

Institution: University of Greenwich

Unit of Assessment: 3B - Allied Health Professions, Dentistry, Nursing and Pharmacy

1. Unit context and structure, research and impact strategy

Achievement of strategic aims since REF2014

Our ambition from REF2014 was to develop new areas of work in ageing and population health and to develop the next generation of researchers by providing an increasing number of developmental opportunities in the form of internships, funded PGR studentships, and post-doctoral scholarships. We also aimed to attract highly trained and motivated staff, increase the proportion of staff with PhDs, and grow and sustain a research culture whilst expanding our international networks. We have delivered and exceeded these ambitions by:

- Creating a new [Institute for Lifecourse Development \(ILD\)](#) that:
 - Has 250 members.
 - Supports seven key interdisciplinary areas of expertise.
 - Provides a new stimulating and supportive environment for ECRs and PGRs.
- Significantly improving our research productivity, quality, and impact (REF2014 UoA3B and UoA4 data are combined to enable comparisons with current submission):
 - Producing **859** outputs, more than double the previous period (319 in REF2014).
 - Q1 journal publications increased by 175% (585 versus 213).
 - A **four-fold** increase in field-weighted citation impact (6.39 versus 1.62).
 - Outputs **cited 36,054 times**, a three-fold increase (versus 10,193).
- Significantly increasing internal and external funding for research:
 - Increase in research income from **£1.09m** in REF2014 to **£5.2m** in the current period.
 - Investing over **£50m** in physical infrastructure and core equipment to support our ambitions, with brand new facilities for Health, Movement, Behavioural and Bioscience on our three campuses at Greenwich, Medway and Avery Hill (see section 3).
- Developing and expanding our research staff base (see section 2):
 - Doubling the size of our submission from **23.1 FTE** (UoA3 and UoA4) to **53.6 FTE**
 - Promoting **8** staff to Professor and **21** to Associate Professor.
- Increasing the research capacity and support of our workforce:
 - Providing start-up and support funds in excess of **£370k**.
 - Providing **£525k** in full or partial fees schemes and staff time to complete Doctorate or Masters degrees during this period (see section 2).
- Increasing research doctoral degrees support and completions
 - Funding **34** full time doctoral scholarships
 - Increasing overall doctoral completions from 11 in the previous period, to **45** in the current REF period.
- Increasing the depth and extent of impact
 - Increasing the reach of our national and international partnerships with health, social care, charitable and public sectors, local and national government organisations.

Unit context and structure

In 2019 we created and launched the **Institute for Lifecourse Development (ILD)** and appointed **Prof. Pacella**, as the first Director. The ILD comprises **seven research centres**, bringing together research and practitioner staff from across disciplines to foreground, consolidate and grow cross-professional and cross-disciplinary work and develop lifecourse focused research, evaluations and enterprise activities that directly resonate with our stakeholders, communities and partners; address societal challenges and have significant impact. The aim is to support equality, diversity and inclusion and develop our staff from across multiple disciplines, many of whom are practitioners, to ensure they achieve their full potential. The ILD's key objectives are to:

- Focus on vulnerable populations across the lifecourse
- Deliver theoretical and methodological innovation in research
- Create collaborative cross-disciplinary teams and a vibrant and inclusive research environment
- Communicate with users of research to create impact
- Create new professional solutions that improve people's lives
- Develop high-level academic training and continuing professional development
- Connect globally, building deeper relationships with partners, funders, and sponsors.

Around 250 staff, including Category A submitted staff, practitioner-focused staff (not identified as having a significant responsibility for research (SRR)) and research students are affiliated to the seven ILD Centres, drawn from disciplines across all four UoG Faculties. Staff can affiliate to more than one centre reflecting the interdisciplinary nature and overlap between themes. The ILD supports Category A submitted staff included in this **UoA3B (FTE53.6)** submission mostly from the *Faculties of Education, Health and Human Sciences (FEHHS)* and *Engineering and Science (FES)*, as well as UoA20 Social Work and Social Policy (FTE18), which includes staff from *FEHHS*, *Faculty of Liberal Arts and Sciences (FLAS)*, and *Faculty of Business (FB)*. Names of UoA3B submitted staff are in bold throughout to highlight the distinctive aspects of this Unit's environment.

This UoA3B submission showcases research and impact from a range of disciplines within the ILD: *Nursing and Midwifery; Paramedic Sciences; Speech and Language Therapy; Public Health; Sports Science; Psychology; Nutrition Sciences; Pharmacology; Health Economics; Biomedical and Biological Sciences*. ILD's work in *Sociology, Social Work and Education* is captured in UoA20.

The seven ILD centres map onto UN Sustainable Development Goals (UNSDG) agendas and the priorities of UKRI, NIHR, and other national and international NGO and government agendas in health and wellbeing. Specifically, ILD Centres align with the UNSDG goals of *Good Health and Well-being, Quality Education, Gender Equality, Reduced Inequalities, Decent Work and Economic Growth and supporting key Partnerships*; and, in addition, UKRI and NIHR agendas on *Healthy Ageing, Mental Health, Workforce Productivity, Developing the Current and Future Workforce, Disease Prevention and Health Inequalities, Innovation in Health and Social Care, and Integrating Services to Provide for Patients with Complex needs*. A number of smaller research structures have been launched within Centres to develop expertise around strategic themes that could develop into future ILD research centres.

ILD leadership

The ILD management team is made up of leaders of the centres (**Dibley, McCrone, Monks, Naclerio, Poulter, Stathi & Weldon**), who work with the Director (**Pacella**) to set the day-to-day agenda, manage resources, and develop intra- and inter-centre multi-disciplinary projects. The ILD [Advisory Board](#) ensures the management team is kept abreast of new developments and is supported internally and externally. The Advisory Board includes UoG FEHHS PVC (**Moore**), Director of the UoG Natural Resources Institute (NRI) (Prof Westby, see UoA6), and several distinguished external advisors: from the UK *Government Department of Health and Social Care* (Marron), *Chair of NHS Foundation Trust* (Taylor), and Education Academy Trust (Munday, CBE), and other third sector organisations (NAPC, Chana, MBE; Sporting Integrity, Verroken). **Pacella** represents the ILD as Faculty Director of Research and Enterprise on the University Research and Enterprise Committee. Senior members of the ILD also Chair and support Faculty and University Ethics (**Stathi, Maras**) panels and ensure staff and students at all levels are embedded in the appropriate ethical, legal and professional frameworks, obligations and standards. Our research benefits from being part of the Institutional open research environment that supports open access to outputs and data through the Institutional repository (GALA). We are committed to reproducibility agendas with early career researcher (ECR) staff actively involved with [ReproducibiliTea](#), an online journal club initiated in 2018 at the University of Oxford that has spread to 126 institutions in 25 different countries. Its main goal is to create opportunities for discussion about various themes linked to the Open Science movement,

including reproducibility, replication, meta-science, scientific misconduct and fraud. The ILD is committed to the responsible use of research metrics and supports DORA (San Francisco Declaration on Research Assessment) to which it became a signatory in 2020.

