

Institution: University of Plymouth

Unit of Assessment: 3

1. Unit context and structure, research and impact strategy

Context

The University of Plymouth's UoA3 submission is built on the diversity and plurality of its Faculty of Health (FoH). We were **the first post-1992 university to run a medical school by itself** and the **first to establish a dental school**. Our range of health and social care research and education is amongst the broadest in the UK (4,500 professionals in research and training across 60 programmes). UoA3 is our largest health return and forms the core of our interdisciplinary applied health research; it includes research from our Schools of Medicine, Dentistry, Health Professions and Nursing & Midwifery. We are a modern university with a proud tradition of teaching and of civic commitment to our region. We are also an ambitious institution in health delivery and research. The strategy that we have developed over this REF period has been backed by major investment since 2014 to build excellence in research in UoA3, evidenced by **a >£50M infrastructure spend** (£24M dedicated to Health Professions and Nursing); **a 310% rise in award income; a >360% rise in PGR completions**; our diverse **outputs covering the breadth of the health landscape**; and by our four impact case studies that reach from health policy to health measurement, ophthalmology to orthotics.

The unit comprises 52 category A staff (**48.01 FTE; a 38% rise** since 2014). Since 2020, research in UoA3 is supported through the **Plymouth Institute of Health and Care Research (PIHR).** PIHR is a strategic institutional investment to coordinate health research across the university, and to improve health in areas that are priorities for our local, relatively deprived, urban-rural and maritime populations and for similar communities worldwide. PIHR will add value by enabling and accelerating research, supporting new and productive collaborations across disciples, and multiplying the volume, quality, and impact of our work. It enables **an interlocking matrix** where the applied health research (UoA1) and our psychology research (UoA4), as well as with health-related research in other Faculties and National and International partners.

Barrier-free collaborative working has crystalized the research activity of UoA3 around four principal themes:

(1) Developing and evaluating health and social care interventions

- (2) E-Health and technology
- (3) Measurement of health
- (4) Dental research

The four UoA3 themes (detailed below) provide critical mass and a focused research direction in a supportive environment. They allow us to address the key issues impacting the health environment of the South West and which hold relevance for UK and International health and social care provision. Our unique position as a peninsula, with a stable and ageing rural population, has provided the basis for leading national programmes with partners that have complementary profiles, and for securing strong relations with regional health and social care collaborators. Examples include the impact of rurality on health and social care access, and the measurement and management of symptoms pertinent to an ageing population such as those associated with dementia, diabetes and cataracts, and randomised trials requiring diverse populations.

Key achievements this REF period:

• Four-fold increase in award income from £3.2M to >£18.5M.

• 38% expansion in researchers from 34.9 to 48.01 FTE, with a greater proportion of senior researchers.



- >Four-fold increase in PGR awards (from 14 to 62).
- National and International collaboration with world-leading research programmes (PenARC, EPIC, TARS, e-coachER, STRENGTHEN, D-PACT, PARTNERS2, ENGAGER).

• New research programmes in low-middle income countries such as Nepal (**Marsden**), Philippines (**Nasser**), Malaysia (**Nasser**) and Uganda (**Rupert Jones**). These build local research capacity, e.g., our work in the Philippines has trained 25 junior research fellows as part of a research residency and funded 5 ongoing research projects.

Current position and developments since 2014

Our 2014 UoA3 submission followed a period of change at the University of Plymouth, including the separation of Plymouth's Medical and Dental Schools from a joint venture with Exeter University. Recent consolidation into one Faculty and the evolution of a single strategic health-related research institute has led to re-alignment of our UoA3 submission around four themes in applied health research; as a result, some basic and translational research which was included in UoA3 in 2014 is now integrated into a sister unit (UoA1; Fern, Fejer, Affourtit, Upton) and all dental research is consolidated in UoA3. This aligns our submission with the new PIHR structure. In 2020 PIHR incorporated the work of the Institute of Translational and Stratified Medicine (ITSMed) and the Institute of Health and Community (IHC) which were featured in the 2014 submission.

Research themes

These provide a coherent structure for the development of inter-disciplinary research and the growth of its members from doctoral level to independent principal investigators. Each theme hosts regular seminars which provide forums to critically discuss and debate current, past and potential projects. External speaker programmes of leading researchers highlight best research practice, inspire staff, and help develop fruitful collaborations. Research discussion forums and networking opportunities, hosted by PIHR, foster the generation of research ideas, interdisciplinary collaborative working and the submission of grant applications.

Theme 1. Developing and Evaluating Health and Social Care Interventions

This UoA3 theme focuses on interventions designed to tackle societal and global health challengesparticularly health inequality - in the areas of primary care, mental health and wellbeing, lifestyle risk & health, and integrated care. Intervention development is informed by routes that include: public and patient input (PPI) in the prioritisation of research questions; understanding the lived experience of health and disease through qualitative work; clinical stakeholder engagement; systematic and scoping reviews of literature; translation of lab-based research into the underpinning causes of disability; and evidence-based behaviour change techniques. The feasibility, piloting and definitive evaluation of these interventions is supported by a UKCRC-registered clinical trials unit (PenCTU), NIHR Research Design Service (SW RDS); NIHR Applied Research Collaboration (PenARC), Faculty Medical Statistics team, NIHR Clinical Research Network (CRN), and an Academic Health Science Network (SW AHSN).

Within the theme there is expertise and support through a variety of PPI and researcher-led activities, including how to develop acceptable and feasible interventions, which are evidence and theorybased. The aim is to support change in behaviour, thoughts and emotions, leading to improved wellbeing. There is also sharing of research methods, for example, to optimise recruitment, data capture & monitoring and data analysis. Three particular areas of expertise have been developed: rehabilitation, health promotion, and interprofessional person-centred care.

In the field of maternal health, **Shawe** and **Maslin** direct a programme optimising pregnancy in obesity and bariatric surgery (**PREPARE**). Working with an International team, guidelines have been developed and nationally two pilot cohort studies are underway (BDA funded). **Freeman, Shawe,** and **Hosking** are undertaking a trial to improve pelvic pain after childbirth (RfPB funded). Rehabilitation intervention development (**Freeman, Marsden**) has involved people with progressive neurological conditions, with a particular focus on the area of impaired mobility and balance (e.g., **BRIMS, SUMS, COGEX, VERMIS**). Health promotion work (**Tailor, Thompson, Callaghan, Axford**)



includes interventions to improve the health and well-being of offenders (STRENGTHEN) and the prevention and management of addictive substances (e.g., TARS), testing theory-driven interventions delivered by Health Coaches, and interventions for children, young people and parents. Work on complex care for those with complex needs (Byng), funded through three NIHR programmes, has resulted in development of a practical method for delivering coordinated and person-centred care for offenders (ENGAGER), individuals with psychosis (PARTNERS2) and people with dementia and their carers (D-PACT). We also investigate inequalities and inequities in dementia care (Banerjee), including the ESRC/NIHR-funded DETERMIND programme which explores variations in outcomes by gender and ethnicity; a large multicentre NIHR HTA-funded RCT of mirtazapine versus placebo for agitation in dementia (SYMBAD); and a novel programme evaluating the provision of a patient-led intervention to increase empathy for and attitudes towards dementia in healthcare students (HEE-funded, Time for Dementia).

