

<b>Institution: University of Dundee</b>
<b>Unit of Assessment: UoA3 Allied Health Professionals, Dentistry, Nursing and Pharmacy</b>
<b>1. Unit context and structure, research and impact strategy</b>

UoA3 brings together impactful applied health research from the Schools of Dentistry (SDEN) and Health Sciences (SHSC) at the University of Dundee (UoD) to address real-life issues affecting people and populations. Our research is world-leading in maternal and newborn care, stroke rehabilitation, and primary dental care. We are an internationally recognised centre of excellence for dental practice-based research and the production and translation of clinical guidelines (including during the COVID-19 pandemic). We aim to transform lives, improving health and wellbeing of people and communities through robust empirical research, evidence synthesis and knowledge translation working in partnership and collaboration. Our research influences the lives of people within their communities and the services they access to improve health and wellbeing.

Our ambition aligns with UoD's vision, being committed to world-leading interdisciplinary research that benefits people and society, locally, nationally and globally. Our strategy builds on excellence to enhance performance and reputation. Three research themes provide direction, enabling us to understand and tackle questions in health and wellbeing through innovative solutions. In this REF period, we secured awards in excess of £25 million in Dundee-led and co-led grants. Collaborations with governments, health, social care and third sector organisations nationally and internationally underpin our research, facilitating our success in achieving meaningful and measurable impact. Our research environment is complemented by our TEF Gold-awarded, research-led teaching, encouraging positive interactions and collaborations across disciplines.

People are central to our success. At the census date, we employed 37 (33.6 FTE) Category A researchers, of which 9 (8.2 FTE) contributed 50% of their time to the NHS. Our research community includes 21 research assistants/associates, two post-doctoral researchers and 44 PhD students. With over 15 disciplinary backgrounds, we have created a dynamic collaborative environment fostering interdisciplinary research, enabling us to address important questions in health and wellbeing.

### **Leadership and management**

Research strategy and operations are led by Associate Deans for Research (ADRs), who sit on the Senate Research and Knowledge Exchange Committee. This leadership influences university strategy and resource allocation, holding responsibility for policy development and implementation at School level. The ADR is a member of the School Executive Group, led by a Dean who, through the Deans' Group, feeds directly into the University Executive Group responsible for strategic planning and management of all aspects of academic activity.

### **Current research and research strategy**

Since REF2014 we have enhanced our applied research and increased critical mass. Following the 2015 University restructure, a review of our research strategy identified **three interdisciplinary themes** that guide all our current research activity tackling real-world challenges:

- ***Understanding health and wellbeing:*** We conduct research to understand people's experience of health, wellbeing and services, as they are born, live and age.

- ***Innovation in health and wellbeing:*** We develop and test interventions that promote healthy behaviours, effective and efficient health and social care, and better health and wellbeing outcomes, using randomised controlled trials, evidence synthesis and mixed methods research.
- ***Mobilising knowledge and improving service delivery:*** We work and research with a wide range of stakeholders, including people who use health and social care services, health professionals, service providers and policy makers with the aim to co-design for practice change and support service improvement.

These themes support our goal to transform health and wellbeing throughout the life-course and connect our research to UoD's strategic priority of embedding interdisciplinarity. Our structure allows us to align with external frameworks such as National Institute for Health Research (NIHR) core workstreams, the James Lind Alliance's Priorities and UK Research and Innovation (UKRI) delivery plans.

Four organisational clusters provide strategic leadership across our three interdisciplinary themes: the **Dental Health Services Research Unit (DHSRU)**, the **Mother and Infant Research Unit (MIRU)**, the **Scottish Improvement Science Collaborating Centre (SISCC)**, and the **People, Health and Communities Research Group (PHC)**. They lead on staff recruitment, coordinate mentoring and training, organising peer-review of grant applications, mock-interviews for fellowship applications, and seminars. They facilitate partnerships with other schools and external partners. They have contributed substantially to developing our major research projects and their associated networks facilitate dissemination activities and pathways to impact.

Below we present examples of our achievements over the assessment period within these research themes and how our research activity supports the continued vitality and sustainability of our approach.

### **Understanding health and wellbeing**

Essential to health and wellbeing of people are the environments in which they live. **Sixsmith** leads work aiming to improve older people's health, wellbeing and social engagement through understanding the role of technology, how older people experience and inhabit spaces and places, and encounter the end of life. Their participatory research has directly influenced development of age-friendly housing for older people with low incomes in Canada, and the design of long-term institutional care homes and pathways to policy have been established through a Housing and Ageing report involving politicians UK-wide. The PlaceAge project (**Sixsmith** co-investigator; ESRC, National Council for Scientific and Technological Development, Foundation for the Support of Research in the State of Rio Grande do Sul) resulted in age-friendly community initiatives in Brazil and India after collaboratively identifying barriers and facilitators to such communities.

Enhancing Lives through Participation, Activity and Rehabilitation (**ELPAR**), a team led by **Morris**, investigates community-based rehabilitation for cardiovascular disease and stroke. Their findings on rehabilitation after stroke and evidence-based physiotherapy practice have been incorporated into international guidelines (see Impact Case Study). Their interdisciplinary and collaborative approaches for knowledge creation and mobilisation challenge boundaries of traditional rehabilitation. Additional examples of their research are: a Doctoral Fellowship on increasing physical activity in care homes (**Morris, Wylie**, CSO, £24k) and development of a text-messaging service to promote physical activity after stroke (**Breckenridge, Farre, MacGillivray, Morris**, CSO, £297k).

Our focus on understanding the effects of social exclusion and marginalisation is a unique strength. **Beaton, Freeman, Yuan** have developed interventions for people in prison, experiencing homelessness, and those with a history of substance use. Their methods of co-design, co-production and communication analysis have been replicated in China, Italy, Norway and the US. Research in craniofacial anomalies and cleft lip and palate (CLP; **Mossey**) addresses a significant societal inequity in mortality due to social exclusion of individuals with CLP and their families in Low- and Middle-Income Countries (LMICs). We are contributing to international collaborative research to improve access to life-saving early surgery. Social justice in health and wellbeing is a priority which has grown through strong collaboration with the School of Social Sciences (van Blerk), investigating street children's experiences of violence (**McFadden**, Scottish Graduate School of Social Science PhD studentship), the impact of refugee displacement on secure and healthy futures of older people in Uganda (**Croudace**, internal SFC-Global Challenges Research Fund PhD award), and the "Growing up on the Streets" fellowship supported three African academics investigating the lives of street children and youth in African cities to translate evidence on poverty reduction into practice and policy (**Freeman, McFadden**, internal SFC-GCRF).

