAC return of 2017/8 this is sitting at 60.7%.
Queen	As a general point, it has been quite difficult to provide evidence of the various changes described in the

Margaret University	questionnaire over a period of 20 years, as to do so would rely on the experience of staff who have been engaged in similar types of research over that 20 year period. This is particularly the case in respect of the first three questions, where the responses are largely qualitative. In relation to the information requested in question 4, this has also proven difficult to access, as typically this detail and type of information is only held for a period of six years. A further general point is that, when looking at subject weightings for research in general, a reasonable sense check for SFC would be to look also at the transparent approach to costing for teaching (TRAC(T)) data that it collects at subject level to inform prices for teaching funding. There will clearly be different costs between research and teaching which means that there would not be a direct comparison, but it might be expected that there would be some correlation, at least in relative terms. One specific point in relation to UoA3 is that technical support, infrastructure and facilities are essential to the research in this area that is particularly focused on rehabilitation and physical activity. There is a need for greater investment in this kind of support and for the contemporaneous development of the facilities available to ensure competitiveness of research. This is an area of concern as funding becomes more streamlined into specific areas and more targeted on areas of research intensification.
Glasgow Caledonian University	Due to the complexity of the data in question and the time frame defined, it is extremely challenging to obtain meaningful, reliable and statistically significant figures for the information you have requested. Moreover, given that our research pool is relatively small, I am not sure how useful this will be to your overall review. However, we would like to make the following observations: • Overall, the University's spending on research has increased but how much of this increase will be reflected by one Unit over another is difficult to ascertain since much of the costs are centralised. Furthermore, the definitions and parameters of the Units of Assessments have also changed so we are not comparing like

	with like. • For for UoA3 at GCU, within the given time-frame the volume, value and nature of the funding bodies has changed significantly i.e. there are many more active researchers, winning higher value grants bids from funders such as NIHR and the European Commission. Although it is not necessarily true that income equates to cost, the increased ambition of the research being carried out results in an equivalent increase in cost for staff, specialist research equipment, infrastructure and facilities. • Within UoA3 there has been an increase in the volume and location of trials which brings about an increase in associated costs. • Likewise, UoA3 has seen a marked increase in the direct involvement of patients and the overall application of research at a social level (employing aspects of health economics, social innovation etc.) which also leads to increased associated costs that hardly existed in previous activities. • The University will not be submitting for UoA 4. No UoA has been submitted for Psychology since 2001 and there has been a significant decline in personnel across the subject area in terms of teaching staff as well as researchers. • There have been no submissions for UoA 2.
University of Strathclyde	**1. Changes in research practice in areas covered by Unit of Assessment 3.** Research practice in UoA3 areas has changed considerably since 1997-1998 with a corresponding substantial shift in the funding base. In place of individualised research with a single laboratory/PI there is now a considerable degree of multi-disciplinarity to approach major consensus topics, with expertise required across and beyond an individual unit of assessment and often globally. Research has also become service and excellence-centre driven because no single unit can cover all the elements of a modern multi-faceted project. The conventional model of one institute or department holding all of the facilities to undertake its research scope is long gone. Pooling initiatives and accessing specialist facilities and expertise is commonplace but expensive. Examples include

	accessing the SCAPA facilities - £6k /day; and utilising SULSA centres of excellence with specialist kits and personnel, at several thousand pounds per experiment. Major items of specialist equipment now commonly require specialist preventive maintenance contracts - these are relatively new and are more expensive than was required for less complex equipment used previously. Specific pieces of work are also franchised out to specialist commercial companies or supported by high cost facility charges. Greater emphasis on impact necessitates a stronger translational and clinical element for UoA3 . Even in projects which appear to require less specialised equipment and clinical elements, for example those focused on medical data, current approaches dictate a much greater requirement for advanced computing facilities and data access. Furthermore, enhanced compliance requirements to fulfil ever tightening legislation processes and GMP research necessitates ethical approval in all aspects including gaining of licences, approval, GMP statistical experts etc. These elements indicate that to produce high quality research outputs that are compliant with all the needs of the subject matter and obtain impact requires far more significant and costly human resource, outsourcing, access to specialist facilities than historically for this discipline or for comparative disciplines. Our research can also require access to in vivo models. To buy animals, comply with ethical and licencing terms, and buy out the time of specialist technicians, animal costs are becoming prohibitive and many projects are failing to maximise impact as we cannot justify undertaking the final steps to produce industry-ready research packages for attracting the funding required for clinical trial. A high-quality paper in this discipline also now requires much greater longitudinal studies, and advanced methods, techniques and dimensions than others. This incurs costs and resource in terms of people, consumables and legislative costs.