The structure and support arranged through the theme delivers the research strategy in part through developing talent. For example, **Paton** completed her PhD in the faculty prior to working as an NIHR clinical fellow and now as a Clinical trials fellow. She has benefited from our leadership training and mentoring program and has developed an independent research group focused on measuring foot stress/strain to produce (and test) tailored insoles.

Theme 2. E-health and Technology

This UoA3 theme includes research into patients' use of digital devices (e.g., robotics) and online collaborative learning between patients and professionals. **Our UoA3 Centre for Health Technology (CHT)** is focussed on digitally-enabled innovations, working with a network of cross-sector partners, including NHS, industry, health and social care organisations and patient groups, to deliver research and development of international importance. The CHT has seven areas of research focus: robotics and AI, virtual and immersive reality, e-health and telehealth, evaluation and health policy related to digital, technology implementation and behaviour change, cybersecurity, and assistive music technology. CHT is agile, meeting mostly online in response to new projects or funding opportunities but with the focus on inter-sectoral collaboration with industry, patient and community groups, and students, enabled by the unique population and geographical characteristics of the South West region of England.

There are three programmes of work:

• Development of e-health ecosystems supporting regional development linked to health and wellbeing, typified by the e-Health Productivity and Innovation in Cornwall and Isles of Scilly, EPIC1 (2017-2020, Ray Jones) and EPIC2 (2020-2023, Ray Jones) projects. ERDF outputs from EPIC1 included supporting 66 businesses, creating 11 new jobs, establishing 27 research collaborations, helping 5 new start-ups, bringing 5 new products to market, and 11 new products to firms. A key strand is dementia, improving use of technology in care homes through robotics (working on robopet design), and smart speakers 'normalising' voice technologies. Another strand has been embedding e-Health in the nursing curriculum with Plymouth cited as an example of best practice for social media use and students being 'agents of change' by HEE.

• Research council funded work includes the **Radio-Me** EPSRC funded project (**Banerjee**) for assistive technology for people with dementia and the seeding of new projects through collaboration with the School of Engineering, Computing and Maths in a Doctoral Training Programme.

• NHS funded work includes **e-coacher** (**Taylor**) and recent COVID related grants such as two video-consultation-related projects (**Byng, Freeman**).

Other examples of the development and evaluation of digital technology in UoA3 include apps to help people lose weight; websites for cognitive behavioural therapy; sensors and devices to track fitness and movement in Parkinson's patients; and remote working by general practitioners (**Byng**, COVID ESRC, led by Oxford). **Shawe** has collaborated on a digital tool for contraceptive choice



(NIHR Contraceptive Choices), and with Industry on using a fertility awareness app to conceive. Several of these projects have won national awards (e.g., HSJ and BMJ), including **Newman** whose work was recognised for the innovative aspect of the ACEmboile app in supporting doctors and nurses throughout the screening assessment known as the Addenbrookes cognitive examination (ACE III), and the development and use of EPSMON for monitoring patients with epilepsy to predict seizures.

Theme 3. Measurement of Health

This UoA3 theme fosters strong links with industry partners that wish to evaluate pharmacological and health technology products. Research activity from this group has translatable impact as evidenced by the submission of two UoA3 impact case studies (**Hobart, P. Buckhurst**). **Hobart**'s research programme focuses on the development of Patient Reported Outcome measures (PROs) for clinical research, trials and drug licensing. The scales he has developed for assessing Multiple Sclerosis (MS) are among a limited number contained in the United States Food and Drugs Administration (FDA) compendium of Clinical Outcomes Assessments. Since 2014 Hobart has developed new scales in MS and Stroke and worked as part of the LORA group to support scale development in dermatology (hyperhidrosis), urology (nocturia) and haematology (sickle cell symptom severity). The University's commercial research company, UPEL, has received **£1.27M income in the current REF period** from the licensing of Hobart PROs targeted for patients with MS, Cervical Dystonia and Parkinson's disease.

P. Buckhurst's work on intraocular lens assessment and ophthalmic instrumentation has produced new image analysis methods for assessing the stability of intraocular lenses implanted during cataract surgery, which have been used in clinical trials leading to FDA approval. Since 2014, UPEL has **received £500k of contract research income** involving the use of these outcome measures for commercially sponsored international clinical trials.

The Empowerment of Parents in the Intensive Care (EMPATHIC) outcome measures led by Latour has international recognition; the EMPATHIC instruments in neonatal intensive care have been listed as **the gold standard in the European Standards of Care in Newborn Health** presented to the European Commission (2018). The EMPATHIC instruments have been translated and validated in several languages (Chinese, French, Spanish, Portuguese, Greek, Turkish, Arabic) and are **used in over 40 countries** where in some cases they are the national standard quality indicator in paediatric critical care medicine.

UoA3 has extensive experience developing questionnaires to meet the guidelines provided by the FDA to allow widespread use of instruments, the most recent of which is the Severe Asthma Questionnaire (SAQ) developed by **Rupert Jones** and colleagues. The SAQ team have brought in 5 grants totalling £487,000; the latest from the European Respiratory Society severe asthma network is a 10-country study of the SAQ as a measure of quality of life in leading severe asthma services across Europe. The SAQ is also included in the International Severe Asthma Registry which has over 22 countries and the registry creates a data platform that is used in a range of commercially sponsored studies.

Theme 4. Dental Research

This theme ranges from basic dental research with a focus on applied dentistry, to the implementation of public health approaches. Our regenerative dentistry team has a translational research focus on tooth stem cells and regeneration (**Hu**), novel dental implant surface coating development to retard bacteria (**Tredwin**), and tissue engineering and biocompatibility testing (**Salih**). **Hu's** work showing novel molecular tuning mechanism for stem cell fate control has been globally reported by more than **100 media outlets including the Telegraph**, with images selected for the Day by the Medical Research Council; his EMBO J (2019) paper was elected by the GE Reports as one of the **5 Coolest Things on Earth This Week**. The team has active collaborations with more than 30 international institutes and has signed 6 research MoU.



Our evidence-based dentistry and oral health research programmes (**Nasser**) are focused on identifying issues that are relevant to primary care dentists, e.g., how anxiety can affect decision making in dentistry and patient centred oral health care measurement frameworks. Three academic clinical fellows (ACFs) in the programme have gained PhDs (Alexander, Mills, Allen) and two ResMs (Plessas and Delgado). Peninsula Dental Social Enterprise (PDSE), a community Interest Company (CIC) wholly owned by the university, has invested £321k from donations to support UoA3 dental research this REF period, including to develop an evaluation framework for measuring the impact of an oral health service programme involving community engagement on oral health inequality and to support post-doctoral fellows and PGRs in basic discovery research.

Research strategy

Our four UoA3 themes provide structure and definition to our research portfolio. We foster a vibrant ecosystem of health research across the faculty, with strong mechanisms to maintain a team ethos to encourage cross-fertilization and sharing of best practice across the intramural landscape. Our strategy has seven specific objectives:

1) Building effective collaborations. We strengthen our community of research by encouraging shared behaviours and maintaining responsive structures within PIHR to drive inter-disciplinary and cooperative working. For example, the basic dental research reported in UoA3 interlocks with the basic research expertise and facilities reported in our UoA1 and both benefit from a shared resource policy.