Cutting-edge hybrid primary-secondary data research has made planning our research more efficient and expanded expertise into social-epidemiological and psychometric domains. For example, **Boehnke** and **Croudace** investigated relationships between biomarkers and mental health, response styles in questionnaire behaviour, theoretical models of psychopathology and quality of life. Applied projects evaluated whether urban regeneration programmes improve community health and wellbeing (**Archibald**); the consequences of chronic illnesses using secondary analysis of qualitative data (**Farre**); used linked data sources to explore the epidemiology of child physical and mental health (**Marryat**; UNICEF Data for Children Collaborative) and routine administrative data to evaluate the Universal Health Visiting Pathway in Scotland (**Marryat**; Scottish Government). **Croudace** advised on the psychometric development of the "Recovering Quality of Life" instrument (ReQoL) for users of mental health services. ReQoL was included in the International Consortium for Health Outcomes Measurement (ICHOM) Standard Set for Psychotic Disorders which is expected to increase adoption and international impact.

### Innovation in health and wellbeing

Excellence in evidence synthesis underpins our development of innovations to realise the impact of midwifery globally. **Renfrew** led the development of the framework for Quality Maternal and Newborn Care (QMNCf) involving colleagues from five continents (Bill & Melinda Gates Foundation, see Impact Case Study), providing evidence-based characteristics of care needed to reduce mortality and improve experiences for women and babies. **Symon** leads research (Australia, USA, India) translating QMNCf into validated data collection tools. **Gavine, McFadden, MacGillivray, Renfrew** led the Cochrane review 'Support for healthy breastfeeding mothers with healthy term babies', the most downloaded update in 2017 and **McFadden, Renfrew** co-edited a Cochrane Special Collection of reviews on breastfeeding.

We are authors on 10% of the 214 Cochrane Oral Health reviews. In addition to intervention reviews we contributed to methodological development for diagnostic test accuracy reviews for dental caries (**Ricketts**). Involvement in Cochrane has supported career development of two researchers (**T.Lamont, Robertson**). The core outcome sets developed for effectiveness trials for caries and periodontal disease have informed ongoing trials and proposals related to James Lind Alliance priorities in Oral and Dental Health. Development of core outcome sets for multimorbidity prevention and treatment in LMICs (**Boehnke**, NIHR, supported by the Global Alliance for Chronic Diseases) continue this world-leading strategic work.

We presently lead six NIHR-funded randomised controlled trials evaluating clinical and cost-effectiveness of dental interventions. Published NIHR trials evaluated effectiveness of scale and polish (IQuaD, £2.4M, **Clarkson, T.Lamont, Ricketts**), recall interval (INTERVAL, £3.2M, **Clarkson, Ricketts**), and whether to fill children's teeth (FiCTION, £2.8M, **Clarkson, Innes**). These pragmatic trials utilised novel designs, involved patients and public at all stages, recruited 185 general dental practices, 5710 dental patients across the UK and collaborated with 10 HEIs. The results of IQuaD and INTERVAL challenge traditional dental care by concluding that a routine six-monthly check-up and scale and polish are neither clinically nor cost-effective. Findings were rapidly incorporated into Cochrane reviews which are informing guideline recommendations and government policy (see Impact Case Study). Ongoing trials evaluate novel digital technology for prevention in 3500 children (BRIGHT, £2.2M, **Innes, Robertson**), and new techniques for minimal dentistry (SCRIPT, £2.3M; PIP, £2M; **Clarkson, T.Lamont, Ricketts**).

Rapid Cochrane review updates avoid possible delays in evidence inclusion in guidelines of the Scottish Dental Clinical Effectiveness Programme (SDCEP), NICE and Public Health England and expedite implementation in practice. The unique partnership with NHS Education for Scotland (NES) and SDCEP (director: **Clarkson**) enables national trials of guideline implementation. One trial led to a 6% reduction in antibiotic prescribing in dentistry, influencing UK-wide and international guidance and similar initiatives in medicine (see Impact Case Study).

**ELPAR** (see above) aims to enhance the lives of people with impairments and disability through participation, activity and rehabilitation. The team has developed and tested podiatry interventions to reduce falls (**Morris, Wylie**, CSO, £182k); arts-based creative engagement in stroke rehabilitation (**Morris**, CSO, £138k); and whether family-based behavioural change interventions increase outdoor walking after stroke (**Morris**, CSO, £243k). **Rattray, Ramsay** lead research improving recovery from critical illness. They contributed to trials (RECOVER, CSO, awarded in previous period), patient web-resources, and are developing an evidence-based intervention and theory of change for UK-wide implementation to transform hospital discharge planning for ICU survivors (**Ramsay**, CSO, £26k), receiving recognition for impact in the 2017 Scottish NMAHP Research Awards.

**Mossey** leads 3D imaging research and deep phenotyping, utilising genome-wide association studies to understand the genetics of craniofacial morphology and anomalies. These enable pre-surgical volumetric analyses for bone grafts, intra-oral scanning, and development of an algorithm for automated dental study model scoring and contributes to an Impact Case Study in UoA10, demonstrating our interdisciplinary innovations and impact in measuring outcomes for CLP.

**Manica** leads the only research-focussed, evidence-based unit of Forensic Odontology in the UK, working closely with the Centre for Anatomy and Human Identification in the School of Science and Engineering, local police and Procurator Fiscal. Recent mass disasters and human migration highlight the importance of Forensic Dentistry in identifying victims and ageing of individuals. **Manica, Mossey** investigate craniofacial reconstruction in different types of malocclusion with clinical and forensic significance for human identification.

Drugs Harms Prevention Research (**MacGillivray, Munro**) has attracted significant funding and is a focus for strategic development. It tackles a real-life challenge to inform reduction of harms and premature deaths amongst people who use drugs, a population experiencing significant social, economic and health inequities. Collaboration with Drugs Research Network Scotland has resulted in funding (**MacGillivray, Munro**, NIHR, £333k, awarded February 2020) to understand contextual

factors impacting on effective provision of opiate substitution therapy and needle and syringe programmes.

**Freeman, McFadden** have international reputations for their innovative, co-designed and co-created research to improve health and wellbeing of marginalised groups (see Section 4), promoting social justice. Interventions adopted by practice include the Smile4life Programme for people experiencing homelessness and the peer-led Scottish Oral Health Improvement Programme to enable prisoners to actively care for their own oral health both inside and outside prisons, raising self-esteem and improving life chances. **McFadden, Innes'** exploration of how Gypsy, Roma and Traveller communities trust in health services can be increased (with **MacGillivray**; NIHR, £350k) underpinned the Scottish Government's Action Plan (Edinburgh, October 2019).

### **Mobilising knowledge and improving service delivery**

SISCC (**Gray**) evaluated the Scottish Quality and Safety Fellowship programme to build and translate improvement knowledge and skills at individual and organisational levels. SISCC led a knowledge exchange programme to foster a culture of transformative innovation in health and social care (**Gray**, Scottish Universities Insight Institute, a partnership of HEIs to support knowledge exchange, £16k) and worked with Healthcare Improvement Scotland to establish a Special Interest Group as part of the Health Foundation's Q Network. The 'Pharmacist and Data-Driven Quality Improvement in Primary Care' project (**Gray**) developed software to facilitate identification of patients at high risk of drug-related harm and a decision support tool to facilitate identification of drug therapy risks at individual patient level. This has been rolled out by the Scottish Government across all ~1000 general medical practices in Scotland. SISCC collaborated with academic institutes and the NHS to redesign the Primary Care Indicators Dashboard (**Clarkson, Gray**), aligning with Scottish Government priorities, and driving improvements in primary care practice.