	One further relatively new development in clinical and population health research has increased our costs relative to some other disciplines, namely recent requirements for patient and public involvement in research (developed largely in the last five years and follows established frameworks such as INVOLVE). This has brought new and additional costs of staff time plus costs of patient and public time and training. **2. Changes in the balance of research activity between constituent discipline areas covered by Unit of Assessment 3.** For REF2014, our substantive return to UoA3 was from our Institute of Pharmacy and Biomedical Sciences, i.e. with a focus on the Pharmacy and Biomedical element of the UoA. For REF2021, we are considering the potential make-up of the submission. However, there is a wide range of activity aligned to this UoA across the sector and in this context we very much welcome SFC's review of changes in the cost of undertaking research in UoA3. What is certainly the case is that the areas covered by UoA3 include a range of multidisciplinary research areas - taking ideas from initial concept to implementation using the entire pathway of treatment needed to develop medicines or technology, to scoping and implementation – which is more costly than single subject research, requiring a plethora of divergent expertise and critical mass. To offer such research capacity to students also requires flexibility and availability of staff from the relevant disciplines, from PIs to have strategic oversight, to PDRAs to offer hands on support. One cannot be an expert in everything required but requires expertise from the relevant sector which in turn requires core expertise with time to offer to such endeavours. Examples include: development of next generation laser plasma radiation sources for radiotherapy- required biology, translational cancer research, in vivo expertise, physics, radiobiology, engineering, psychological sciences, and radiochemistry

	Many of our CDTs are multidisciplinary- require chemistry, physics, biomedical sciences, pharmacy, bioengineering, NPL, other Universities, external partners etc. Digital health comprising computing, pharmacy, business, psychological sciences, electrical engineering, biomedical engineering and many external stake holders. The net effect of this is that the areas covered by UoA3 are not only broad through the definition of UoA3, but require a much wider breadth of expertise than is immediately apparent to meet the needs of research users. **3. Changes in levels of support required by academics active in research in the disciplines covered by Unit of Assessment 3, specifically in terms of** **• Research Assistants or equivalents;** **• Specialist support staff such as technicians;** **• Access to specialist research equipment, infrastructure and facilities.** The balance of research group composition has changed from a richness in technical support and PDRAs, to a greater concentration of PIs and PhD students. This results from the difficulty in securing sufficient grant income to allow for experienced PDRAs and technicians. Many of the funding streams for Professions allied to health research are charity funding with grant limits, which does not allow for appointment of experienced PDRAs. This has a real impact in terms of research continuity, support for students and the PIs who increasingly take on hands-on supervisory roles detracting from their time to write grants, papers, develop ideas, think strategically and be inventive. Technicians provide support as above, but also offer continuity, as PDRAs and students move on: lab technicians have specialist knowledge around methodologies and kit, specialist activities and knowhow from labs that can be shared with collaborators or partners and can also horizon scan and be tech-ready for new innovations so we stay at the top of the innovation curve.

Few Universities have the luxury of dedicated technicians to be experts in specialist equipment which is key to innovation and excellence. The approach we are forced to take in this area is for PIs to put in bids for kit without the benefit of dedicated technicians deployed to maintain the kit and share the expertise. This takes time from PIs, and results in sub optimal access to kit. The alternative model of deploying technicians results in a model for access to kit which is very expensive and prohibits early career researchers being able to undertake pockets of research activity due to the costs. Sir Mark Walport's comment (related to large scale infrastructure) of equipment coming with "batteries not included" is applicable here.