2) Expanding the size and volume of awards. Increasing our research income boosts research volume and is delivered through enhanced collaborative working and professionalization of our research application processes. We have increased professional training and the award application cycle is actively managed with greater levels of scrutiny to improve quality. This process started in 2018 and has contributed to a more than doubling of grant capture (~£11M in 2019-2020 compared to a prior 4-year average of £4.1 M) across the FoH.

3) Providing a suite of resources to facilitate research integration and excellence. The university has invested in infrastructure to support UoA3. The offering to researchers in the unit includes our **£24M Intercity Place investment** (opening in 2022 and housing Nursing & Midwifery and Allied Health Professions in dedicated research space), the Derriford Research Facility (£16.9M investment, opened 2018 and home to UoA3s' Bossing, Dun, Hu, Salih, and Tredwin) and the Brain Research Imaging Centre (£9M opening in 2021 and home to UoA3s' **Marsden**).

4) An open-frame network of expertise in project development. This includes a fully-registered Clinical Trials Unit (PenCTU); NIHR South West Research Design Service (SW-RDS); NIHR PenARC; development of a Joint Clinical Research Office with our main NHS partner; and access to NHS Clinical Research Facilities such as the Lind ward (8-bed overnight research unit at University Hospitals Plymouth). We continually strengthen our relationships with local health and social care providers across the region, e.g., the UoA3 South West Clinical Schools programme has increased research capacity particularly in Nursing and Health Professions and has attracted NIHR doctoral fellowships and the awarding of the NIHR funded MClinRes programme.

5) Full-service research support. This includes grant writing workshops, funded external review of applications, RDS, CTU and PenARC (previously PenCLAHRC) methodological expertise, in-school support through an Associate Head of School-Research and access to a university-wide support structure. We help staff with heavier teaching loads to develop research capacity by forging links with active research colleagues and seek to adjust work-load allocation to make room for research.

6) Exploiting our intellectual property. UoA3 has an excellent record of enterprise activity and we have developed a FoH KE-Enterprise Committee tasked with commercializing our research with a £110K annual budget (2020).



7) Supporting the development of our ECRs and junior faculty. We have built on our staff mentoring programme, developmental support mechanisms and training opportunities to expand the pipeline of excellent junior faculty coming through into more senior roles and developing larger research programs. This is of particular significance in newer fields of health research, such as allied health.

Impact Strategy:

The 7 objectives of our Research strategy are translated into impact through the deployment of HEIF funding through a Faculty KE-commercialization Committee with regular open calls for development projects (up to £15K each) such as proof of concept work, project development costs or marketing surveys. In a process managed by the Associate Dean Research (ADR), projects can subsequently be developed by a university Priority Bid Program offering enhanced support and project management. This mechanism underpinned successfully projects such as EPIC and the South-West Health Innovation Partnership. Clinical impact is achieved through the unit's CTU, SW-RDS, Statistics group and Research Support office (described below). A wide variety of public-engagement activity (described in section 4) is important for delivery of societal and economic impact of our research; support for these activities has evolved from the structures of the Institute of Translational and Stratified Medicine and the Institute of Health and Community into those of the newly launched PIHR.

Future Research and Impact Plan:

Future research expansion will be achieved following the 7 objectives of our Research Strategy (above). We will continue to support and grow our 4 themes of research excellence in UoA3. Growth will be achieved through strategic recruitment into these established areas while remaining nimble and responsive as opportunities arise. We will continue to assist staff who have an emphasis on teaching to develop their research interests (see Section 2), which aligns with the University's 2030 strategic aim to increase the proportion of research-active staff. Opening of our new research facilities (BRIC, DRF, Intercity Place; see section 3) will provide a permissive environment for increased collaboration between UoA3 faculty, and expansion of research volume as grant capture accelerates (see section 1: Research Strategy and section 2: Staff development and support). These changes will also promote impact growth which will be coordinated through the new PIHR where our UoA3 submission forms the majority of the 'PIHR: Health Across the Life course' and 'PIHR: Digital-Health' themes, along with the dental elements of the 'PIHR: Frontiers in Discovery Science' theme.

Interdisciplinary working:

Our success in this area is evidenced by the interdisciplinary range of our UoA3 outputs, which cover a wide research terrain (11 main subject areas; SciVal) and in our close and productive links into industry (see section 4). Our research facilities such as BRIC, DRF and Intercity Place are organized on the principle of barrier-free shared resource allocation, with flexible group sizes and open-frame space allocation, an arrangement that is conducive to collaborations (section 3). PIHR is a strategic investment that spans all three university faculties and forges links that cross school, faculty, and university boundaries and with the NHS and social care; for example, the conjoined working of **Banerjee** with the Faculty of Arts, Humanities and Business (e.g., Radio-Me), and **Ray Jones** with the Faculty of Science and Engineering (EPIC) (see section 3).

Research and Impact strategy delivery

Research across the FoH is coordinated by the ADR, and research in each school is overseen by an Associate Head of School-Research (AHoSR). This group meets monthly and representatives of all research stakeholders attend a termly Research Committee which drives forward the research strategy and also receives reports from oversight structures (Governance, Doctoral, Ethics, Animal Welfare, KE-commercialisation). The ADR represents research at the bi-monthly Faculty Executive Group and on university bodies (Senior Leadership Forum, Senate, Doctoral College, R&I committee), and is responsible for monitoring and maximising award capture, managing the staff of the faculty research support office and for developing faculty research strategies. This arrangement has clear lines of responsibility to enable an open and collaborative culture and supplies the resources (see under) required for the kind of coordinated approach to impact that is highlighted in our four case studies (**Hobart, Nasser, P. Buckhurst, Freeman**). Our research strategy is integrated across the faculty and within the university and the new PIHR is central to this, bringing together groups with shared interests and skills to foster collaboration within the faculty and facilitating research links with regional and national partners. This coordinated delivery of strategy in UoA3 is underpinned through 8 key mechanisms:

1) Study Support. This includes PenCTU (18 staff, 15.4FTE, led by Creanor/Allgar), PenARC (Byng, Axford), and the Southwest Research Design Service (SW-RDS: Clyne). The NIHR-funded SW-RDS is co-located with the PenCTU and is accessible to all staff and clinicians, with the focus on providing guidance for NIHR related projects. Of 56 award applications consulting SW-RDS in the current REF period, 32 were successful and total research funding secured in collaboration with teams throughout the peninsula, was £17.3M. The service runs an annual research retreat with immediate and ongoing access to dedicated specialists including health economists, statisticians and PPI experts; in addition to regular advice clinics. The effectiveness of this approach is demonstrated by successful NIHR grant applications, e.g., the ENGAGER program grant (**Byng**), £600k RfPB funding (Freeman) and awards ranging between £97K-250K to Endacott, Shawe, Hosking. Implementation scientists work alongside our local experts to ensure that research is implemented within health and social care settings, thereby optimising research impact. For example, a significant reduction in pressure injuries in the community in Cornwall following the implementation of continuous pressure mapping technology, which has since been rolled out to other regions of the South West funded by the Health Foundation's Scaling Up Improvement programme; a collaboration with our regional AHSN to support their spread of innovation programme; and the South West Clinical School doctoral research, which has a strong implementation focus.