The ILD Centres

- **The Centre for Chronic Illness and Ageing** developed from our previous Centre for Positive Ageing (led by the late Prof Liz **West**), focuses on research and practice to inform self-care, health and social care practice and biological health solutions across the lifecycle. The Centre is led by **Dibley**, a leading member of the European Crohn's & Colitis Organisation, RCN's Gastrointestinal Nurses' Forum, The Inflammatory Bowel Disease (IBD) Nurses' Network, and London IBD Forum, and Honorary Visiting Fellow, King's College, London. The Centre hosts the **Nutrition and Diabetes Research and Practice Group**, led by **Ojo**, and works closely with the **Centre for Exercise, Activity and Rehabilitation**, and the **Biomedical Science Research Group** from the FES School of Science. The centre hosts **34** members: research staff with SRR, practitioners, ECRs, postgraduate research (PGR) students and staff undertaking part-time doctoral studies. Staff have undertaken externally funded work in the care and management of: *Auto-immune conditions, Arthritis, Cardiovascular risk, Crohn's Disease, Diabetes, Inflammatory Bowel Disease, Dementia, Vitamin D deficiency, Musculoskeletal disorders, Parasitic diseases, Toxicity, and Chronic Wounds*. Members have expertise in the *development of nutrition interventions, assessing cost-effectiveness of interventions and quality of life of older people and those with chronic conditions, pain and disease management, systemic drug delivery technologies and care home management*. The Centre's quality and wide ranging national and international collaborative networks are reflected in submitted outputs by: **Rodrigues Amorim Adegboye, Bowling, Cai, Dibley, Getti, Malamateniou, Moreno-Leguizamon, Newton, Nielsen, Ojo, Pacella, Patchay, Richardson, Schofield, Swaine, Thompson, West, and ECRs Essex and Stoner**. The Centre's extensive non-academic impact is reflected in our **impact case study** on the *assessment, management and perception of pain*.
- **The Centre for Professional Workforce Development** encompasses research and practice focusing on workforce development issues for healthcare and education professionals across the lifecycle. The Centre is led by **Weldon**, Executive Committee member for the Association of Simulated Practice in Healthcare (ASPiH); member of the Health Research Authority NHS Ethics Panel, Royal College of Nurses Research Forum, and Council of Dean's Research Advisory Group, alongside a national and international network of clinical and academic co-researchers, including honorary contracts with Imperial College London, and Barts Health NHS Trust. The Centre includes a **Cluster on Leadership in Education** (Jameson, UoA20), a **Hub for History, the Lifecourse, and the Professions** (Martin), and a **Simulation Group**. Centre staff have begun to further develop existing work on simulation, supported by significant investment in new state-of-the-art simulation centres in the Avery Hill and Medway Campuses. The Centre hosts **42** members: research staff with SRR, practitioners, ECRs, PGR students and staff undertaking part-time doctoral studies with staff having undertaken externally funded work in: *workforce retention, motivation, resilience, and well-being; work-based simulation; communication, teamwork, leadership, coaching & mentoring; professional identity, perspectives, recognition & responsibility; ethics; integrated care & interprofessional practices; historical practices & the living memory*. The Centre's quality and wide ranging national and international collaborative networks are reflected in submitted outputs by: **Cai, Cleaver, Essex, Gomes Alves, Schofield, West & Weldon**.
- **The Centre for Inequalities** key research areas are social justice, prejudice-reduction, and social integration. The Centre is led by **Stathi**, External Member of the European Association of Social Psychology, Society for the Psychological Study of Social Issues, British Psychological Society (BPS), and Committee Member, BPS Social Psychology Section. **Stathi's** wide national and international network of academic co-researchers evidences a long record of conducting theoretical and applied research projects,

publishing in high-impact factor journals, and pursuing research funding. The Centre hosts the **Social Psychology Hub** (led by **Stathi**) and works closely with the (Cross-Faculty) **Diversity Interest Group** and **Applied Social Work and Social Policy Research Centre** (see UoA 20). The Centre has **50** members: research staff with SRR, practitioners, ECRs, PGR students and staff undertaking part-time doctoral studies with staff having undertaken externally funded work in: *stigma and stigma reduction, impact of socioeconomic deprivation, gender and LGBT+ issues, racism and nationalism, inter-/intra-group dynamics, refugees, travellers and displaced communities, equality and social integration, community interventions, and social enterprise*. The Centre's quality and wide-ranging national and international collaborative networks are reflected in the submitted outputs of: **Birtel, Hartley, Luyt, Smith, Stathi & ECRs Amer, Collins, Gkinopoulos & Willis**. The centre plays an important role in supporting the University's Inclusivity Agenda in research, teaching and learning.

- **The Centre for Vulnerable Children and Families** focuses on research and practice aimed at benefitting the lives of vulnerable children and their families across a broad range of contexts internationally. The Centre is led by **Monks** who has extensive external links with UK-based and international organisations. She works with colleagues at Universities in Europe (University of Cordoba, Spain), Asia (Chung-Ang University, South Korea) and South America (University of Concepcion, Chile) on research into social relationships, including bullying, aggression and online interactions. She also has collaborative links with national NGOs and local council services working with children, young people and families. The Centre hosts the **Cluster for Play and Recreation** (Martin), **Youth and Wellbeing Hub** (Moon) and the **Lifecourse Methodology Hub** (McCrone, Thompson, Dibley). The Centre has **30** members: research staff with SRR, practitioners, ECRs, PGR students and staff undertaking part-time doctoral studies with staff having undertaken externally funded (see section 3) impactful work in: *pre and perinatal care & education, early intervention in nurseries & schools, developmental disorders, speech & language problems, parenting styles, adverse childhood experiences, child maltreatment and bullying, risks for involvement in antisocial & criminal behaviour, addiction, safeguarding & ethics, and narratives of childhood*. Appointing Professor Ortega-Ruiz as Visiting Professor from the University of Cordoba, Spain, has strengthened the international focus of research on young people's experiences of bullying and cyberbullying while Visiting Professor Carl Parsons from Canterbury Christchurch University has strengthened the focus and reach of social inclusion research. The quality and wide-ranging national and international collaborative networks of the centre are reflected in the submitted outputs of **Hobson, Humayun, La Placa, Malamateniou, Monks, Moore, Morgan, Pacella, Tadic, & Tsermentseli and ECRs Ahmad, Bernardi, Moon & Samara**. The extensive non-academic impact of the Centre is reflected in our **impact case study** on *safeguarding, inequalities, school transition, and bullying policies and practice*.
- **The Centre for Thinking and Learning** conducts research concerned with applied aspects of cognition and learning, and evidence informed education practice from early childhood to adult learning. The Centre is led by **Poulter**, Expert Advisor to the Department for Transport on a nationwide trial of road safety interventions for young and novice drivers, and Member of the Parliamentary Advisory Council for Transport Safety. The Centre has extensive expertise in neuroscience and neuroimaging methods, hosting the **Neuroscience Hub** (Patchay), **Face and Voice Recognition Research Lab** (Davis) and **ReproducibiliTEA Journal Club** (Samara), as well as an inter-Faculty partnership with the **Centre for Research & Enterprise in Language** (Arche, UoA26). The Centre has **49** members: research staff with SRR, practitioners, ECRs, PGR students and staff undertaking part-time doctoral studies with staff having undertaken externally funded work in: *movement science, memory, cognitive bias, decision-making processes, hazards and risk perception, literacy and numeracy development, language impairment, neurological disorders, and accelerated learning*. The Centre's quality and wide-ranging national and international collaborative networks are reflected in submitted

outputs by: **Davis, Farmer, Gladwin, Janacsek, Luke, Patchay, Poulter, Thompson & Uher and ECRs Bernardi, Collins, Pereira Dias, Samara & Ye**. The extensive non-academic impact of the centre is reflected in our **impact case study** on *Impact of Super-Recognisers on the establishment and staffing of specialist police units*.