**McFadden** led the development of an evidence-informed intervention comparing cue-based versus scheduled feeding for preterm infants in neonatal units (with **Gavine, MacGillivray**, CUBS, NIHR, £313k) and the co-production of an NHS-tailored implementation framework to support women in the UK to breastfeed with a focus on reducing health inequities (with **Farre, Gavine**, NIHR, £227k). A PhD studentship (**Gray, McFadden, Renfrew**, CSO, £72k) evaluated a new resilience-based model of supervision for midwives being considered for roll-out across healthcare professionals in Scotland. Impact on global guidance on feeding infants and young children includes the UNICEF/WHO Baby Friendly Hospital Initiative (**MacGillivray, Renfrew**, WHO, £31k) and WHO guidelines on counselling of women to improve breastfeeding practices (**Gavine, MacGillivray, McFadden, Symon**, WHO, £50k).

Our ongoing response to the COVID-19 pandemic focusses on translating the strengths of our "Understanding" and "Innovation" research themes into practice by producing rapid reviews and guidance for the profession (May-July 2020: 214,000 accesses; 30% international). SDCEP (**Clarkson**) drew on interdisciplinary expertise to provide UK Governments with evidence-based analyses of the mitigating factors necessary to facilitate the return to routine dental practice involving Aerosol Generating Procedures, changing UK government guidelines and receiving international interest (see Impact Case Study). **Freeman** investigated the emotional responses of dental care professionals in training and in primary care which is informing NES and Government (CAREER; NHS-funded); **Gardner** secured NHS Tayside COVID-19 funding to investigate the role of viral spike proteins in altered sensations of taste and smell (£40k; NHS Tayside).



**Supporting a culture of research integrity**

We are committed to the Concordat to Support Research Integrity and its implementation is overseen by the University's Research Governance and Policy Sub-Committee. Research Integrity Leads (**Gray; Munro**) promote a culture of research integrity, providing impartial advice regarding the responsible conduct of research. All research staff and postgraduate students receive online training on policies and ethical procedures relevant to research (institutionally mandated for postgraduate research students and recommended for supervisors). Our Joint Research Ethics Committee (chaired by **Symon**) reviews all non-clinical projects involving human participants, reports to the University Research Ethics Committee, and provides additional training to staff and students. The Tayside Medical Science Centre (TASC) sponsors and hosts clinical studies and works closely with the East of Scotland Research Ethics Service Committee, NHS Tayside and the Eastern Node of NHS Research Scotland.

**Open research environment**

The University is committed to fostering an open research environment. We access the support offered by the Library and Learning Centre to ensure our publications and theses are open access via the Discovery portal and that open research practices are aligned with the Concordat for Open Research Data are incorporated into our projects and grant proposals from the outset (e.g., appropriate data management plans and plans for stakeholder engagement). In 2020, each School created 5% FTE roles of Open Research Champions (**Fang; Cassie/Gardner** sharing). They lead the development of an interdisciplinary culture of transparent dissemination of research and reproducibility, promoting and supporting the institutional Open Research Policy and Strategic Aim 5 (below).

**Future strategy**

Our strategic aims over the next 5 years incorporate our success over the assessment period in creating critical mass in key areas of our research.

**Strategic aim 1: Grow areas of specialist expertise and expand existing excellence for world-leading and impactful research**

Our ambition is to capitalise on our success through development of our three interdisciplinary themes with topic-led research teams: these are **Mother and Infant Health** (Farre, Gavine, Gray, Marryat, McFadden, Renfrew, Symon); **Drugs Harms Prevention** (MacGillivray, Mohan, Munro); **Mental Health** (Boehnke, Croudace, E.Lamont); **Rehabilitation** (ELPAR: Breckenridge, Fulton, Morris, Wylie; intensive care: Ramsay); **Healthy Active Ageing** (Archibald, Buell, Fang, Gamble, Sixsmith); **Effective Dental Care** (Bearn, Cassie, Clarkson, Innes, T.Lamont, Ricketts, Robertson); **Oral Biophysical and Forensic Sciences** (Gardener, Macluskey, Manica, Mossey); and **Dental Public Health** (Beaton, Freeman, Yuan). We will build on our success in acquiring funding (NIHR/CSO) and prioritise interdisciplinary research with strategic partners, including HEIs, health and care services and industry, to respond to the agenda of the UK R&D roadmap and the focus on research to recovery post-COVID-19. We will align external funding opportunities to help address the substantial global challenges post COVID-19 (GCRF/ODA). We will contribute to the vision of the Tay Cities Deal to develop a Biomedical Innovation hub for applied technologies and JustTech, the world's first institution for Innovation in Forensic Science. Our activities in research, training and securing sustainable funding will focus on laying the foundation for a responsive, interdisciplinary health science programme with world-leading areas of specialisation.

**Strategic aim 2: To formalise the designation of The Dundee Dental Research Hospital and School (DDRHS)**

We have a track record in research to improve evidence-based dental care and on improving oral health of marginalised groups. Dundee Dental Hospital and School is an important part of the local NHS with approximately 60,000 patient visits a year. This large footfall provides an opportunity to place clinical research projects at the centre of our work and to be agile and responsive. By engaging with NHS and University staff and students, every patient seeking care can potentially contribute to research and our understanding of quality improvement. Our research into the causes of CLP, oral cancer, impact of viruses on oro-nasal sensation, and forensic dentistry will all contribute to the vibrancy of the Research Hospital and School. The vision is that DDRHS becomes the first Dental Research Hospital and School in the UK, enhancing Dundee's reputation for oral and dental research.

**Strategic aim 3: Build a vibrant interdisciplinary programme of research addressing inequities in health**

Our staff mix and research portfolio show success in embedding interdisciplinarity as a key value into our programme. We have invested in our staff portfolio to further increase our capacity for a responsive and participatory research programme. We classified 38% of our submitted outputs as "interdisciplinary". We will continue this focus on interdisciplinarity to develop a coherent approach to addressing inequities in health. This will align with the Sustainable Development Goals 3, 5 and 10 (good health and wellbeing, gender equality, and reduced inequalities), and the University's Interdisciplinary Theme of "Promoting social change to enhance diversity, justice and socio-economic prosperity". Our approach strengthens international networks to deliver high quality interdisciplinary projects co-producing new knowledge and impact addressing inequities. Future internal peer review of grant applications will include consideration of their alignment with this strategic aim.

**Strategic aim 4: Build capacity and leadership for sustainability**

A strategic approach to building capacity and leadership will underpin our growth of excellence in health sciences research (Strategic Aim 1). Since 2014, investment in key senior appointments and in ambitious early career clinical and non-clinical researchers (see Section 2) has strengthened our research environment. We will support them to build collaborative research programmes to expand and develop our areas of excellence. Aligned with the Concordat to Support Career Development of Researchers, we will continue to provide opportunities for specialist training and mentorship (e.g., Advance HE Aurora Leadership Programme and Research Team Leadership programme, European/Scottish Crucible). We commit to ensuring staff development funding continues to be allocated equitably across all staff groups with a particular focus on strengthening research leadership. Based on our 54% increase in PhDs compared to the previous period, we also aim to increase our PhD student numbers by 50% for a vibrant and sustainable postgraduate community.