2) Patient and Public Involvement (PPI). PPI underpins all stages of applied health/social care research in UoA3. The Peninsula Patient Involvement Group (PenPIG: embedded within PenARC) works alongside the PPI team to maximise the benefits and impact of our research. The PPI team also supports researchers in designing and developing their grant-specific PPI strategy. Further, the SW-RDS has a nominated PPI facilitator and provides funds for engagement activities to develop research proposals. This PPI engagement runs alongside numerous patient and carer-based groups who work in collaboration with our research leaders (e.g., ICUsteps national PPI group (Endacott); Maternity Voices Partnership RfPB award (Shawe)). Our Interest in addressing health inequalities provides extra incentive to understand how to engage with under-represented groups and communities. This is demonstrated in the ENGAGER and STRENGTHEN trials involving offenders (Byng, Taylor); our engagement with people with severe and complex disability who are often excluded from many research trials and clinical interventions, such as the work undertaken by Freeman (SUMS and BRIMS, CogEx); and the work with improving technological access in care homes (Ray Jones).

3) Methodological support. UoA3 includes experts with extensive methodological expertise. For example, **Taylor** and **Byng** are leaders in process evaluation and assessing intervention fidelity, especially involving multiple health behaviour changes within large NIHR funded trials (e-coachER, TARS, STRENGTHEN, ENGAGER, PARTNERS); **Kent** sits on the JBI Advisory Committee; **Freeman** sits on UK NICE Guidelines Committee for MS, **Nasser** sits on the Scientific Committee and Methods Board of Cochrane (see section 4 for more). Access to this expertise is facilitated by a research methodology directory and regular methodological seminars such as the recently organised 'Measurement Properties' event. The Joanna Briggs Institute Centre of Excellence (JBI: **Kent, Shawe**) -accredited systematic review trainers and the Cochrane Priority Setting Methods Group (**Nasser**) complement this shared knowledge approach, reflecting the methodological strength of the unit and providing opportunities for local, national and international networking. Our JBI Centre of Excellence provides bi-annual, week-long systematic review training and accreditation events. The JBI Comprehensive Systematic Review Training Programme is a five-day programme which prepares researchers and clinicians to develop, conduct and report robust, high quality systematic reviews of different evidence types to provide the strongest possible evidence to inform decision



making or clinical guideline development in healthcare. Since 2015, we have trained over 100 health professionals in JBI systematic review research methodology.

Our PenARC staff contribute to information science and review methodology. PenARC provides a full range of methodological and support services to enhance local research capacity and capability. Examples include monthly clinics freely accessible to all postgraduate researchers, clinicians and university staff in the areas of evidence synthesis for the production of systematic and scoping reviews; PPI, and qualitative methodology. PenCHORD (Peninsula Collaboration for Health Operational Research and Development: part of PenARC) assists researchers in utilising advanced quantitative techniques to model healthcare services and predict the impact of change Implementation Scientists work alongside our local experts to ensure that interventions that are shown to be effective are implemented within health and social care settings, thereby optimising research impact. Further specific qualitative research methods support has been initiated by contracting two professors with extensive expertise in qualitative research (Latour, Neil). The collaboration among schools (e.g., School of Nursing & Midwifery and School of Health Professions) in this field has led to successful grant applications using mixed-methods study designs such as NIHR CADF applications resulting in 3 PhD studentships. Additional success is the inclusion of qualitative research methods in the HEE £1M award to develop the MClinRes in 2015 (Marsden, Kent, Latour).

4) Statistical Support. The Medical Statistics group (**Allgar, Creanor, Streeter, Hosking**) provides comprehensive support throughout the whole process of design, development and delivery of clinical trials and other complex clinical studies in collaboration with the SW-RDS and co-located PenCTU, with whom the group works seamlessly. In addition to being responsible for the programming and analysis of a number of large funded studies, the Medical Statistics group carries out both methodological and applied research in areas of interest that include risk assessment and screening as well as the design and analyses of clinical trials. Statistical clinics provide support monthly, particularly targeting ECRs and post-graduates/PGRs.

5) Administrative and Financial Support. The FoH Development and Partnership Manager (1FTE) horizon-scan grant opportunities and provides support and feedback on grant applications, in conjunction with the ADR, the four AHoSR and University R&I. This group also work collaboratively with Government Knowledge Transfer Advisors, staff within the Knowledge Transfer Partnership Office (KTP) provide extensive guidance and access to industry partners for the development of KTP applications. Ongoing support is provided for researchers and KTP Associates. This includes regular project management group meetings and advice on development plans and training pertinent to the industry partner with the explicit aim of enhancing research impact. Following a successful application, a dedicated member of the Financial Management Team supports the financial management of awards, providing regular reports.

6) Ethics and Governance. A dedicated University Sponsor representative and GDPR Officer (1FTE) works with FoH research governance specialists to provide training, advice and clear direction required to effectively implement health and social care research, overseeing applications to NHS Research Ethics Committees to IRAS and the Health Research Authority. non NHS post-graduate research approvals are via the FoH Research Ethics and Integrity Committee (FREIC) (UoA3 chaired by **Neill**, 0.4 FTE). Through audits of site files, data management plans, and Good Clinical Practice certification, these assure researchers adhere to the highest governance standards. This is strengthened by our strong links with Governance Officers within regional NHS Research, Design and Innovation Departments. PenCTU has a quality management system comprising a suite of Standard Operating Procedures, work instructions, tools and checklists to ensure regulatory, governance and quality standards are met in the conduct of clinical trials.

7) Project Management. The PenCTU provides the full range of project management support for clinical trials including trial management, data management, randomisation, database management systems, data input, quality assurance and analysis. In line with good practice, all projects are



managed through regular Trial Management Group meetings with patient representation. Trial Steering Committees and Independent Data Monitoring Committees are convened depending on size and scope of project. Researchers work closely with NIHR Clinical Research Network staff from the outset, for example in the calculation of NHS Support Costs and Excess Treatment Costs, raising study awareness, and facilitating recruitment.

8) Mentorship and Peer Review Systems. There is a clear pathway for the review of all grants. This includes mentorship throughout the grant writing process, mandatory independent peer review and a standardised risk assessment of impact on staff workload, resources and finances. Applications are registered and tracked through the online Award Manager system, which alerts individual AHoSRs as soon as an interest is logged, allowing them to mentor and support the development process (section 2). There is a FoH Research Development Fund (e.g., £55K in 2020) used to provide external paid reviews of pre-submitted applications, in addition to the internal expert review system.

2. People

Staffing strategy and staff development

UoA3 comprises 48.01 FTE academics including 15 full professors and 11 associate professors; over-all gender balance is 52% female: 48% male, with close parity between the sexes in outputs. 13.8% of UoA3 faculty identify as BME. The Schools of Medicine and Dentistry currently hold Athena Swan Silver awards, Health Professions and Nursing & Midwifery Bronze awards and are working towards Silver.