- **The Centre for Mental Health** focuses on developing research and practice to support mental health and wellbeing across the lifecourse. The Centre is led by **McCrone**, also Visiting Professor of Health Economics, King's College London, Member of the NIHR-funded Mental Health Policy Research Unit and Health Economists Study Group, and Editorial Board Member, Journal of Public Mental Health and International Journal of Environmental Research and Public Health. The Centre also hosts the *Managing wellbeing during Covid-19 project* (**Smith**) and supports the University Mental Health agenda and events. The Centre has a growing number of members (**20**): research staff with SRR, practitioners, ECRs, PGR students and staff undertaking part-time doctoral studies, with staff having undertaken externally funded (see section 3) impactful work in: *child and infant mental health and transitions, use of alcohol and drugs, health behaviour, health education, lifestyle choices, stress and anxiety management, and mental health interventions*. The Centre's quality and wide international collaborative networks are represented in submitted outputs by: **Cleaver, Foster, Humayun, McCrone, Robinson, Tharp, & Thompson and ECR Pereira Dias**.
- **The Centre for Exercise, Activity and Rehabilitation** focuses on research and practice aimed at improving health benefits and outcomes across the lifecourse through exercise, activity and restoring function following injury or ill-health. This most-recently created Centre is led by **Naclerio**, External Member of the American College of Sport Medicine, National Strength and Conditioning Association, International Society of Sport Nutrition, Association for Nutrition (UK) alongside a national and international network of Sport Science, Nutrition, fitness industry, and academic co-researchers. **Naclerio** is also an Honorary Visiting Fellow of The European University of Madrid, Lunex International University Health, Exercise & Sport and the National University of La Plata (Argentina). The Centre also works closely with the **Nutrition and Diabetes Research and Practice Group** and **Biomedical Science Research Group**. The Centre has a growing number of members (**21**): research staff with SRR, practitioners, ECRs, PGR students and staff undertaking part-time doctoral studies. Staff have undertaken externally funded work around: *clinical and commercial applications of nutrition, ergonomics and exercise for sports, health, and recovery*. The Centre's quality and wide international collaborative networks are represented in submitted outputs by: **Goss-Sampson; Naclerio, Seijo Bujia, Swaine and ECR Rossato**. The extensive non-academic impact of the Centre is reflected in two **impact case studies** on: *Human factors related to physical protection equipment for UK police forces; and on Nutrition products, and injury reduction and recovery protocols for high performance athletes*.

Facilitation of impact

Since its launch, the ILD has been committed to further enhance and bring together research and practice, providing the infrastructure and focus required to support the creation and curation of world leading impact. ILD already incorporates numerous research and practitioner staff who have created major impact (see Case studies), have extensive relationships with external stakeholders and are involved with many organisations as expert advisors and collaborators (see Section 4). Additional information on external funding to support case studies is presented in Section 3. Greenwich Research and Enterprise (**GRE**) has a dedicated Impact Framework Manager who works closely with the ILD impact Assessment Officer (**Gladwin**), also an active researcher. Each ILD Centre has research-leads and practice-leads working to ensure we develop and foster impact pathways and supporting and encouraging staff to develop the required long-term knowledge exchange partnerships.

How the selected case studies relate to our approach

Our case studies highlight a range of impacts arising from our many strong relationships (both current and historical) with national and international partners in health, local government, professional bodies, commercial companies and police-forces, and showcase the multidisciplinary impact that has come from our expertise in the:

- Assessment, management and perception of pain (**Patchay, Schofield, Thompson**).
- Identification and training of “Super-Recognisers” (**Davis, Thompson**).
- Risk factors for childhood development related to safeguarding, inequalities, school transition, and bullying (**Maras, Parsons, Gilchrist, Monks, Thompson**).
- Human factors evaluation of police protective equipment (**Goss-Sampson, Naclerio, Chapman**).
- Development and commercialisation of health and sports nutrition products (**Naclerio, Seijo Bujia, Goss-Sampson, Nielsen, Christides, Karsten**)

These case studies provide evidence of the submitted unit’s impact achievements during the assessment period, showing we have been instrumental in changing policy and guidelines and informing commissioned reports for the UK Department for Education (Bennet and Timpson), Northamptonshire, Hampshire, & Waltham Forest Councils, NICE, and international health organisations including UNICEF, the Australian NGO CREATE, the Irish National Council for Special Education, the New Zealand Government Health and Quality Commission, the US National Council on Ageing, the UK Royal College of Anaesthetists, the UK British Pain Society, the UK British Geriatrics Society and the UK Chartered Society of Physiotherapy. Our work has also impacted on national and international police forces and related organisations: Metropolitan Police Service, Munich Police (Germany), Stuttgart Police (Germany), and Queensland Police Services (Australia), the Association of Chief Police Officers (ACPO), the Home Office, and the Police Federation. Finally, we have improved commercial outcomes for national and international companies who provide super-recogniser services or produce and sell health and sports products: Crown Sports Nutrition, Inertial Power SRL, ARC Microtech, Super Recognisers International Ltd (UK), Yoti Ltd (UK and India), and VisionMetric Ltd (UK).

Future strategy

We plan to continue to support these strong areas of impact, and ensure we develop, support and grow our impact pathways to reach their full potential for the next REF. We will support our close collaborations with local government to address the issue of home drinking of alcohol (**Foster**); grow the impact of international participatory research on inequalities in health care (**Moreno-Leguizamon**); develop the impact of our research on recovery after surgery (**Swaine**) and on enteral nutrition in diabetes (**Ojo**); develop simulated practice in the workforce (**Weldon**) and continue to support our growing impact on commercial organisations from research in our bioscience labs. This has begun to result in patents, and recently led to the creation of Intracellular Delivery Solutions (IDS) Ltd., a spin-out company registered with Companies House, with **Richardson** a Director and Chief Scientific Officer at IDS Ltd.

We will also continue to deliver the key aims of the ILD (as outlined above) and build on our existing extensive and strong partnerships with local, national, and international health, community, third sector and government organisations and companies to continue to undertake world-leading research of rigour and significance. The development of our themed centres has been a key part of our future strategy, with the intention over the next period to:

- Continue to promote research excellence and enhance our research culture.
- Maximise the societal impact of all our current pathways and extend further our international reputation in research and impact.
- Develop practice-leads in each Centre, to work alongside the current research-leads, and further strengthen the working relationships, practice and research collaborations between the ILD and local, regional, national and international partners.
- Further develop interdisciplinary research within and between Centres and develop collaborations with the Queen’s Anniversary Prize-winning NRI and other global partners in the UNSDG agenda.
- Fully utilise the significant investment in new simulation facilities at Avery Hill, Medway and Greenwich and launch new world-leading Centres: an ILD **Centre for Simulated**

Practice and a **Centre for Lifecourse Economics** that builds on recent appointments (**Pacella, McCrone**).

- Continue to recruit high quality research active staff and ensure their interests align with our thematic interdisciplinary priorities.
- Increase research income from UKRI/NIHR and other esteemed funding streams, such as MRC, NIHR, Wellcome, ERC.
- Continue to develop practitioner staff through continued support of staff PhD, EdD and MSc study, fee waivers and embedding themed work within the ILD's supportive structures.
- Grow Doctoral College funding with the FES School of Science and increase further PGR student provision.
- Mentor and support the PGR and ECR research community to succeed as independent researchers.
- Further encourage pre-registration and replication of studies and continue to ensure issues around ethics, openness, integrity, equality and inclusion, and responsible use of metrics are embedded in all our activities.

2. People

Staffing strategy and staff development

Key academic appointments

In 2018 we appointed a new PVC (Prof **Moore**) in FEHHS who worked with Profs **Maras, Monks, Cleaver, & Luyt** to create the ILD. Prof **Pacella**, appointed as ILD Director in 2019, has an outstanding track record of high-quality publications and impactful research. Her career has focused on improving health and she is internationally recognised for burden of disease assessments and economic evaluations of healthcare interventions. **Pacella** is experienced in managing large-scale projects, contributes to several international collaborations and holds an Adjunct appointment at Queensland University of Technology (QUT). Prof **McCrone** was also appointed in 2019 for his specialist expertise in health economics. **Moore** has extensive experience of working on large interdisciplinary projects looking at children at risk (funded by Wellcome, NIHR, Nuffield foundation etc.) which helped inform the concept and creation of ILD. Two senior researchers who featured in REF2014, **Schofield** and **West** (sadly deceased), are no longer with us at Greenwich but played an important role in supporting early research activity in FEHHS. Subsequently we have refreshed our senior research leadership team. In 2017 we appointed **Dibley** and **Weldon** as Associate Professors in Nursing through a joint initiative with Barts Health NHS Trust. These roles strengthened the academic and health partnership between Barts and UoG by enabling direct access for UoG to a local NHS Trust, at the time the largest in the country, whilst providing Barts with academic expertise and leadership for nursing, midwifery and allied healthcare professional staff to help them develop their clinical academic agenda.