**Strategic aim 5: Prioritise an Open research environment**

Our research is designed to make a difference to those living and working in the community and to inform key health and social care decision-makers. Our ambition is to increase the impact of our research by expanding access for global users. Appropriate guidance for, and consistency of open research practice ensures that beneficiaries of research knowledge have access to up-to-date information to facilitate impact. We will continue to develop a proactive culture around the dissemination of our research into the public sphere, by: facilitating best-practice approaches for our interdisciplinary environment to make outputs, data and other products of our research publicly available, building on our University's Open Research Policy and infrastructure (Discovery & Information Services); building on our research experience in knowledge mobilisation, and

stakeholder and patient and public involvement; and contributing to initiatives investigating or contributing to the reproducibility of research. We will use innovative integrated knowledge mobilisation principles to ensure that our research is available, accessible, and useful.

### Facilitating Impact

Achieving impact is central to the University's mission of transforming lives locally and globally and our Impact Champions (**Freeman, McFadden**) are instrumental in implementing plans for impact at the inception of projects. Our projects are co-developed with stakeholders and beneficiaries outside the academic community. Patient and public involvement is integral to our strategy. We strive to integrate service-user and carer voices, e.g., through co-investigator roles, participatory co-design approaches, community co-researchers, service users as members of advisory boards and service user panels. Strategies to ensure representation from seldom-heard communities include working closely with civil society and community-led organisations supported by training and payment for lay representatives. Collaborative approaches underpin our research and facilitate success in achieving meaningful and measurable impact. Such impacts will include policy and practice change, timelier and more efficient implementation of research findings, and will be recognisable to collaborative partners as addressing the issues raised.

Our extensive networks and partnerships (see Section 4) and the involvement of clinical academics (see Section 2) ensure that we maintain a focus on practical problems that matter to policy makers, practitioners, service users and wider society. We will maintain our close links with global organisations through disseminating and implementing research (Cochrane, WHO, UNESCO). Noteworthy are the successful engagement of **McFadden** and **Renfrew** with the WHO resulting in contributions to guidelines; **Mossey's** strong connections with WHO and the International Association for Dental Research; **Clarkson** as co-editor of Cochrane Oral Health and her leadership of SDCEP and TRiADS, producing clinical guidelines and implementation with global reach. We will build on innovative approaches to reflect on and develop the impact of our research, such as **Sixsmith's** "Healthy Universities for Healthy Communities: Bridging the Divide" project (Scottish Universities Insight Institute), which explored with community groups and members of the public ways that universities could improve how they share important public health research.

## 2. People

### Staffing strategy and staff development

The excellence and diversity of our staff underpin our success, reflecting our commitment to being supportive, inclusive and collaborative. We enable staff at all stages to exploit opportunities and fulfil their potential. Building for the future, we embed interdisciplinarity and are committed to Equality Diversity and Inclusion (ED&I).

### Investigators

We have a critical mass of highly motivated researchers with the skills and collaborations to take forward our research strategy. Colleagues are distributed across age brackets (30% under 40 years; 56% between 40-60 years; 14% over 60 years) with approximately 65% women, and three identifying as BAME. With 95% of contracts being open-ended/permanent and returned staff at a mix of career stages (19% professors; 22% senior lecturers or readers; 59% lecturers or equivalent), we have created a sustainable, vibrant research environment with specialised senior expertise and Early Career Researchers (ECRs; 41%) developing their research towards becoming leaders in their fields. Our strategic approach to succession planning and capacity building includes mentorship, thematic alignment, and support for those earlier in their careers



towards increasing independence. We are committed to the principles and implementation of the Concordat to Support the Career Development of Researchers and the QAA Code of Practice for Research Degree Programmes.

### Recruitment

We have invested in key professorial appointments (**Croudace, Sixsmith**) and promotions (**Innes, McFadden**) to consolidate core areas of our research profile. We invested in additional research leadership through senior appointments with specialist expertise (**Boehnke, Morris**). **Ramsay** is an excellent successor to **Rattray**, further developing our profile in intensive care nursing and rehabilitation. The University invested in the Baxter Fellowships Programme which is a fast-track academic cohort expected to achieve promotion to Reader or Chair level with augmented support and mentoring within five years. We were awarded two Baxter Fellowships (**Cassie, Marryat**) and we have appointed 13 Category A staff since January 2019. The involvement of the leads of our organisational clusters aligns all appointments strategically to our three research themes, ensuring growth within a coherent programme of research. Our current profile reflects these strategic decisions in quantity as well as in composition: during the assessment period our FTEs have increased 50% (23 to 34) and ECRs over 300% (4 to 15), evidencing our commitment to increasing capacity and sustainability.

The University's established approach to recruitment ensures transparency and fairness. Appointment panels follow a UoD policies and procedures standard, comprising senior school representatives, a representative from outside the schools to ensure consistency, and balanced gender representation. As SDEN and SHSC hold Athena SWAN Bronze Awards, a strong focus in recruitment is fairness. All appointment panel members undertake ED&I and unconscious bias training.

A key part of our strategy is to grow research capacity and capability in clinical practice contexts. **Sixsmith** co-leads the Palliative and End-of-Life Care Research Group in Tayside, which provides research training, writing workshops, and develops collaborative research proposals. We offer fixed term secondments for staff from the NHS interested in academic careers, providing mentorship, support and time to develop research proposals and outputs. They are supported to apply for research grants (e.g., Wellbeing of Women Entry Level Scholarship for Midwives awarded). **Breckenridge** is a clinically embedded researcher, half-funded by the NHS, to grow allied health professional research capacity and capability. Three NIHR-funded Health Technology Assessment (HTA) trials have a clinical academic trainee working with **Clarkson** (one completed: **T.Lamont**). Over a period of six to eight years, this training combines hands-on experience of management and leadership of HTA trials with clinical training to NHS Consultant and placements with Scottish Government (Health). The funding for this training is joint between the HTA trial, NES and SDEN.

### Career support and development

The University has an extensive Organisational and Professional Development programme mapped to Vitae. To enable our staff to flourish, individual development needs are identified annually at Objective Setting and Review (OSaR). Line managers help staff to identify development opportunities, including access to coaching for effective career development and programme leadership. There is a formal process for applying for sabbaticals across career stages and financial support to enable staff to attend conferences and training (incl. with caring responsibilities). Probationary staff are given additional 10% dedicated workload allowance to develop their academic role and profile. Available resources for career and research development are frequently advertised. Internal roles are advertised to all staff, offering opportunities for

personal development and strengthening CVs. We have the ambition to increase our financial commitment to starter packages and other opportunities to support researchers to grow into independence. We also make the financial commitment to enable ECRs to apply for substantial career development such as UKRI Future Leaders Fellowships.