PhD students in our UoA3 area also require around £12k/annum consumables on average which is much higher than many other UoAs. Self-funded students often cannot afford this so cannot access specialist facilities, limiting their project scope. Thus, we need to ensure that to maintain our excellence we have a funding model which enables us to cover these additional costs which are unique to these disciplines.

4. Changes in the volume (i.e. number and/or size) of research grants won per researcher active in the disciplines covered by Unit of Assessment 3.

Total Awarded	# Awards	Average per award	Academic FTE	Total Awarded/FTE	# Awards/FTE
1997-98			No equivalent data available from this time period.		
2007-08	£2,896,226	23	£125,923	78.1	£37,083.56	0.29
2017-18	£5,055,535	39	£129,629	58.6	£86,271.93	0.67

	5. Any other sources of evidence that might illustrate any changes in the absolute costs of research activity in the disciplines covered by Unit of Assessment 3 since 1997-98. In our response to the REG consultation in late 2013 we highlighted the importance of maintaining competitiveness with funding in HEFCE [Research England] funded institutions. In this context, we strongly encouraged SFC to adopt a cost weighting of 1.6 for REF2014 UoA 3 Allied Health Professions, Dentistry, Nursing and Pharmacy (which brought together four RAE2008 UoAs, three of which were assigned a weight of 1.6 by HEFCE). It has remained the case that UoA3 is considered 'high cost' (weighting of 1.6) in England but 'intermediate cost' (weighting of 1.2) in Scotland. Against this backdrop, and taking into account the wider context whereby the HEFCE Board considered evidence put forward for UoA4 (Psychology, Psychiatry and Neuroscience) which was described as 'spanning subject areas of varying costs' and subsequently determined that allocations should be calculated based on the UoA being comprised of around 40% high cost (weighted 1.6) and 60% intermediate cost (weighted 1.3) activity, resulting in an average cost weight of 1.42. In the absence of more nuanced cost categories, this would seem to be a reasonable approach to take for UoAs where there is clearly significant variation in the type (and cost) of research being undertaken for the various contributing disciplines. It is fully understood that SFC will not wish to have too many variations in cost weightings across the UoAs, however we would consider UoA3 to be a particular special case. Against this backdrop, although SFC opted not to change the weighting for UoA3 for REG allocations flowing following REF2014, we would suggest key considerations as part of the current review are to: • If dual-weighting approaches were to be introduced for UoAs which span subjects with different cost bases, then this should also be applied to UoA3. • Take into account the competitiveness of funding in Scotland vs that available to institutions pursuing comparable research in England in the context that Scottish universities are competing for funding.

University of Glasgow	**1. Changes in research practice in areas covered by Unit of Assessment 3.** There has been little change in research practice for this area. There is limited direct clinical research and our research is still mostly public health and laboratory-based research. **2. Changes in the balance of research activity between constituent discipline areas covered by Unit of Assessment 3.** There has been change in UoA3 from being only dentistry previously to now including dentistry, nursing and human nutrition research. **3. Changes in levels of support required by academics active in research in the disciplines covered by Unit of Assessment 3, specifically in terms of** • Research Assistants or equivalents; • Specialist support staff such as technicians; • Access to specialist research equipment, infrastructure and facilities. **4. Changes in the volume (ie number and/or size) of research grants won per researcher active in the disciplines covered by Unit of Assessment 3.** **5. Any other sources of evidence that might illustrate any changes in the absolute costs of research activity in the disciplines covered by Unit of Assessment 3 since 1997-98.** The value of awards announced in a particular year, as requested in section 4, can be quite uneven due to the total grant award being counted in the year it was awarded. A more informative indicator would be the research income (expenditure) for each year as is reported to HESA.

	Furthermore, as outlined in your introductory paragraph, the subject weightings are intended to reflect the varying cost of carrying out research in different disciplines and as such, the weightings need to take account of the relative cost of research between disciplines rather than changes within a discipline over time. Clinical medicine (UoA1) is the most relevant highly weighted discipline. Clearly, the cost of research within UoA3 remains relatively low compared to UoA1. **The University of Glasgow therefore believes that the current cost weightings remain appropriate and reflect the relative cost of undertaking research between the discipline groups.**