A key element of our strategy has been to ensure we recruit high quality research active staff who are committed to the ILD's aims, identify with ILD Centre themes and are interested in developing interdisciplinary impact. Ten senior staff members have remained from previous submissions in REF 2014 UoA3 and UoA4 (**Davis, Foster, Humayun, Maras, Monks, Poulter, Robinson, Stathi, Tharp, Thompson**); they have been joined by new staff we were able to recruit during an expansion in staffing across FEHHS. This provided an opportunity to recruit excellent established and ECR staff from leading institutions: including **Weldon** (Imperial College, London); **Ahmad, Dibley, Hobson, McCrone, Pereira Dias**, (King's College, London); **Birtel, Cook, Gkinopoulos, Moore**, (University of Surrey); **Bernardi, Tadic**, (University College London); **Uher**, (London School of Economics); **Ye**, (Queen Mary University of London); **Samara**, (University of Liverpool), and **Janacsek** (Eotvos Lorand University, Budapest). Strategic investment of QR/HEIF funds has supported the growth of the ILD through appointment of eight FTE Research Fellows (including ECRs Kalocsanyiova (UoA20), **Essex, Gkinopoulos, Hartley & Moon**) and ILD Knowledge Exchange fellow (Kucaba).

Key support staff appointments

To support the ILD in delivering impact we have also recruited an Impact Assessment Officer (**Gladwin**), an ILD Senior Research Support Officer (Trudeau), and a Communications, Events and Engagement Officer (Russell-Clark). In this cycle, FEHHS has also appointed a new technical learning resource manager and an educational simulation lead, to support our new simulation-based research facilities (Jagodzinski, Everard). A skills support officer has also been employed and two further full-time posts (technician and simulation fellow) are currently being recruited. We have also invested in specialist technical support posts for Movement Science, Psychology and Biosciences laboratories (Belanova, Cooper).

Academic pathways and allocation of scholarly research time

The university has three career pathways that staff can select: Research, Knowledge Exchange and Enterprise, and Teaching and Learning. The ILD Centres support activity of staff on all three pathways ensuring clear links between research, teaching and learning, practice and impact. The University's workload model allocates 11% time for all academic staff to engage in research and scholarly activity, regardless of the pathway staff select. As per the UoG [Code of Practice](#) this allocation is greater than 20% for staff on research pathways identified as having significant responsibility for research (SRR). To build capacity, 178 non-SRR academic staff across Faculties are formally affiliated to the ILD Centres, with many employing their allocated 11% research and scholarly activity time to develop extensive networks and contribute to our excellent impact. SRR staff with key roles in research and funded research projects are also given additional time, for example ILD Centre leads: **Dibley, McCrone, Monks, Naclerio, Poulter, Stathi, Weldon** all have 2 days allocated per week to undertake the role. **Monks** and **Weldon** are also Deputy Heads (Research & Enterprise) in their respective academic Schools within FEHHS. The ILD works with FEHHS Heads and Deputy Heads of School to facilitate (one term) **sabbatical awards**, with many ILD members benefiting in the current REF cycle, including **Davis, Foster, Monks, Moreno-Leguizamon, Poulter, Robinson, Stathi, and Thompson**. Staff members on the teaching and learning pathway were also granted sabbaticals to write up final PhD theses (Gale, Matonhodze).

Staff promotions

In this period, across all pathways, eight colleagues were promoted to Professor (**Monks, Cleaver, Davis, Ade-Ojo** (2020), Evans, Field, **Luyt** and Walker) in FEHHS and twenty-one were promoted to Associate Professor, Reader or Principal Lecturer: **Birtel, Patterson, Janacsek, Luke, Moreno-Leguizamon, Newton, Ojo**, Pentaris, **Thompson, Uher, Ade-Ojo** (2019), Jeavons, McDonald, **Morgan, Patchay**, Patterson, **Robinson, Stathi** and Stevenson in FEHHS and **Getti**, and **Richardson** to Associate Professor in FES.

Mentoring, probation and appraisal

Research is embedded from the outset into mechanisms of support provided to staff throughout their employment at the University. Induction involves a scheduled meeting with the Deputy Heads of School for Research and Enterprise (**Weldon & Monks**) to discuss support mechanisms, lab and equipment needs, including the support available within the ILD. New staff members are encouraged to affiliate with a relevant Centre(s) and attend Centre Meetings and ILD Events. All new staff are allocated a mentor within the School and ILD to share knowledge and skills, assist in networking and support career development. Probation research objectives are set and agreed with the individual and support mechanisms are tailored to the individual's needs and experience. Similarly, the appraisal system supports staff in their research objectives, activities and development. All staff are expected to identify appraisal objectives related to research; this may include a focus on pedagogic research or consultancy for those on teaching and learning or enterprise pathways. Areas of development and support mechanisms are also identified within this discussion and may include further mentoring, internal or external training or PhD registration for non-SRR staff. These staff development needs are also discussed and reviewed in mid-year staff development meetings outside the appraisal process.

Allocation of QR HEIF and RCIF funds to support growth and development

An ILD Competitive Funding Panel, chaired by the Director and including the ILD leadership team, assesses applications ensuring strategic investment of QR funding in priority impactful

research. Since 2017, this panel and its pre-ILD Faculty predecessor has awarded £85,800 in **seed funding for specific pilot projects and impact activities**, to 36 SRR staff (22 Female; 14 Male). In addition, £11k was awarded to submitted staff to fund strategic **research visits** with international collaborators, resulting in several high impact publications; £12,219 has also been awarded to experienced researchers to present at **conferences**. QR funds were also allocated to PGR students (£13,550) and ECRs (£18k) for conference attendance, external training and research support. In this assessment period, we also employed a number of **short-term student research assistants** through HEIF funding (£6k per annum), and these undergraduate and postgraduate students have gained paid research experience supporting staff on research projects. RCIF investment (£232k) over the period has also mapped to strategic areas of growth and impact. Total funds to support growth and development has been in excess of £370k.

Support for ECR staff

The ILD provides a supportive and stimulating environment for twenty-nine ECRs (Category A submitted and other staff) currently employed in FEHHS (**Ahmad**, Ahmed, **Amer**, **Bernardi**, **Bowling**, **Collins**, Coombes, Cotton, **Pereira Dias**, **Essex**, Gibson, **Gkinopoulos**, **Gomes Alves**, Kalocsanyiova, Kerr, Kralova, Kucaba, Magaji, Markowski, Miller, **Moon**, Neal, Perrin, **Rossato**, **Samara**, **Stoner**, **Willis**, Wolfendale, **Ye**). ECRs facilitate their own network events and dedicated staff represent ECRs across a range of Faculty and University committees, including the promotions panel (**Bernardi**, **Gkinopoulos**) with Prof **Davis** the ECR co-ordinator. Regular ECR activities are held within the ILD and across the University. ECRs in Science have a dedicated champion at professorial level who represents their views to management in collaboration with the ECR representative on the management team. We also have formal and informal mentoring systems, including new staff mentoring schemes in the School of Human Sciences and the School of Science, and the ECR Network.

Central research support investment

GRE supports research in the University (see REF5a). Staffing investment in GRE included the appointment of a Head of Research Services (Cormack-Bissett), as well as Enterprise Development Managers (EDMs) and Research Development Officers (RDOs), to support each Faculty. The EDM (Rannard-Lambert) and RDO (Saines, succeeded by Rebaine) work directly with ILD research staff to develop enterprise and research bids, providing expert advice and costings. In addition, the University invested in a new Research and Enterprise Training Institute (RETI), specifically to support research training for all PGR students and staff in line with the Researcher Development Concordat.