We actively celebrate notable achievements in research outputs, grants won, and impact activities through school boards, social media and Deans' messages. The Annual Research Review for all research academics feeds into OSaR. We strategically build on excellence to enhance our performance and reputation. Where an academic's performance is below expectations, action plans are developed with clear and achievable outcomes. All researchers are offered career and promotion planning by our leadership teams and line managers who proactively encourage and support engagement with the promotion process. Both research achievement and research impacts are included in promotion discussions. Of our Category A staff, one has been promoted from Lecturer to Senior Lecturer; one from Senior Lecturer to Reader, and two from Senior Lecturer to Professor in the assessment period.

Each new member of staff is assigned a research mentor who helps them develop their research profile within the school. Leads for organisational clusters coordinate mentoring and training, organise peer-review of grant applications, and mock-interviews for fellowship applications. All researchers are encouraged to participate (as mentors and mentees) in the cross-institutional Teaching, Research & Academic Mentoring Scheme and in opportunities such as UoD's 'Developing Leaders' programme (**Croudace, Gray, Mossey**), the invitation-only NIHR Future-Focused Leadership Programme (**Croudace**), Advance HE Aurora Leadership Programme for women (**Marryat, Mohan**), Advance HE Research Team Leadership programme (**Breckenridge**) or the European/Scottish Crucible (**Marryat**).

### **Postgraduate research students**

Training the next generation of health researchers from diverse backgrounds is a priority for us. Our completions have increased by 54% compared to the previous assessment period (35 to 54). Of these students and our 44 active PhD students, 61 are from overseas, two from the EU and the remainder from the UK.

### **Monitoring and support mechanisms**

Postgraduate research (PGR) students are supported by a higher degrees lead, a team for higher degrees including academic and professional services staff and the University's Higher Degrees Quality Code. Students have two accredited supervisors, often with an ECR supervisor working towards accreditation. They meet with supervisors at least once a month. Thesis Monitoring Committees (three Category A staff) convene twice a year. TMCs oversee progress and contribute to decisions such as upgrade to PhD status and advise supervisors of any concerns, supporting students with supervisory issues. Supervisors support publication plans and encourage students to present and publish their work. We increase interdisciplinarity and supervisory capacity through co-supervision with colleagues in other Schools (Science and Engineering, Mathematics, Centre for Human Identification and Anatomy, Education and Social Work, Social Sciences, Medicine, Art and Design).

### **Skills, career development and integrated research student culture**

Supervisors support students to identify the most suitable training opportunities, including research management, research integrity, thesis writing, post-doctoral planning, and academic skills. Students are encouraged to apply for external funding and can apply for internal funds. Students present their work in the monthly Postgraduate Research Forum, attend our research seminar

series, research meetings, and future-focussed activity such as our research planning days. There are dedicated organisational roles for PGRs (e.g., representation on committees, the Athena SWAN application group, seminar co-host) and we increasingly involve PGR students in research grants. We host an annual student-led PGR symposium, building skills in presentation and conference organisation. PGRs are also involved in our Annual Research Showcase engaging with other Schools and the public and we encourage them to present at external conferences.

To build a cohesive interdisciplinary connected community, UoD's Doctoral Academy coordinates all aspects of the research lifecycle of PGRs and supervisory support. SHSC is part of the Graduate Community for Social and Health Sciences (together with the Schools of Social Science and Education and Social Work) and the Institute for Social Sciences Research (ISSR, **Sixsmith**, co-director), a collaboration with the Schools of Social Science, Education and Social Work, and Business. Both provide PGR training, seminars and networking opportunities. They also connect us with the Scottish Graduate School of Social Sciences (SGSSS), offering students the opportunity to engage with its PGR training opportunities.

### **Evidence of support for equality, diversity, inclusion**

Both schools have ED&I Committees reporting to the School Executive Groups and the University ED&I Committee. They are chaired by senior academics with membership that represents all staff groups, students, representatives for protected characteristics, and the UoD ED&I officers. The committees lead implementation of ED&I action plans, monitoring progress against these and the Athena SWAN action plan, strengthening our ED&I culture. Examples of ED&I promotion include the use of a dedicated email address to promote school-wide communication, ED&I as a standing item on all committee agendas, ED&I module completion monitored through OSaR, with completion being a pre-requisite for probation and promotion. A statement surrounding valuing people and their contribution is present in OSaR and an Equality Impact Assessment is undertaken during the QA process for all activity. Consideration of ED&I is a crucial part of recruitment and induction of all new staff, as well as the support and ongoing development of staff and students.

Monitoring of gender equality in all processes is a major component of our Athena SWAN action plan, and with **Clarkson** receiving the Fletcher of Saltoun Award (Saltire Society) and **Renfrew** as the first midwife and nurse to be elected to Scotland's National Academy, we count outstanding women scientists among our researchers. We are committed to rewarding staff fairly and equitably and continue to work towards reducing our gender pay gap. The Schools aspire to the Athena SWAN Silver Award. We actively support the University's plan to submit a Race Equality Charter application.

We strive to support all staff with reference to their individual needs. Line managers engage with the HR flexible working process, which includes annualised leave, carer's leave, temporary part-time working and phased return from sickness absence. Staff trained as first responders for mental health and first aid, support the academic community. Staff are encouraged to disclose disabilities and we have supported adjustments to working environment (allocation of office space, accessible parking), software and office equipment (standing desks). Staff on maternity leave are encouraged to use Keep in Touch (KIT) time to retain contact with their colleagues. UoD has a Shared Parental Leave policy for supporting partners. We follow Athena SWAN principles ensuring core meetings are scheduled between 10am-4pm. Since the restrictions imposed by the pandemic, we have supported flexible working, enabling staff and PGRs to work around the requirements of home schooling or caring responsibilities. Staff were supplied with appropriate equipment to enable them to work effectively at home (e.g., headsets, laptops, additional screens, chairs, internet dongles). We introduced weekly and then fortnightly catch ups for staff and line managers, to promote and

translate our collegiate culture into the new ways of working. Extensions and discounted time were offered to PGRs as well as support for mental health and general wellbeing. Virtual research events attracted high numbers of staff and students.

### Construction of REF return

For our REF return, Impact Case Studies were identified through the ARR which encourages staff to detail potential impact, two development workshops in which several case studies were explored, and discussions at the Research Committee. The returned three reflect the strongest impacts arising over the REF period as deemed by our UoA3 Planning Group. Outputs have been selected and attributed to individual staff by our Planning Group to maximise the overall quality profile for the submission. Outputs were reviewed over the period for the ARR process and feedback from researchers on their publication and grading profile was regularly requested. The proportion of outputs attributed was broadly consistent with the gender balance of the UoA and 80% of our appointees since January 2019 have been women, most of them ECRs. All Planning Group members completed unconscious bias training in addition to ED&I (incl. REF-specific training) and information security awareness training. Our institutional Code of Practice was always adhered to.

## 3. Income, infrastructure and facilities

### Research income

Over the assessment period our researchers were PIs or co-investigators for grants totalling over £25.1M and a net value income to the submitting unit of £14.2M. Most funding came from UK government bodies/local authorities, health and hospital authorities (£6.5M) and UK Health Research Funding Bodies (£5.0M). These sources accounted for 45% and 35% of our average annual research income and UK-based charities accounted for 8%.