We have built on the staffing strategy described in our UoA3 REF2014 submission. This included 'To develop world-class research in dentistry, nursing, midwifery, biomedical science, and physiotherapy'. In this REF period 9 full professors have been recruited/promoted: 5 in theme 1: Developing and Evaluating Health and Social Care Interventions (**Taylor, Neil, Shaw, Freeman, Banerjee**); 2 in theme 2: E-Health and Technology (**Taylor, Demain**); 4 in Theme 3: Measurement of Health (Latour, P. Buckhurst, Shawe, Neil) and 1 in theme 4: Dental Research (Hu). Our 2014 strategy also included 'To support disciplines, such as optometry, that are new to the University but that offer future research potential'. Professorial staff have been recruited to lead both Optometry (Artes) and Dietetics (Hickson); in addition, two of the existing academics in Optometry have been promoted to Associate Professor (P Buckhurst, H Buckhurst) and one onto full Professor (P Buckhurst). Within nursing and midwifery, additional Professorial staff have been recruited to further enhance the link between clinical practice and health outcome measures (Latour, Shawe).

This staffing strategy was implemented alongside an annual leadership training programme to ensure that our senior academics are empowered and appropriately skilled to support and develop their teams. The university has an established Future Leaders program and a cohort of prospective leaders within the unit have graduated (e.g., **Freeman, Nasser, Pearce**, etc). In addition, our local NHS Hospital Trusts Organisational Development Facilitator provides training for our staff on programmes developed for senior clinicians in UoA3.

Staff PhD program

A further strategy described in 2014 was to 'develop...new academic disciplines such as paramedicine and occupational therapy'. The modern paramedic profession is only ~30 years old and 'paramedic' has only been a protected title since 2001. Occupational therapy has been a registerable degree for the past 40 years. In both professions it is difficult to recruit academics at post-doctoral level. **Our strategy has been to upskill current staff**. In this period, two paramedics (Henderson, Allum) and six occupational therapists (Cunningham, Whiting, Eyres, Krizaj, Raine, Twinley) have graduated on a part-time PhD programme that covered fees + £6k bench fees. In addition, all students in this program are eligible to attend two modules on our taught masters in clinical research. A transparent competitive process is used to assign staff to the PhD programme



which is open to all professions and other development areas included in this program include Dietetics (Carrol), Physiotherapy (Hunter, Halliday, Lepesis, **Gunn**), Nursing/Midwifery (Carey, Hambridge, Henderson, North, Tobin) and Dentistry (Hanks, **Nasser**, Ali). The success of this approach is highlighted by the inclusion of graduates of this development pathway within the current REF submission (Gunn, Nasser).

Staff development and support

The University has implemented the Concordat to Support the Career Development of Researchers and was among the first 35 European HEIs to receive the EU HR Excellence for Researchers kitemark. An example of good practice is the University of Plymouth Research Leadership Programme. During this REF period, 5 staff from UoA3 attended the programme, which is delivered by the external providers Barefoot Training. It is a year-long programme consisting of an intensive three-day summer course, followed up by four half-day workshops, and a series of one-to-one phone meetings with the instructors across the year to help the staff set research objectives and find ways to plan for them and implement them. The School of Nursing and Midwifery have invested in building research capability and capacity through appointing a Full Professor (**Neill** 0.9 FTE) to lead on staff research development, introducing a system of research champions (n=5) within each disciplinary team and funding pre-doctoral and post-doctoral research internships.

All new staff are enrolled in an induction process which plays an important part in settling staff into their roles and is supported by an overarching university Induction Policy & Procedure. As part of induction, staff are required to complete e-learning programmes including Unconscious Bias, Diversity in the Workplace, Health and Safety and GDPR and Information Security. The effectiveness of training is actively monitored through the staff survey feedback. The annual staff Performance Development Review (PDR) provides for monitoring of performance and discussion and recording of staff development. PDR is used to look back over training and development, to plan and support the next steps forward and to identify appropriate needs and linked opportunities for the future. To support and train the people undertaking the PDR process workshops are offered including a workshop on "having difficult conversations", in addition to PDR calibration meetings to ensure a uniform standard is applied. We have a termly Faculty Newsletter that is circulated to all staff and further information disseminated by the Heads of School to ensure that everyone is aware of all potential training and development opportunities. The newsletter celebrates staff achievements at all levels, as well as achievements external to working life.

All UoA3 members develop a personal research plan, have regular discussions with their Associate Head of School-Research, facilitating planning of sabbaticals and analysis of workload. Progress in research is monitored by their Associate Head of School-Research as well as through PDR. There is a peer review panel system for reviewing research papers where experienced and early career researchers review and debate the quality of research papers produced within the unit and in addition, our peer review and mentoring system supports the development of research grants. Changes in research responsibilities are managed through the PDR process with a flexible approach to FTE allocations, and successful researchers can for example reduce teaching/admin loads and vice versa (within a 20-80% band). Career progression requirements and progress are also discussed in this forum. FTE-bearing research roles that become available are publicly advertised with a call for expressions of interest to allow all faculty the opportunity for leadership experience. Leadership opportunities are offered in major university committees such as the R&I Committee, where there are designated places for early- and mid-career researchers. New academic starters are offered a negotiated start-up package that may include set-up costs, fellowships and PGRs, depending upon seniority. For each grant application a reviewer is assigned as early in the process as possible. The reviewer (from the senior research team) provides guidance and offers advice to improve the quality of the grant. We also run a faculty-wide research support program where **UoA3** staff can consult personally with external professionals (e.g., Parker-Derrington Ltd) to improve their grant writing and submission. This can involve several 1-2-1 sessions and reviews of grant drafts. Regular group sessions are delivered by external consultants and through the university

Funding Advisory service who bring in research council staff to provide tailored advice, while the South West Clinical School Professoriate also work closely with ECRs and other clinicians, providing grant support, writing workshops, and 1-1 support and advice.

Open Research Environment

The FoH values open access to outputs and data and has mechanisms to provide these that dovetail with those at University level (Open Access policy and Research Data policy). The ADR manages a \pounds 20K pa., budget that can support open-access publishing costs, and the Faculty research support office helps monitor and assist with output and data management lodging on open-access platforms such as PEARL.

Early Career Researchers

ECRs are assigned a research mentor from the senior research team who are responsible for helping identify and develop fundable ideas. The mentor also provides an important role in pastoral support, helping integrate new staff into the culture and processes of the unit. The requirements of the Concordat to Support the Career Development of Researchers are embedded in University HR policies, under which our ECRs have representation at Faculty and School Research Committees. There is a transparent workload allocation system that enables the provision of a balanced and fair distribution of ECR research time. ECRs are supported for attendance at national and international meetings and conferences for presentations and networking through School staff development funds, this equates to approximately £1000 per member of staff. The University Doctoral College runs a range of developmental workshops for postdoctoral and ECR Researchers on all aspects of professional practice. In addition, PhD students and ECRs are encouraged to attend modules from our research masters programmes. ECR support groups encourage peer support, including an independent forum based in the faculty, one as part of the SW Clinical Schools in Cornwall, and one as part of the SW Clinical Schools in Torbay. We have extended our mentorship programme to help train junior researchers in other countries, for example, the Collaboratoire project training junior researchers in the Philippines and Asia.