Research Students

Research culture

Doctoral students are members of ILD Centres and are actively encouraged to present at ILD events and attend specialist training sessions. ILD has a lively research culture that engages staff across all levels from PGR student to Chair fostered through a range of activities, including monthly **ILD Research Cafés**, which encourage all research active staff and PGR students to present their work and receive constructive feedback. Amongst the themes so far discussed are: *managers in education settings, diet and Type 2 diabetes, using secondary datasets, black women in school leadership, physical activity, developing student resilience, early childhood development, rape myths, parenting following an IVF pregnancy, gender and ethnicity judgements of lockdown violations, public signage during COVID-19, using network meta-analysis, heterosexist micro-aggressions, dietary supplements for older adults, and palliative and end of life care*. The ILD launched its **Public Lecture Series** in January 2020 and has hosted highly regarded external speakers in this assessment period, initially on campus and most recently online including:

- Prof. Paul Greenhaff, University of Nottingham, on *Healthspan: age vs lifestyle*
- Dr Stefano Pagliaro, University of Chieti-Pescara, Italy, on *Intimate Partner Violence*
- Tom McBride, Early Intervention Foundation, on *Improving Outcomes for Children*
- Prof. Margaret Rayman, University of Surrey on *Selenium and Human Health with Reference to COVID-19*.

These lectures are very well attended by students, staff and external guests. An annual **University Research Conference** features all levels of staff and PGR students, and ILD-hosted **annual EDI Research** and **PGR Student Research Conferences** allow students an opportunity to showcase their research. There is also an annual student development conference, within which new students receive **induction training** and continuing students are invited to sessions on publication, career opportunities and the doctoral journey. We hold two 'EdD Weekends' each year for education doctoral students to present their research and engage with external and expert speakers. The ILD actively supports the National **Three Minute Thesis** competition (3MT) and has a firm commitment to developing future generations of researchers and practitioners: staff have published 150+ articles with a PGR student co-author, including publications in Q1 journals across numerous SJR categories; ILD staff also published 100+ articles with undergraduate and Masters students.

Funding of PGR studentships and fee waivers

There has been a substantial increase in doctoral student funding, numbers and completions compared to REF2014 with 45 doctoral degrees awarded in this assessment period. To support our ambition to grow research capacity and increase diversity in research among practitioner staff in allied health professions, many new staff appointed on teaching and learning pathways were supported through a fees scheme and additional scholarly activity points to support academic and research career progression via EdDs, PhDs and Masters' Programmes. In this period, for staff development, we waived **£390k** in fees for internal supervision and covered **£135k** in fees at external institutions.

In addition, we have awarded **34** fully funded Vice Chancellor's Scholarships since 2014. Potential supervisors apply for VC scholarships from across the University and these are awarded following a rigorous competitive assessment process. External advertising then attracts PGR students to these outline projects and representative interview panels ensure fair and transparent recruitment process. Successful students then develop and refine proposals, in conjunction with their supervisors. VC Scholarships have been allocated to a range of supervisors, including ECRs, across all seven Centres: **Cleaver** (1), **Davis** (3), **Foster** (1), **Getti** (2), **Jaworowska** (1), **Luyt** (1), **Maras** (3), **Monks** (2), **Moreno-Leguizamon** (1), **McCrone** and **Pacella** (1), **Newton** (2), **Nielsen** (1), **Patchay** (1), **Richardson** (2), **Robinson** (1), **Rossato** (1), **Shorter** (1), **Smith D** (1), **Smith R** (1), **Stathi** (1), **Swaine** (1), **Thompson** (2), **Tsermentseli** (1), **Uher** (1), **Weldon** (1). Doctoral students have also received scholarships from external partner organisations, e.g., *Charlton Athletic Community Trust, School of Hard Knocks, Responsibility in Gambling Trust, Oxleas NHS Foundation Trust, Barking, Havering and Redbridge University Hospitals NHS Trust, Lewisham Healthcare NHS Trust, and Imperial NHS*. Biosciences staff have also received Cluster Funded PhDs (**Getti**) as well as Doctoral Training Alliance PhD allocations (**Richardson, Getti**).

Mentoring, support and skills development

We have four doctoral programmes (three PhDs and an EdD) each with a Programme leader. EdD and PhD students in Education are supported by Ade-Ojo (UoA20), whilst PhD students in Human Sciences and in Health Sciences are supported by **Birtel** and **Newton**, respectively, with **Smith** the PGR student co-ordinator. Each programme provides relevant PGR training/support. Supervision teams normally consist of three staff with a minimum of three doctoral completions between them. Mandatory RETI training and regular refresher courses are provided for all staff involved in supervision (See REF5a). ILD also provides funding for the UK Council for Graduate Education Research Supervision Recognition Programme, with Professor Ade-Ojo ILD's first Recognised Research Supervisor. In addition, key Visiting Professor appointments have strengthened supervisory teams including Prof Corney (Emeritus Professor of Psychology) and Prof Leveille (University of Massachusetts) who worked closely with the late Prof **West** on pain and ageing and currently supervises a student analysing the MOBILIZE Boston Study data.

PGRs receive tailored support from RETI, which provides training guided by the **Vitae Researcher Development Framework**, on topics such as research ethics, and preparation for the transfer and final viva. RETI provides a structured programme ensuring all PGR students

receive mandatory training in a wide range of topics to support their studies including research skills, teaching skills, examination preparation, subject specific skills and extramural skills. This Development programme is supported by dedicated academic staff who support and mentor PGR students. New students are allocated a peer mentor in our PGR 'buddy' scheme. PGR student representatives provide a student voice at School, Faculty and University level. All doctoral students undergo a process of annual reviews and have access to ILD funding (as outlined above). All PGR students are provided with their own dedicated workspace, standard and specialist office IT equipment, and have priority access to laboratory resources and this excellent support is reflected in scores >80% in research skills, responsibilities, professional development, progression and supervision in PRES.

Equality, diversity and inclusion

Analysis of EDI data confirmed that our submission reflects our diverse workforce and is representative across all protected characteristics with 41% of Category A submitted staff being from a BAME background; 50% female; and 6% with a declared disability (almost double that for UoG overall). A high proportion of SRR staff are on permanent contracts (89%) with 9% working part-time. In this period, we have been very successful and active in supporting the advancement of female staff with many ECR staff involved in the Aurora leadership development programme. We are also pleased that in this period a number of women identified with SRR were appointed or won promotion to Professor (**Cleaver, Monks, Pacella**), and Associate Professor (**Adegboye, Birtel, Dibley, Getti, Janacsek, Stathi, Uher and Weldon**). We continue to support all staff to succeed, promoting active University and Faculty EDI strategies that aim to address intersectional issues in our workforce, informed by national frameworks and reviews (UKRI, AdvanceHE reports, Athena Swan etc.). The ILD has worked with the Chair of the UoG BAME staff network (**Patchay**) and EDI advisors to develop and implement an ILD EDI Action Plan. Our submission is well represented by staff with caring responsibilities, and we have a good gender balance of ECRs. We support all staff with sabbaticals, writing retreats, conference funds and have flexible working arrangements and remote working, and support staff returning from periods of leave (including parental leave) with reduced duties. Personal circumstances are considered by promotions panels in assessing research achievement and outputs relative to opportunity. The selection of outputs for REF2021 relied on internal and external expert review as the primary means of assessment, using citation data as additional information as per the UoG Code of Practice and 57% and 23% of selected outputs were attributed to female and ECR staff, respectively.

Future staffing plans

As existing staff leave or retire or as new posts are created with expansion of student numbers, FEHHS will continue to make strategic appointments that ensure the research expertise of new staff complements, and can be supported by, the new ILD Centres. All adverts highlight the ILD, and interview panels look to explore the ambitions of candidates to work within Centres. New staff will be recruited in the School of Health Sciences to contribute to the expansion of expertise in mental health, chronic illness, and workforce development, and support investments in simulation as part of a longer-term plan to develop an eighth ILD Centre in Simulated Practice. Ongoing staff development is also key to ILD's sustained development and expansion: the continued support of practice staff in attaining doctorates and developing relationships with practice partners. We also intend to make more secondments, honorary and visiting clinical appointments to support the Centres in developing and embedding expertise with healthcare partners. Staff in Health and Human Sciences have strengths in methods and research design and will be brought closer to practitioners to develop pathways to impact. We are committed as an institution and as individuals to quality and inclusivity and to actively supporting the advancement of staff with protected characteristics. We will continue to actively recruit staff from diverse backgrounds and support their career development.