Notable income and new awards during the period led by our researchers (total award amounts):

BRIGHT	£2.2M NIHR ( <b>Innes, Robertson</b> )
REFLECT	£2.0M NIHR ( <b>Clarkson, Ricketts</b> )
SCRIPT	£2.3M NIHR ( <b>Clarkson, T.Lamont, Ricketts</b> )
PIP	£2.0M NIHR ( <b>Clarkson, T.Lamont, Ricketts</b> )
ChildSmile	£135K Scottish Government annually ( <b>Freeman</b> )

and £624k NIHR (**MacGillivray, Munro**; awarded February 2020) on effective provision of opiate substitution therapy and needle exchange.

**Clarkson, Ricketts** and **Freeman** are co-investigators on externally-led NIHR trials awarded a total of £7M (£1M to Dundee) to assess drug and public health interventions for high-risk adult and child patients. **Boehnke** and **Croudace** are methodological leads on externally-led NIHR PGfAR and DFE-funded studies evaluating public mental health and service interventions for severe mental illnesses and chronic conditions awarded a total of £6M (£104k to Dundee).

We will build on our NIHR funding successes and prioritise interdisciplinary research proposals to respond to the agenda of UKRI. All staff are expected to apply for funding and receive recognition for this in the ARR.

### Nature and quality of infrastructure

The University provides human, physical and digital infrastructure to support world leading and internationally excellent research and innovation. A critical component of our success is the quality

of our human infrastructure working with excellent internal and external partners. Research support services include an administrative lead in each School with a team supporting grant costings, financial reporting, research committees, peer review activity, and research degrees. We use the OneDundee approach of partnership working across Schools and between academic and professional services colleagues. The University investment in digital readiness and universal IT systems has provided support and efficiencies. Discovery, the research and information system, provides a public-facing repository of research activity and outputs. This has stimulated PhD studentship requests and contact with potential research partners. All researchers have access to our research infrastructure and grant opportunities are publicised by the research office and ADRs, who serve as point of contact and organise demand-managed application processes. Researchers work directly with UoD's Research and Innovation Services (RIS) and with the Research Finance Office. RIS supports the delivery of our strategy especially by targeting larger grants and sharing learning and experience with application processes.

The integration of University health research with NHS-based research and services has had significant impact on our clinical and evidence implementation research. The Tayside Medical Science Centre (TASC) provides infrastructure and governance support for clinical trials and the Tayside Clinical Trials Unit (TCTU; UKCRN accredited) was recognised for the "gold standard" of its clinical research (2017) by the UK Clinical Research Collaboration, providing pre-award design and methodology support. TASC also provides sponsorship, standard operating procedures and guidance for conduct of clinical studies. The Health Informatics Centre is an ISO27001 certified research environment (SAFE HAVEN) with extensive expertise, including in governance approval, software development, data linkage, and data entry and its services. Together with the UoD IT systems team and the Library and Learning Centre they provide crucial infrastructure and advice for project planning with sensitive personal data.

### **Mechanisms for promoting research, sustaining and developing a vital research culture and delivering impact**

Our physical infrastructure and spaces permit communal activities for groups and our multipurpose, digitally supported spaces provide the opportunity for interactive training and sharing of research. We organise monthly seminars with external and internal speakers and research development days. These activities foster vibrant interdisciplinary unit-level interaction and discussion between academic staff, post-doctoral researchers and PGRs, providing an excellent opportunity for ECRs to grow their networks. We celebrate women in science, with the June Nunn (SDEN) and Rebecca Strong (SHSC) lectures in alternate years. Annual symposia of presentations, posters and short talks are held in central University buildings and promote academic and social interactions. Our researchers actively participate in the Dundee Interdisciplinary and Innovation Forum (DIIF) and those focusing on major societal challenges and events relating to the Global Challenges Research Fund (GCRF; internal panel members: **Boehnke, Mossey**). To mitigate reduced access due to the pandemic, we moved these formats successfully online, a development that also integrated our international and part-time students more effectively. While we look forward to returning to our university environments, we trialled new and effective ways of community building that will be retained beyond the pandemic.

We have focussed on increasing the PGR population. We invested in three PhD 'hubs' with a total of 40 designated workspaces (not all students are on campus). One of those is dedicated for students involved in 'Data Science' and is their principal workspace. These hubs provide a supportive and collaborative environment, reducing isolation, improving a sense of camaraderie and promoting a positive place to study, which is particularly important for our international students.



In SDEN where the discipline is made up of a combination of basic, clinical and human science, we have invested in upgrading a suite of laboratories supporting cell and molecular biology, microbiology and materials/physical sciences. These laboratories are run by a mix of clinical scientists and non-clinicians and supported by a team of experienced technicians. Access to specialist facilities in other Schools has increased multidisciplinary research and a vibrant culture. This allows us to support clinical PGRs training in basic sciences. A measure of success is that between academic years 2014/15 and 2019/20 48 PhDs were awarded to clinical scientists from the two schools.

The excellence of our research is enriched by the distinctive features of our four organisational clusters:

- **Dental Health Services Research Unit (DHSRU; Co-Directors Clarkson, Freeman)** leads more NIHR-funded trials in dental primary care than any other HEI. The academic leads are supported by additional University and externally funded staff (one trial manager, six trial administrators, six research nurses and hygienists). The collaboration between the University, NHS Tayside and NES created physical space for office accommodation of staff from each organisation. With significant capital funds from NES this space has inspired and produced internationally recognised research to be embedded within service delivery at a national level. DHSRU houses the Centre for Evidence Based Dentistry, promoting teaching, learning, practice and evaluation of evidence-based dentistry. DHSRU staff working alongside the NES-funded Scottish Dental Clinical Effectiveness Programme of eight researchers and six administrators (SDCEP <https://www.sdcep.org.uk/>; **Clarkson**) supports dental teams throughout Scotland by providing user-friendly, evidence-based guidance for priority topics in dentistry in Scotland. The Translation Research in a Dental Setting (TRiADS: <http://www.triads.org.uk>; **Clarkson**) programme has developed an innovative and evaluative knowledge translation framework to inform, support and influence delivery of evidence-based practice in dental primary care. With NES contributing on average £100k to annual research and personnel cost, the programme of research is undertaken with other national and international HEIs and the NHS to improve the quality of dental care. SDCEP and TRiADS have had a significant impact in Scotland, the wider UK and internationally, as described in the Impact Case Study "Addressing Priorities". The DHSRU-housed "Oral Health and Health Research Programme" has established creative partnerships to produce ground-breaking work on understanding oral health inequities and social exclusion in those experiencing homelessness, imprisonment and substance use (**Freeman**). New theoretical positions such as 'inclusion oral health' and an intersectional perspective on oral health underpin an interdisciplinary research programme featuring in an Impact Case Study with Social Work (UoA20).
- The **Mother and Infant Research Unit (MIRU; Director Renfrew, now McFadden)** investigates health education, promotion and protection with a specific focus on effective support for breastfeeding, and the organisation, quality and experiences of maternity care nationally and globally. Key foci of MIRU are reducing inequities in access to services and in maternal and newborn health outcomes. MIRU's research enabled non-governmental organisations to advocate for midwifery and resulted in governments mandating the implementation and strengthening of international-standard midwifery (see "The Lancet Series"). This work also underpinned MIRU's leadership on the development of the 2019 NMC 'Standards of Proficiency for Midwives' (**Renfrew**, Nursing and Midwifery Council-appointed lead). These standards state the knowledge and skills required for eligibility to

join the NMC register as a midwife in the UK, forming the basis for the education provided by approved education institutions and their practice learning partners.