Equality and diversity

The Faculty Athena Swan Self-Assessment Team meets every two months and reports to the Faculty Executive Group and monitors our equality staff survey where **93% of responders** were aware of our equality and diversity principles and 85% of survey responders strongly agreed/agreed that the FoH is committed to supporting all staff and students with protected characteristics. These strong numbers underscore our firmly embedded equality ethos; as also evidenced by recent actions such as the ongoing **decolonisation of our syllabus**, and supportive messaging of developments like **Black Lives Matter**. To further widen the reach, we have extended our equality training to all Honorary Associate Lecturer contracts and we encourage all staff in the unit to undertake further equality and diversity training in Transgender Awareness, Mental Health Awareness, Prevent training, Intercultural Communication and Dementia Awareness. In 2020 we have introduced a Faculty-wide **equality pledge programme** as part of our PDR process where all staff are encouraged to generate a pledge for action they will take to improve equality Impact Assessment to identify patterns and areas for increased support to achieve equality and encourage diversity and have actively engaged with staff to create a programme of development and support including:

• University Network of Dignity and Respect Advisors (trained, confidential volunteers who offer a listening ear and guidance).

• Gender split on all recruitment panels; all panellists undergo appropriate inclusion training.

- Academic Women for Women sessions to foster collaboration and provide a safe environment for exploring aspects of promotion.
- **Twenty people have received leadership training** over the past three years with a gender split of 15F:5M. Training has ranged from the Aurora programme (for female

Associate Professors) to our University Research Leadership Programme (run by the Barefoot Training Company Ltd).

• Women's Mentoring Scheme which aims to enable women to realise their potential here at the University of Plymouth and beyond. We also support a Women in STEM Network which celebrates the work and achievements of women.

• Springboard scheme for female ECR researchers which covers areas such as career development, building confidence, assertiveness, aspects of being a woman, identifying priorities.

• LBGT+ Staff Forum which provides network opportunities internally and externally.

Staff welfare promotes staff retention and reduces erosion in under-represented groups. We have developed a progressive program of welfare activities that includes providing administration support for working groups (lunchtime walking, 3 free Pilates sessions a week), as well as 'pop-up' mindfulness sessions and the provision of a permanent wellbeing room.

Research students

62 PGRs have successfully completed PhDs in this REF period, **a >360%** increase from the last REF (14). This was achieved through direct investment in University studentships and an increased number of senior researchers to expand the supervisor pool and increase PhD studentship awards such as NIHR Doctoral Research Fellowships (CDRF), in addition to increased part-time PGR enrolment. UoA3 PGRs are funded through a mix of program, university studentship and charitable sources. University-funded studentships are a significant form of institution support to the unit; within the FoH there were an average of 10 awards annually, representing ~£800K pa., in direct (bench fee, stipend) and deferred (fee) costs each year. We have also upskilled the staff in the unit, particularly in professions that are relatively new and where post-doctoral academics are rare. UoA3 also attracted a growing number of self-funded PhD students from the UK, Malaysia and Dubai.

Completion rates have remained high, achieved through a well-regulated safety net of support that includes a Director of Studies leading on supervision and by co-supervisors, who together act as a supervisory team. All teams strive for gender balance and have at least one senior academic with extensive supervisory experience including successful completions. Good supervisory practice training is mandated to all supervisors and new students benefit from induction sessions run locally, in addition to the mandatory induction by the University Doctoral College.

Study progress is monitored online, with recorded supervisory meetings 3-months at the minimum. Students complete a Project Approval stage 3-5 months after starting (for full-time students), approved by their supervisory team and based upon a brief project description including a timeline, a data management plan and the completion of mandatory induction. 12-15 months into their studies students undergo a Confirmation of Route/ project transfer from MPhil to PhD status and submit a study report detailing progress and future work. At this stage, they also give an oral presentation to the Faculty and sit a 'transfer *viva*' chaired by at least one independent expert commentator (internal). This structured process serves to ensure that the student is supported, makes good progress and is well prepared for the final write-up and *viva voce*.

Student welfare is of central importance and, in addition to the individual members of their supervisory team, students can consult a Postgraduate Research Coordinator based in each school as well as a suite of Well-Being services offered by the University, including one-to-one counselling and mental health appointments, personal and group support and development sessions. In addition, Disability Assistance Services help any PGR student with a disability with their study support requirements.

In addition to providing pastoral support to students, school PGR Coordinators are responsible for monitoring and overseeing admission and supervisory team nomination, quality assurance, annual monitoring, etc. The PGR program within the faculty is overseen by a Faculty Doctoral Committee,



which reports to the University Doctoral College Board, and is chaired by a faculty Deputy Director of the Doctoral College (UoA3 **Kent**, 0.8 FTE total). PGR students are directly represented on the committee, which in addition to regulatory processes monitors student welfare, training and satisfaction. An Annual Monitoring exercise completed by PGR students as well as Directors of Studies in all schools covers student experience and progress. We are proud to be a diverse learning community and any student in the faculty can become a member of the Equality, Diversity and Inclusion Committee, which ensures the faculty remains an inclusive and welcoming place to work and study.

The student experience is enhanced by research, personal and transferable skills training opportunities offered by the University's Doctoral College Researcher Development Program, which covers themes such as Knowledge and intellectual abilities, Personal effectiveness, Research governance, and Engagement, Influence and impact. A PGR Training and Career Development lead at the Faculty provides additional support. There is also a faculty **PGR conference fund** that helps students attend conferences, and the faculty holds an **annual Research Event** where students submit posters and give oral presentations. In addition, students benefit from a variety of seminar series, such as weekly research presentations in which both students and staff present, and monthly Research talks by external speakers in all schools. These communal events are held to foster a sense of community for our students who all have allocated office desk spaces and access to computers.

3. Income, infrastructure and facilities.

Grant income

UoA3 award income exceeded £18.5M in the current period, up 483% from the 2014 REF (£3.17M). Highlights include:

The Dementia-Person Aligned Care Team (D-PACT) programme: a five-year NIHR programme (PGfAR, **Byng**, University of Plymouth = 1.7M) to develop and evaluate a system for dementia support based on general practice for people living with dementia.

PRO-GROUP (ImProved): a 5-year NIHR Programme (UP lead: **Pinkney**, UP = \pm 1M) to investigate the evidence base for Tier 3 interventions, and specifically to test the idea that a group-based behavioural intervention can be an effective model of care.

E-Health Productivity and Innovation in Cornwall and the Isles of Scilly (EPIC): a collaborative and interdisciplinary project, initially funded in 2017 with £2.7M from the European Regional Development Fund and the South West Academic Health Science Network, with a further £4M to extend the project until 2023. Led by UoA3s Centre for Health Technology (**Ray Jones**), EPIC is fuelled by input from a large number of partners, organisations and individuals across the South West, including healthcare trusts, charities, social enterprises, patient groups, and students.

The **Applied Research Collaboration South West Peninsula (PenARC)**: undertakes high-quality applied health research focused on the needs of patients and supports the translation of research evidence into practice in the NHS (**Byng** = \pounds 2.4M 2014 + \pounds 3.4M 2019). The ARC supports a range of research projects, e.g., in social prescribing (**Husk**, reported in UoA22), promotion of young people's mental health (**Axford**), mental health transformation (**Byng**), and in police and health care (**Callaghan**). It has also contributed to the development of a range other work reported here (**Ray Jones, Kent, Freeman**) and PhD studentships.

ENGAGER (**Byng**): a 6-year NIHR Programme grant (UP = \pounds 1.5M) to develop and evaluate a collaborative care intervention for offenders with common mental health problems delivered at the point of prison release.