3. Income, infrastructure and facilities

Income

Research and Enterprise income totalled **£8.9m** in this assessment period, with research income captured by HESA data increasing from **£1.09m** in REF2014 to **£5.2m**, from research councils,

charities, industry and EU/UK government bodies. The ILD Centres map onto international funding priority areas and are well networked with stakeholders. Senior appointed staff have been Principal and Co-Investigators on several large-scale funded projects hosted elsewhere during the cycle that have supported their work (**Dibley, McCrone, Weldon**) bringing **£280,000** in transferred research funds with them. **Pacella** was PI on the AUD2.3 (£1.3) million Australian Child Maltreatment Project 2019-23, funded by the Australian National Health and Medical Research Council before moving to the UK and remains chief investigator (not transferred). With the increase in experience and support, bidding activity has significantly increased. A key part of support comes from the ILD **internal peer-review panel** (including Director and Centre leads) which has enhanced the quality of submitted external grant applications, supporting the development and ambition of staff at all levels, from ECR upwards. **Writing retreats** were also funded from QR to provide dedicated time for finalising outputs and grant applications.

Funding has been secured from numerous competitive funding sources for both primary research and for building national and international networks and collaborations, for example:

- **UKRI:** Biotechnology and Biological Sciences Research Council (BBSRC) (**Nielsen**); High Value Chemicals from Plants Hub (**Nielsen**); Medical Research Council (**Poulter, McCrone**); Economic and Social Research Council/National Centre for Research Methods (**Poulter, Moreno-Leguizamon, Weldon**); Innovate UK (**Davis**); Arts and Humanities Research Council (**Weldon**); Science and Technology Funding Council (STFC) (**Richardson**).
- **EU funds:** EU FP7 (**Davis**); EU Interreg (**Goss-Sampson**); European Regional Development Fund (**Foster**); Horizon 2020 (**McCrone**)
- **Research Charities:** Bowel and Cancer Research (**Dibley, Newton**); British Academy (**Hartley**); Burdett Trust for Nursing (**Cleaver**); Danish Dairy Research Foundation (**Adegboye**); International Society of Sports Nutrition (**Naclerio**); Leverhulme Trust (Fivaz); Nursing and Midwifery Council (**West**); Paula Carr Diabetes Trust (**Newton, Ojo**); PECAN (**Maras**); School of Hard Knocks (**Rossato**); Wellcome Trust (**McCrone**)

We have also received direct and commissioned research funding from many other bodies:

- **Education bodies:** Macmillan Science and Education (**Robinson**); South East London Maths Hub (Field)
- **Local health bodies:** Barts Health NHS Trust (**Weldon, Dibley**); Brighton and Hove NHS (**Schofield**); Greenwich and Bexley Community Hospice (**Newton**); HEE Kent, Surrey & Sussex (**Moreno-Leguizamon, Newton, West**); HEE North Central and East London (Al-Haboubi); HEE South London (**Cleaver, Foster, Keogh**); Kent Surrey and Sussex Academic Health Sciences Network (**Schofield**); Medway Community Healthcare (Docking); Medway NHS Trust (**Schofield**); NHS Greenwich Clinical Commissioning Group (Burke)
- **National Health bodies:** Health Education England [HEE] (**Cleaver, Moreno-Leguizamon**); NIHR (**McCrone, Swaine**), NHS England (Burke)
- **National and Local Government organisations:** Department of Transport (**Poulter**); Kent County Council (**Maras**); South London Innovation Fund (**Schofield**)
- **Pharma companies:** BIAL (**Luke, Michael**)
- **Police forces:** Singapore Police (**Davis**)
- **Specialist businesses:** YOTI (**Davis**)

As well as the impact outlined in our case studies, this research has supported a wide range of newly developing areas of impact activities including **McCrone's (Wellcome Trust)** work on interventions for people with schizophrenia and their caregivers in India, cited in the WHO mhGAP operations manual, and the NICE guidelines for Psychosis and Schizophrenia in Adults: Prevention and Management: Appendix A. Cost-effectiveness in chronic wound management research led by **Pacella**, funded through a £900k QUT-Australian Wound Management Innovation CRC partnership, has been instrumental in establishing the Chronic Wounds Solutions Collaborating Group and developing a draft of a whole new financing system through **Australian Medicare** to support chronic wound management in primary care and improve

outcomes for patients.

Our research and practitioner staff are highly active in and generate income from consultancy and enterprise activities. For example:

- **Charitable Trusts and other non-profit-making organisations:** British Academy (**Birtel**); Bexley Training Hub (**Foster**); Bexley Safeguarding Children Board (Webb); National Autistic Society (Cook); Asociación Profesional de Entrenamiento Personal (**Naclerio**); Association for Information Technology Trust (Alsbury); Biochemical Society (Rickard); British Mass Spectrometry Society (**Nielsen**); Charlton Athletic Football Club (Chapman); Consultative Group on International Agricultural Research (Christides); Emergency Exit Arts (**Foster**); Family Action (**Maras**); NSPCC (**Monks**); Nutritia Research Foundation (Christides); Research in Practice (Webb); Royal Commission for the Exhibition of 1851 (Alsbury); Royal Society of Biology (Rickard); Tennis Foundation (Steptoe); United Response (Woodward); Youth Endowment Fund (**Humayun**)
- **Education bodies:** European University of Madrid (**Naclerio**); Higher Education Entrepreneurship Group (Oham); Ministry of Education and Training Vietnam International Education (George); Oxford University (Oham); The Association of Commonwealth Universities (Stock); University College London (**Tadic**); University of East London (**Getti**); Zaporizhzhya National University (Karsten)
- **Local Health bodies:** Dartford & Gravesham NHS Trust (Chojnacka); Greenwich & Bexley Community Hospice (**Newton**); Lewisham & Greenwich NHS Trust (Chojnacka); Oxleas Foundation NHS Trust (**Cleaver**); South London and Maudsley NHS Trust (Ibe)
- **National Health bodies:** Health Education England [HEE] (Bower, Burke, **Cleaver**, Crapnell, **Swaine**); HEE North Central and East London (**Cleaver**); HEE Kent Surrey Sussex (Burke, **Foster**, **Maras**); HEE South England (**Maras**); HEE South London (**Cleaver**, **Maras**); NIHR (**Dibley**, **McCrone**, **Swaine**); NHS England (Stokes)
- **Pharma companies:** AstraZeneca (Pullen)
- **Police forces, legislation bodies and inquiries:** Essex Police (**Davis**); Greater Manchester Police (**Davis**); Hertfordshire Police (**Davis**); Metropolitan Police (**Goss-Sampson**); Frankfurt Police (**Davis**); Hillsborough Inquest (**Davis**); Ministry of the Interior and Kingdom Relations [Netherlands] (**Davis**); Munich Police (**Davis**); Queensland Police (**Davis**); Seequestor (**Davis**); Stuttgart Police (**Davis**)
- **Specialist businesses:** Arc4Health (**Naclerio**, Karsten); Super Recognisers International (**Davis**); Go-Fit (**Naclerio**); Elements (**Naclerio**); Institut Laue-Langevin (Dyer); MeatProt (**Naclerio**); Ninsun Proteinias (**Naclerio**); Oncolytika (**Richardson**); Rockfield Medical Devices (**Ojo**); Super Recognisers International (**Davis**); TJX Europe (**Davis**); YOTI (**Davis**).

New infrastructure and facilities

Since 2014 the University has invested significantly in estates and infrastructure funding, and the necessary technical staff (see section 2). In 2017, **£32.5m** was spent on the Dreadnought Building Redevelopment at Greenwich, with **£2.7m** on equipping the **Psychology Laboratories**. In 2020, **£15.2m** was spent on the Avery Hill campus reconfiguration, including our **new Simulation Laboratories**, with **£2.64m** spent on capital equipment. In 2020 we also invested **£282k** in our **Movement Science Laboratories**. A further **£260k** is also being invested at Medway to support SaLT research facilities and extend our simulation provision further; there has also been significant capital investment in **Biosciences Laboratory** equipment.