- We are grant holders and hosts for the **Scottish Improvement Science Collaborating Centre (SISCC)**, a five-year, in total £3.75M grant from the Scottish Funding Council, Chief Scientist's Office, NHS Education for Scotland and the Health Foundation with substantial additional investments from partner organisations. This is a strategic alliance between six HEIs in Scotland, four national service providers, the 14 regional health boards, and third sector organisations. SISCC (Director: **Renfrew, Clarkson**; now: **Gray**) bridges the gap between academia, public, practitioners and policymakers to enhance quality, safety and person-centred care.
- The **People, Health and Communities Research Group (PHC)**; led by **Sixsmith**) considers environmental, community, behavioural and socio-psychological aspects of health and wellbeing, rehabilitation and recovery in adults with long-term conditions (mental and physical). Research focuses on the development and evaluation of complex behavioural interventions and on the implementation of research findings into health, social care and community settings. PHC houses multi-centre collaborations and our emerging teams **Drugs Harms Prevention, Mental Health, Rehabilitation and Healthy Active Ageing** (Strategic Aim 1). Collaborations with service and stakeholders lead to impact as presented in the Impact Case Study "Improving physiotherapy practice".

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

##### Effective collaboration at the national and international level

Our research culture is fundamentally open and collaborative. The evidence of impact and reach of our work demonstrates that we have consistently 'punched above our weight'. We have described in Section 3 how in particular DHSRU and SISCC facilitate collaboration, working with other HEIs and service partners. Our strategic relationships with other HEIs have stimulated more ambitious projects and success with national funding. We are major contributors to the Scottish Oral Health Research Collaboration (SOHRC). SOHRC increases collaboration between Scotland's three undergraduate dental schools and the Edinburgh Dental Institute. It builds critical mass by bringing together Scotland's leading oral health researchers to deliver high-quality research that supports the needs of Scotland's population, focusing on Dental Public Health and Health Services Research, Craniofacial Anomalies Research and Dental Education Research. It supports the development of PGRs through supervision by a shared group and regular opportunities to network at national meetings. A biannual SOHRC conference is held with keynote speakers and activities such as three-minute presentations by PGRs. The active involvement of NHS Scotland Chief Dental Officer, SFC, CSO and NES further strengthens collaboration and promotes a multidisciplinary vibrant culture.

We embrace UoD's international strategy, and our researchers participate several times per year at internationally facing events (e.g., ISSR, DIIF). Our training of overseas PhD students has been an effective mechanism for developing international collaboration. One of UoD's strategic areas for research collaboration and impact is South Asia, which features strongly in our research. MIRU has a memorandum of understanding with Jamia Hamdard University organising capacity building initiatives and researcher training with five Indian research institutions (New Delhi, India; **Symon; McFadden** honorary adjunct professor; MRC, internal SFC GCRF). **McFadden** is a member of an international midwifery expert group advising the Government of India on the implementation of midwifery. **Boehnke** is co-investigator of a NIHR Global Health Research Group, building networks

and capacity for mental health services research and epidemiology with partners in Bangladesh, India and Pakistan (NIHR, £2M; £16k to Dundee).

**Mossey** is the chair of the Global Task Force on Cleft Lip and Palate (CLP) research, leading a research and implementation agenda aiming to prevent congenital anomalies by prioritising public health primary prevention. Among other international efforts (incl. India), he established the African Craniofacial Network “Africran”, a multicentre international collaborative initiative (University of Dundee, University of Iowa (USA), National Institute of Health (NIH, USA), Smile Train) to deliver the first genetic and gene-environment interaction study in sub-Saharan Africa. This collaboration has since become the hub of CLP genetics and genomics research on the African continent. In Europe, Mossey leads collaborations such as the “EUROCleftNet” (€422k, European Science Foundation) network which has achieved pan-European collaboration on the investigation of risk factors and possible preventative strategies in the field of CLP. He also led the application to the European Commission to establish non-syndromic clefts of the lip and palate as rare diseases when the European Reference Networks were established in 2016. He hosted the WHO Oral Health and Craniofacial Anomalies Collaborating Centre until 2018 and continues to inform WHO policy in this area as an expert advisory partner.

Our research with marginalised populations (**Freeman, Innes, McFadden, Munro**) builds on collaboration with a wide range of partners. National partners include NES, Scottish Prison Service, SQA, NHS Scotland, Pathway, Shelter Scotland, Homeless Action Scotland, Positive Prison Futures, the Scottish Drug Forum, Way Hame Scotland, Action for Children. International collaborators include the University of Turku, Finland; Pontifical Catholic University of Rio de Janeiro; Federal University of Fortaleza, Brazil; and the Ministry for Primary Health Care, Palestine. Based on her research with Gypsy, Roma and Traveller communities (with **Innes**), **McFadden** served as an expert witness at the Gypsy, Roma and Traveller Health, Women and Equalities Select Committee (Westminster, April 2018) and the Scottish Government Working Group on Gypsy/Travellers (Edinburgh, December 2018). Our continued engagement with national and international partners is a cornerstone of past and future success.

We arrange opportunities for scientists to spend time with our research groups, including hosted sabbaticals (e.g., Marshall, University of Huddersfield; Altsveit, University of Stavanger, Norway). Collaborations have been catalysed following fellowships and exchange visits for researchers from Australia, Brazil, Lebanon, Hong Kong, Gaza and PhD training partnerships with Saveetha University (India) and Nanjing University (China). **Freeman's** research programme has attracted 10 international academic visitors in various visiting roles including a 12-month attachment funded by the CARA Trust and GCRF funding. **Freeman** and **Yuan** have established strong links with the University of Nanjing and Central South University in China. **Clarkson** works closely with New York University advising on clinical trials and clinical guidance production, and collaboration with the University of Boston has resulted in a US NIH-funded project to replicate the NIHR SCRIPT trial. **Morris** is a founding member of the International Stroke Rehabilitation and Recovery Alliance.