The **Centre for Dementia Studies (CDS)**. UoA3 is home to a second node of the CDS that **Banerjee** established in Sussex, including his ESRC/NIHR Dementia Research Initiative funded **DETERMIND** programme (£5M), his £2.4M **SYMBAD** NIHR HTA RCT and his £3.7M HEE-funded **Time for Dementia** programme. Banerjee also collaborates with Miranda in the Faculty of Arts, Humanities and Business in a £540K **Radio Me** project that uses AI to customise radio choices for people with dementia.

The NIHR **Research Capacity in Dementia Care Programme** (Kent): led In the South-West by PenCLARC, will increase the number of researchers active in dementia care research, including potential future leaders in dementia care research from nursing and allied health professional backgrounds. The funding (£198K) enabled four PhD studentships to be provided to nurses, midwives and allied health professionals.

A multi-centred randomised controlled trial to investigate the effects of adding web-based coaching (e-coachER) is an NIHR HTA funded RCT of an exercise referral scheme as a way to increase uptake and sustained health enhancing physical activity for patients with chronic physical and mental health conditions (**Taylor** = £900k). It is a web-based coaching/exercise referral scheme for patients with chronic physical and mental health conditions.

STRENGTHEN (pilot RCT) (Taylor, £500K): explored the feasibility of conducting a multi-centred RCT to improve well-being and healthy lifestyles with health trainer support among offenders under community supervision. The findings showed promising support for the client-centred theory driven bespoke intervention, preliminary evidence for a positive effect of the intervention on well-being, and support for conducting a larger trial.

The **Trial of physical Activity and Reduction of Smoking (TARS)**: examined the effectiveness of individualised health trainer support for smokers to reduce smoking and increase physical activity (**Taylor** = \pm 1.9M). The trial recruited 915 participants across Plymouth, Nottingham, Oxford and London, and showed some signs of an Intervention effect on smoking behaviour and physical activity.

A series of projects have investigated the patient benefit in movement disorders such as multiple sclerosis (2014-2020, **Freeman** = £1M) including the **SUMS** and **BRIMS** studies. The unit has also received approximately £1.25M of research income from UK charitable bodies including £172K from the MS Society looking at vestibular rehabilitation and £440K from the Cure Parkinson's Trust. We also received smaller amounts of funding from charities and professional societies, including the College of Optometrists, the British Dietetic Association General and Education Trust, Fight for Sight, The Chartered Society of Physiotherapy and the Oral & Dental Research Trust. Awards related to rehabilitation research in the area of mobility and balance total £2.8M this REF period and include the **ACCEPT** study (**Freeman**), **EMAPP** study (**Freeman**) and the **VeRMiS** study (**Marsden**).

There has been significant support to dental/oral research in the unit from Peninsular Dental Medical Social enterprise, including in 2020 the award of a block grant covering 4 PhD studentships and 2 research fellowships largely to members of UoA3. In dental research, **Tredwin** and **Hu** have captured £1.4M, including 'Role of the FoxN1 gene as a central regulator of epidermal planar cell polarity signalling expression and function' (2014, 600K), a Marie Curie Career Integration Grant (2014:100K), Peninsula Dental Society Enterprise postdoctoral fellowships x2 (£260K), and Industry contract researches on biomaterials (£300K).

The unit has captured significant enterprise income, including £1.84M for development of health measurement scales by **Hobart** (e.g., Acorda, Roche), and £338K to **P. Buckhurst** for research around optical devices (e.g., Bausch and Lomb); in addition to screening services such as DQASS run through Med Stats and funded by PHE (**Creanor/Baker** £1.45M this REF period).



Infrastructure

Research work in UoA3 is conducted on 2 University campuses as well as numerous healthcare/NHS sites. The main campus currently hosts most of the research in Nursing as well as the clinical Optometry research at the new Optometry clinic within the University's wellbeing centre. Research within the School of Health Professions, School of Dentistry and School of Medicine is located on the North Campus co-located with the 1000-bed University Hospitals Plymouth NHS Trust, PenCTU, PenARC and SW-RDS. UoA3 has benefited from >£50M in infrastructure investment during this REF period (£24M of dedicated investment) to deliver the strategic priorities identified following the last REF submission.

In 2018, the £17.4M Derriford Research Facility (DRF) was opened on the north campus. This is a fully-equipped Biohazard II laboratory enabling us to conduct dental and translational health research. There is a strong collaborative interdisciplinary use of this facility with researchers from both UoA1 and UoA3 (Hu, Dun, Bossing, Tredwin) based here.

In 2021 another interdisciplinary research facility will open on the north campus – the £9M Brain Research and Imaging Centre (BRIC). BRIC hosts seven research labs, with a 3tesla MR scanner forming the basis of the main laboratory. Each laboratory is led by researchers from either UoA1, 3 or 4. The Gait lab within this facility is led by UoA3's **Marsden**. The Director of the BRIC is a dedicated 0.5FTE academic post, all labs have a dedicated academic lead, and the centre is supported by a full-time onsite radiographer and emergency medical support.

A new **£24M facility (Intercity Place)** is set to open in September 2022 at Plymouth railway station close to the main campus which will house the staff and majority of research facilities of the School of Health Professions and School of Nursing & Midwifery. This building **will double the number of research laboratories** available to UoA3 staff working in these disciples and will incorporate a bespoke applied optics laboratory and wet laboratory for human and animal tissue. In addition, the facility will bring together the post-graduate communities from both schools into a single office located adjacent to the research laboratories.

4. Collaboration and contribution to the research base, economy and society

Collaboration

The unit supports a number of outward-facing structures that foster research co-working and impact:

South West Clinical Schools

UoA3's South West Clinical Schools (SWCS) are centres for nursing research in five local NHS Trusts (Royal Devon and Exeter, University Hospitals Plymouth, Royal Cornwall Hospital, Somerset, Torbay & South Devon). The SWCSs are led by senior UoA3 nurse clinicians (Endacott, Kent, Latour, Pearce, Shawe) and have engaged >80 clinicians this REF period on research or quality improvement projects. In 2019, the Torbay Medical Research Fund awarded £250K to the SWCSs to support nurses, midwives and allied health professionals to develop applied health research relating to their clinical service. The funding will support doctoral fellows, who will undertake a PhD while continuing in their clinical role, and pre-doctoral fellows, who will spend the equivalent of one day a week over one year preparing a PhD. application. This support resulted in 5 successful NIHR Clinical Doctoral Research Fellowships (Lyndon, Collings, Rapson, Ede, Logan). Further awards included £500K Health Foundation Scaling Up Improvement for PROMISE (Pressure Reduction through Continuous Monitoring In Community Settings), a collaboration between Cornwall Partnership NHS Foundation Trust, the University of Plymouth and the University of Southampton to reduce avoidable and unavoidable pressure ulcers. Internationally, the SWCS shares methodological expertise in clinical research projects (e.g., Fudan and Hunan Universities, China; University of Leuven, Netherlands; Kiang Wu Nursing College of Macau).