New Simulation Laboratories (Avery Hill and Medway Campuses)

The new simulation labs were designed in close international partnership with CAE healthcare to support the ILD's **Centre for Professional Workforce Development (Simulation Group)** led by **Weldon**. The new facilities of the Skills and Simulation Labs include new equipment not yet released to a wider audience, for example UoG was the first UK University to receive Augmented Reality CAE Ares manikins. This partnership facilitates numerous international research, knowledge exchange and impact opportunities. There are also plans for the facilities to

be used to engage the local community and partners in simulated health-related events. The labs consist of:

- Static and mobile video and audio capture for debriefing across all the facilities
- Three large, five-bedded, inpatient wards looking after adult general; midwifery ante and post-natal; and paediatrics including neonatal high and intensive care patients.
- Three clinical skills simulation suites.
- Three triage or patient consultation rooms.
- A fully functioning one bedroom flat with patient hoist system.
- A static ambulance installation.
- Human patient simulators including augmented reality simulators.
- Virtual reality patient communication simulators.
- Low fidelity, high authenticity patient simulators.
- Trauma moulage including self-harm injuries.
- Psychiatric intensive care furniture.
- Bariatric and older patient adult simulators.

New Movement, and Sport Science Laboratories (Avery Hill, Sparrow's Farm)

Researchers in the **Centre for Exercise Activity and Rehabilitation** have also received significant investment providing brand new independent laboratories for: (i) Biomechanics; (ii) Strength and Conditioning; (iii) Physiology and Applied Biochemistry; and (iv) Body Composition and Human Assessments. The high-quality analytic equipment includes:

- Cortex Metalyzer -breath-by-breath expired air gas analyser (for measurement of oxygen uptake during exercise).
- Blood markers analysers (lactate, red blood, white blood, lipids, glucose)
- Humac Norm Isokinetic dynamometer (for measurement of muscle strength).
- 'Bod Pod' air displacement plethysmography (for measurement of body composition including body fatness).
- ASL eye tracker system.
- Doppler Ultrasound device (for measurement of subcutaneous tissues - such as vascular dimensions and blood flow velocity).
- 12 Qualysis Oqus camera system for 3D movement analysis
- Kistler triaxial force plate
- DeporTec -single axis force plates and adapted system for upper body (pull-ups, bench press, etc)
- Delsys Trigno Wireless EMG - Electromyography
- TMG – Tensiomyography to analyse evoked muscular function
- Optojump optical measurement system
- Win Laborat sports testing transducer
- Velowin – camera-based optoelectronic system to measure movement velocity
- Flywheel system for concentric-eccentric training without gravity
- Vibration training system (power plate)

New Neuropsychology Laboratories (Greenwich Campus)

The School of Human Sciences moved into new bespoke labs in the Dreadnought Building in Greenwich in 2018. These facilities have enhanced research activities, supporting the work of the **ILD Centres for Thinking and Learning, Mental Health, Inequalities, Chronic Illness and Ageing** and **Vulnerable Children and Families**. The facilities include: (i) three general-purpose cognitive psychology laboratories, two with high-end virtual reality gaming machines designed to track eye movement, and the other for facial recognition research; (ii) motion and gait lab; (iii) observation lab with high-definition recording suite; (iv) a social and developmental lab for children's developmental research. Key specialist equipment includes:

- Transcranial Magnetic Stimulation (TMS) MAGSTIM.
- Two 32 channels sets of Mitsar EEG.

Unit-level environment template (REF5b)

- Two sets of Biosemi 64 channels EEG with Biosemi amplifier compatible with TMS.
- Two sets of Nexus-4 biofeedback which can record such physiological responses as skin conductance, heart rate and pulse, ECG and EEG.
- Two sets of Edu-Logger for heart rate and two sets for Galvanic skin response.
- Two sets of HTC VIVE Pro (virtual reality) with a built-in eye tracking system (Tobii)
- Two Tobii Eye Trackers: (1) glasses with a built-in eye tracking camera, Tobii Pro Glasses 2, and (2) a small computer-based camera, Tobii Pro Nano, for eye tracking during computer-based experiments.
- AccuGait Force Platform.

New Biomedical Laboratories and equipment (Medway Campus)

Researchers in the **Centre for Chronic Illness and Ageing** and **Biomedical Science Research Group** have access to Medway research labs. Recently **Getti** led the design, development and management of a CAT 2 **Tissue Culture and Parasitology research laboratory**, supported by core funding from the Faculty (see also UoA6, UoA8). Researchers at Medway have unrestricted access to a state-of-the-art **LSM880 confocal microscope** with airyscan and cutting-edge electrophysiology rig funded by the University and coordinated by **Richardson**. The confocal microscope was a **£400,000** capital investment by the University commissioned in 2016, which has also significantly benefitted various research groups (**Richardson, Getti**) and other units (UoA6, UoA8). We have a strong cell and tissue culture portfolio for various applications, in line with NCR3 principles and two of our members head two distinct fully furnished state of the art modern tissue culture laboratories. The Faculty also funded the acquisition of an **Accuri C6+ Flow cytometer** to carry out cell analysis and an ultramicrotome to support preparation of biological samples for scanning transmission electron microscopy used by **Richardson, Getti**, and research groups including more than 50% of PGRs and post-doctoral research fellows working within our units (UoA6, UoA8). The second tissue culture laboratory is led by **Richardson** and specialises in molecular biology and cell urology, synthetic biology, recombinant protein production, transfection of plasmids, siRNA and antisense oligonucleotides, gene editing, immunofluorescence and electron microscopy, RTqPCR, molecular cloning, and mammalian cell culture as well as using 32p labelled DNA probes, western immunoblotting and immune-precipitations and gst pulldowns. The lab has the capability of following material through sub-cellular compartments using subcellular fractionation and microscopy and analysing gene function.

4. Collaboration and contribution to the research base, economy and society**Effectiveness of research collaboration**

The establishment of the ILD has provided a vehicle to support our existing research base and networks. Members of all seven Centres have made a substantial contribution to the research base, economy and society, locally, nationally and internationally. As outlined in Section 2 we have supported a range of research laboratory and networking visits to facilitate the development of our networks and host ILD Research Cafés, public lectures and stakeholder events.

Joint projects and international collaborations

ILD Centre staff have strong relationships and collaborations with numerous international universities, including Harvard, USA (Adjaye-Gbewonyo), the Universities of Rio Grande du Sol, Brazil (**Bernardi**), Universities of Bern, Hagen and Ferrera (**Birtel**), University of Aarhus, Denmark (**Dibley, Gomes Alves**), Universities of New Orleans and Penn State, USA (**Humayun**), University of Canterbury, New Zealand (**Maras**), Cordoba University, Spain (**Monks**), University of Warsaw, Poland, Case Western Reserve, US (**Moore**), First Affiliated Hospital of Soochow, China, and Amrita Institute of Medical Sciences and Research Centre, India (both **Ojo**), University of Windsor, Ontario, Canada, and University of North Carolina (both **Swaine**), McMaster, Canada, and Moscow City University, Russia (both **Uher**), Institute for Mental Health, Singapore, University of Addis Ababa, Ethiopia, (**McCrone**), University of Cape Town, South Africa (**McCrone, Pacella**), and Stanford University, and Tulane Medical School, USA (both **Weldon**).

The Centre for Vulnerable Children and Families is part of the *Australian Child Maltreatment Study (Pacella)*, a large interdisciplinary collaboration including ILD, QUT, UQ, Australian Catholic University, University of New Hampshire, University of Edinburgh, to measure the prevalence and burden of disease attributable to all forms of child maltreatment. It is one of the most comprehensive prevalence studies ever conducted with findings from this study key in informing policy and practice to prevent and reduce child maltreatment in Australia.

Pacella is also a member of the Global Burden of Disease study, funded by Bill & Melinda Gates Foundation, and set up the original comparative risk assessment (CRA) international collaborating group which has now grown to over 1000 members. In the REF period, **Pacella** has provided critical feedback on data sources, inclusion of risk factors, estimation process and results, and this work has led to several highly cited publications in the *Lancet*. **Pacella** is also part of a collaboration with the South African MRC on the National Burden of Disease and CRA study which informs priority-setting in South Africa.