### Wider contributions to the economy and society

We have developed relationships with key research users to generate impact. Our trials in routine clinical practice shed light on the clinical- and cost-effectiveness of treatments. They provide evidence to support uptake/continuation/discontinuation of treatments that have become routine in the NHS. Our leadership on the 2019 NMC 'Standards of Proficiency for Midwives' (Section 3) and our research in response to the pandemic (Impact Case Study "Addressing Priorities") make contributions to both economy and society, but also to the sustainability of the respective disciplines and professions. We have developed initiatives that connect researchers and partners

world-wide to facilitate best practice and reduce research waste (**Clarkson**: Global Evidence Ecosystem for Oral Health; Cochrane Oral Health Global Alliance). Our rapid production of robust systematic review evidence is linked to policy makers and guideline developers for quick adoption and implementation. Our three Impact Case Studies present world-leading examples from our research programme, with global impact on health services, key outcomes related to UN Sustainable Development Goals (3-good health and wellbeing, 5-gender equality, 10-reduced inequalities), and patients' and people's lives.

### Public engagement

We are strongly committed to public engagement and outreach activities to inform the public about science and our research. We engage with schools, local communities, strategic patient and public partners across health and social care, priority groups including those who are homeless, in prisons and drug users. Our research has benefited from patient and public involvement and all trials include patient representation at each stage. Patient participation in the training of new interventions to trial clinicians has been innovative and productive. **Freeman** leads SDEN's Public Engagement Network and was part of the working group that delivered the University's Public Engagement Strategy. We are active in widening access programmes and provide pupils from local schools with work experience. Activities to promote the application of males to traditionally female dominated professional courses (nursing, hygiene-therapy) have been Scotland-wide.

We hold an Annual Research Showcase, engaging with partners across UoD and our region. Senior staff engage and support students to lead public awareness campaigns in the community and on campus for mouth cancer, gum health and oral care. Public performances at local Café Science events and the Edinburgh Fringe (**Clarkson**; 2015-2018) reach interested audiences. Innovative solutions to engage with audiences include designing comics to promote oral health amongst drug users, producing videos to instruct parents and carers of young children of effective oral care, and contributing to soup kitchens to promote oral health and provide needed products which are sourced from industry, local charities and dental practices. Our work featured in the University's submission to the Engage Watermark from the National Co-ordinating Centre for Public Engagement (NCCPE).

### Indicators of wider influence on the discipline

UoA3 colleagues shape the direction of the field in a variety of ways, contributing to societal and economic benefits by leading on the translation of empirical research into policy and practice.

- NICE Implementation Strategy Group, NIHR/CSO Oral and Dental Specialty Lead Scotland, Director Scottish Dental Clinical Effectiveness Programme & Scottish Dental Practice Based Research Network (**Clarkson**); NICE Expert Panel Member Maternal and Child Nutrition (PH11) & Member Healthy Start Expert Reference Group 2014/15, WHO Expert Panel Member Guideline Nutrition Actions (**McFadden**); Public Health England Delivering Better Oral Health (**Clarkson & Freeman**).

### Senior office bearers

- Trustee Governing Board Cochrane (**Clarkson**); European Cleft Organisation (**Mossey**).

### Membership of grant and fellowship awarding bodies

- NIHR Panel & Deputy Chair, Personal Transitional Research Fellowship, Career Development Award, Senior Research Fellowships Award, NIHR Panel: Advanced Fellowships Awards, Applied Research Collaborations Competition, ESRC Peer Review College, Health Research Board Ireland Emerging Investigator Awards (**Croudace**);

Commonwealth Scholarship Commission (**McFadden**); Research Council Norway (**McFadden & Clarkson**).

### Fellowships and other awards

- Fletcher of Saltoun Prize Saltire Society, IADR Trendley Dean Senior Scientist Award, Honorary Fellowship Faculty of General Dental Practitioners RCSEng (**Clarkson**); Physical Activity in Health Alliance Award (**Morris**); Fellowship Royal Society of Edinburgh (**Renfrew**).

### Honorary University positions

- York, Senior Research Fellow, Anna Freud National Centre for Children and Families, Collaborator (**Boehnke**); New York, USA, Professor (**Clarkson**); Universities of NanJing, China & Central South, China, Professor (**Freeman**); Turin, Italy, Professor (**Manica**); Edinburgh, Research Fellow (**Marryat**); Jamia Hamdard University, India, Adjunct Professor (**McFadden**); NanJing, China, Professor (**Yuan**).

### Chair and Leadership of International and national committees

- United Kingdom Public Health Register, Board (**Freeman**); International Confederation of Alcohol, Tobacco and other Drug Research Associations (**Mohan**); International Implementation Science in Rehabilitation Group & Scottish Stroke Allied Health Professions Forum (**Morris**); WHO Global Burden of Disease CLP, FDI/GSK Smile Train on CLP, Global Task Force CLP, IADR Science Information Committee, IADR Global Oral Health Inequalities Research Network (**Mossey**); Best Start five-year plan for maternity and neonatal care (**Renfrew**); Tayside Palliative and End-of-Life Care research group (**Sixsmith**); International Association for Communication in Healthcare - Oral Healthcare (**Yuan**).

### International and national committee Member

- NHS England Independent Advisory and Oversight Group, Council of Deans Health Research Advisory Group (**Croudace**); Public Health Scotland: Health & Homelessness (**Freeman**); British Association for Forensic Odontology (**Manica**); UK World Breastfeeding Trends Initiative, Healthy Start in Scotland & Fife NHS Health Inequalities Gypsy and Traveller Steering Group (**McFadden**); UK Society for Rehabilitation Research, Scottish NMAHP Group for Clinical Academic Careers, Cross-Party Committee on Stroke and Cardiovascular Disease, Health Improvement and Population Science Committee Scottish Government (**Morris**); European Cooperation in Science and Technology, European Cleft Palate Craniofacial Association, International Dental Federation VISION 2030, European Registry for Congenital Anomalies and Twins (**Mossey**); Sexual Health and Blood Borne Virus Prevention Health Protection Scotland, Drugs Research Network Scotland academic lead for health, social care and wellbeing (**Munro**); Milenio Scientific Initiative, Chilean Ministry of Science (**Sixsmith**); NHS Tayside Academic Health Science Partnership (**Breckenridge, Mossey, Sixsmith**); Scottish Oral Health Research Collaboration (**Clarkson, Freeman, Mossey**).

### Participation in the peer review process

All colleagues are engaged in the peer-review process as reviewers for journals, conferences, and funding bodies.



### Editorial positions

During this period our researchers were represented on editorial/advisory boards or held associate editorial positions with journals Biomed Central Trials, Birth, British Journal for Educational Psychology, Caries Research, Cleft Palate Craniofacial Journal, Community Dental Health, Criminology, Victimology and Security Review, Evidence Based Dentistry Journal, Fat Studies, Health Education Journal, Implementation Science (Biomed Central), International Journal of Nursing and Midwifery Research, Issues in Perinatal Care, Journal of Dental Research, Journal of Intelligence, Journal of Psychosomatic Research, Journal of Rehabilitation and Assistive Technologies Engineering, Longitudinal and Life Course Studies, Paediatric Dentistry , Psychotherapy Research, Quantitative Psychology and Measurement (Frontiers in Psychology), Social Psychiatry and Psychiatric Epidemiology, Community Dentistry and Oral Epidemiology.

**McFadden** is member of the Executive Group Lancet Series in Midwifery. **Boehnke** is since 2017 Co-Editor in Chief of "Quality of Life Research".