South West Health Innovation Alliance

The alliance established in 2020 is a cross-sector partnership maximising opportunities for healthrelated research, innovation, knowledge exchange and R&D to generate economic growth in the Plymouth region. Initiated through £160k of co-investment funding from partners, and run by a fulltime Manager, the Alliance brings together the University, businesses, NHS, health and care organisations, local government and public sector bodies, providing a focal point for and gateway into the City's health innovation ecosystem. Notable impacts of this collaborative partnership approach to date include supporting the development of the City's Lighthouse Lab bid to the Department of Health and Social Care and securing £1M+ funding from the Heart of the South West Local Enterprise Partnership to set-up a Health Tech Innovation Hub at Plymouth Science Park (jointly owned by the University and Plymouth City Council).

Plymouth Public Health Forum

This collaboration between the University and Plymouth City Council showcases public health research and encourages networking between groups to promote public health research. Two or three public events are organised each year and 35-40 people attend from community organisations (e.g., Plymouth Community Homes, Well Connected), Charities/volunteer organisations (e.g., Soup Run); the Local Authority; University Hospitals Plymouth NHS Trust and the University. Meetings include talks on initiatives including 'Thrive Plymouth' the city's 10-year plan to reduce health inequalities and understand chronic disease in the city.

International/national roles

UoA3 staff have played significant roles in the national structures that frame health related research in the UK, for example **in the NIHR**: Deputy Director, NIHR ARC for the South West Peninsula (**Byng**), NIHR Programme Grant panel (**Byng**), NIHR Integrated Clinical Academic (ICA) Clinical Doctoral Research Fellowship panel (**Endacott (deputy chair), Marsden, Hickson**), NIHR Research for Patient Benefit panel (**Hickson, Kent, Pearce, Freeman**), NIHR ICA Pre-doctoral Clinical Academic Fellowship panel (**Marsden, Hickson**), Management committee for NIHR ICA Mentorship for Health Research Training Fellows programme (**Marsden, Hickson**), NIHR Training Advocate for Dietetics (**Marsden, Hickson**); Neurodegeneration National Specialty Group (NIHR CRN) (Lead/Chair since 2017, **Carroll**); InterAct and Integrated Academic Training Operational Group (NIHR Academy member; **Carroll**). Senior Investigator and member HTA and RfPB panels (**Banerjee**).

Our influence has had a major international reach, including Scientific Committee member CLEAN AIR Africa NIHR programme (**Rupert Jones**), Co-Director Global RECHARGE NIHR programme (**Rupert Jones**), Co-Director Lung Institute, Makerere University, Kampala (**Rupert Jones**), Evidence Panel for the XChange registry (**Axford**); Linked Clinical Trials Committee (International) (**Carroll**); Grant Committee, Research Foundation Flanders FWO – Reproductive Health (**Shawe**); Qatar Research Fund Committee member - Maternal & Reproductive Health (**Shawe**); Grant Committee member of the German Federal Ministry of Education and Research (**Latour**); Chief Nursing Officer England, Leading Change Adding Value Research working group member (**Kent** 2017-2019); Royal College of Nursing Research Projects on COVID-19 panel (**Kent**). International Family Nursing Association Country Liaison Coordinator and International Family Nursing Foundation Board member, International Network of Child and Family Centred Care Chair (**Neill**). Advisor on Dementia Research to WHO, Alzheimer's Disease International and the EU (**Banerjee**).

There are also numerous cases where we have helped to shape the direction of research at the National level, highlights include: BTS pulmonary rehabilitation quality improvement advisory group (**Rupert Jones**), Chair of Scientific Committee of the Salford Lung Study (**Rupert Jones**), National COPD Audit Primary care group (**Rupert Jones**), BTS Quality Standards group for Pulmonary Rehabilitation (**Rupert Jones**); Cure Parkinson's Trust Research Committee (**Carroll**); Parkinson's UK Grant Assessment Panel (**Carroll**); Parkinson's Portfolio Development Group (**Carroll**);



Trustee/Director Intensive Care National Audit and Research Centre (ICNARC) (Endacott); Trustee/Director National Confidential Enquiry into Patient Outcome and Death (NCEPOD) (Endacott); Invited nurse representative - National Advisory Group for Contraception in England (Shawe); Royal College Obstetricians & Gynaecologists Faculty SRH Clinical Studies Research Group (Shawe); Royal College Obstetricians & Gynaecologists Faculty SRH Training Committee (Shawe); NICE LARC Adherence Research Advisory Committee (Shawe); NICE Sexual Health Review Consultation Group (Shawe) Healthcare Safety Investigation Branch expert advisor (Neill), Royal College of Nursing Standards for Assessing, Measuring and Monitoring Vital Signs in Infants, Children and Young People (Neill)

Our staff take leadership roles across key journals: Journal Family Practice (**Byng**), Journal of Children's Services (**Axford**), Journal of Human Nutrition and Dietetic (**Hickson**); Associate Editor BMC Pregnancy & Childbirth (**Shawe**); Associate Editor BMJ Sexual & Reproductive Health (**Shawe**); Editor Faculty of General Dental Practitioners (**Tredwin**); Editor Implementation Science (**Kent** 2009 -2017); Editorial Advisory Committee JBIES (**Kent**); Editor-in-chief International Journal of Geriatric Psychiatry (**Banerjee**).

Covid-19

The University through its FoH moved swiftly to respond to local and national needs as the pandemic evolved. Equipment was loaned from our Derriford Research Facility through the Army's Second Logistic Division to the Lighthouse testing centre in Northern Ireland. We also loaned equipment, including large bench-top centrifuges, to the local testing laboratory at the University Hospitals Plymouth NHS Trust. At the first peak of the epidemic, Derriford Hospital testing laboratory lacked sufficient trained personal and we established a live document of volunteers with PCR skill from our laboratories with 48 individuals on call.

While complying fully with government measures, we put considerable support in place to maintain our virus research programmes. These included funded contributions to national programmes of vaccine development, local programmes such as clinical serology research into the virus and our own vaccine development programme spearheaded by our spin-out The Vaccine Group. This support included keeping our research faculties open for vaccine development with special safety measures in place. Through contingency-planning, when lock-down eased we were well prepared with risk-assessments and safety equipment for a rapid re-start of our research which has been fully operational since July 2020. Banerjee is leading the ESRC-funded DETERMIND C-19 grant which investigates the effects of the pandemic and responses to it on people with dementia and their family carers. Freeman leads a UKRI (MRC) funded grant (through the Covid scheme) with the aim of developing an assessment toolkit and training package to upskill practitioners to implement telerehabilitation for people with physical disability. **Byng** is leading the Plymouth site of the 'Remote by Default' Covid-19 project, funded through the ESRC, which will focus on the impact of remote by default on inequalities. Investigation of the scale-up of 'remote-by-default' working, where patients no longer automatically access face-to-face appointments, as a result of COVID-19 in Plymouth will help reveal any positive and negative impacts on individuals living in poverty or with complex needs.

Lighthouse Plymouth

The university's support of Covid-19 vaccine in combination with our unhesitating support for local and national testing was a strong factor in the selection of Plymouth for a 40K sample/day Lighthouse testing centre, based close to the DRF and operational from February 2021. The faculty ADR sits on the steering. group for the centre, and has worked to develop the opportunity for work and experience for UoA3 PGRs and alumni; similar support from the FoH has been significant to establishing regional LAMP testing laboratories, such as at Truro.