The ILD has also hosted several international visiting researchers, including colleagues from the University of Seville, Spain; University of Córdoba, Spain; Complutense University Madrid, Spain; Instituto Universitário De Lisboa, Portugal; University of Modena and Reggio Emilia, Italy; University of Inonu, Turkey; Erasmus University, Netherlands.

A key indicator of the success of these collaborations is that almost half (46.5%) of our 859 outputs in this period were co-authored with international researchers, including: **Africa** (Ghana, South Africa, Tanzania), **Asia** (China, India, Iran, Israel, South Korea, Mongolia, Philippines, Qatar, Singapore, Turkey), **Australasia** (Australia, New Zealand), **Europe** (Austria, Belgium, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Netherlands, Norway, Poland, Portugal, Russia, Slovenia, Spain, Sweden, Switzerland), **North America** (Canada, USA), and **South America** (Brazil, Colombia). This has enhanced our international impact, with a **four-fold increase in Field-Weighted Citation Impact** from 1.62 in REF2014 to 6.39 in the current period and outputs **cited 36,054 times**, a three-fold increase from 10,193 in REF2014.

Engagement with key research users, beneficiaries or audiences

As outlined in Section 1 we are fully engaged with non-academic stakeholders and have significant local, national and international impact.

Roles as expert advisors

This is evidenced by the large number of staff involved with **National advisory boards** of non-academic bodies for example: Age UK; Irish Health Board (Donovan, see UoA20); South East London Sustainability and Transformation partnership – Alcohol Harms (**Foster**); Advisory Committee for Barnado's project funded by Department of Education (**Morgan**); Health Education England's Dementia-friendly Dentistry Board (**Newton**); Council of Dean's Research Advisory Group, and Association of UK University Hospitals Nursing, Midwifery and Allied Health Professionals Board (both **Weldon**). Staff also act as **Expert panel members/ academic advisors** to numerous non-academic organisations including the Nursing and Midwifery Council; Crohn's and Colitis UK IBD Nurse Specialist Programme (**Dibley**); The Early Intervention Foundation (**Humayun**); the World Health Organisation (Ibe); Go-fit research panel (**Naclerio**); Expert accreditor for the National Center for Academic Accreditation & evaluation (NCAAA), Saudi Arabia (**Weldon**).

We have strong ongoing local, national and international relationships as collaborators and partners with: **Public Health organisations**, including Public Health England, **Local Government organisations**, working closely with our local councils, Royal Borough of Greenwich and Kent and Medway; **local NHS trusts**, including Oxleas NHS Foundation Trust, Lewisham & Greenwich NHS Trust, Barts Health NHS Trust, South London and Maudsley NHS Trust, Dartford and Gravesham NHS Trust, Kent and Medway NHS and Social Care and Partnership Trust, Medway Community Healthcare, **Mental Health organisations** such as MIND; Activity and **Sport organisations** such as Charlton Athletic Football Club; **Workforce development and professional organisations** such as the Nursing and Midwifery Council,

Health and Care Professions Council, British Psychological Society, Social Work England, Health Education England, and the Association for Simulated Practice in Healthcare, and **organisations supporting Vulnerable Children and Families** such as NSPCC; and **Police** forces and associated professional bodies including the Metropolitan Police, Munich Police Stuttgart Police, Queensland Police Services, the Association of Chief Police Officers (ACPO), the Home Office, and the Police Federation.

Key NHS networks

ILD staff engage actively with our health partnerships including: Croydon Health services NHS Trust, Guys & St Thomas' NHS Foundation Trust, Kings' College NHS Foundation Trust, Maidstone & Tunbridge Wells NHS Trust, Truro & Penwith FE College with Royal Cornwall NHS Trust, Kent Community NHS Foundation Trust, London Ambulance Service NHS Foundation Trust, South East Coast Ambulance Service NHS Foundation Trust. We are a member of the *HEE Kent, Surrey, Sussex* network and the Nottingham-based *National Rehabilitation Centre (NRC) Academic Health Research and Education Partnership*, which will lead the NRC's research and training development, when operational in 2023. **Pacella** represents ILD/UoG on the Kent and Medway Joint Research Operation Collaborative group which includes NHS partners, with the aim of working together to enhance the potential for attracting and maintaining larger scale investment in the area and tailoring research to the needs of the local population. The ILD/UoG is a partner, and **Pacella** is also a named investigator, on the Health and Social Care Economics theme of the successful £9m NIHR Applied Research Collaboration Kent Surrey Sussex (**ARC KSS**) Led by Sussex Partnership NHS Foundation Trust and University of Kent and is involved in several projects and four PhD studentships (UoG, Chichester, Surrey) through this collaboration.

Enrichment of the environment

These relationships greatly enrich our research, numerous staff having published outputs with partner organisations: including NHS Foundation Trusts and Hospitals (Barts Health, **Dibley, Ojo, Weldon**; Bristol Eye Hospital, **Tadic**; Central and North West London, Button, **McCrone**; Great Ormond Street Hospital for Children, **Tadic**; Greater Manchester Mental Health, **Birtel**; Guy's and St Thomas', Hull & East Yorkshire Hospitals, both **Dibley**; Newcastle University Hospitals, **Stoner**; South London and Maudsley, Ibe, **McCrone, Ojo**; Sunshine Coast University Hospital, The Royal National Orthopaedic Hospital, both **Dibley**), charities and charity foundations (Bill and Melinda Gates Foundation, **Stoner**; McPin Foundation, **McCrone**; MIND, **Birtel, McCrone**). Our ILD Knowledge Exchange Fellow manages partnership and stakeholder engagement. Staff from partner organisations attend ILD events including the 2019 ILD launch and ongoing Public Lecture Series and online debates and support us in developing research ideas and pathways to impact.

Researchers from ILD's Biomedical Science Research Group are actively involved in specialist units, centres of excellence and spin-out research consultancies (e.g., Tissue Culture Laboratory and Intracellular Delivery Solutions (IDS) Ltd (**Richardson**); Tissue Culture Research Unit (**Getti**), with work on developing novel therapies to treat leishmania (**Getti**), and commercialisation of IP outputs (Patent for Antisense Oligonucleotide Compositions. WO2014203008. Granted by the European Patent Office June 2018; Patent applied for; Liposomes, filed with UKIPO August 2018 - Patent application: GB 1812992.4; both **Richardson**).

Indicators of wider influence, contributions to and recognition by the research base

ILD members make a substantial contribution to the national and international research base through numerous activities. A large number of professional roles with external organisations are held by ILD academics, including presidency of two organisations (International Union of Psychological Science (**Maras**); European Society for Research in Adult Development (**Robinson**)), plus membership of committees, advisory boards, expert panels and trusts such as: Age UK (Blackmore); Association for Simulated Practice in Healthcare, Association of UK University Hospitals Nursing, Midwifery and Allied Health Professionals Board (both **Weldon**); Barnardos i-HOP (**Morgan**); Barts Health NHS Trust Nursing, Midwifery and Allied Health

Professions Research Unit Board member, Crohn's & Colitis UK IBD Nurse Specialist Programme (both **Dibley**); BASES Sport and Exercise Psychology Accreditation Route (**Rossato**); Blenheim Project (**Foster**); clinical trial steering groups (**McCrone**); Diversity House (**Moreno-Leguizamon**); Dysphagia, Royal College for Speech and Language Therapists (Hansjee); Health Education England Midwifery Expansion Project (Bower); International Society for Political Psychology Early Career Committee (**Amer**); Early Intervention Foundation, Youth Endowment Fund Expert Panel (both **Humayun**); Health Education England's Dementia Friendly Dentistry Board (**Newton**); Future Emerging Technologies European Commission Programme (**Janacsek**); Primary Care Respiratory Society (Lawlor); Refugee Issues in Psychology, Australian Psychological Society (**Essex**); Royal Society of Chemistry: South East Region Analytical Division (**Nielsen**); World Health Organisation (Ibe).

In this period staff were external examiners on 80+ PhD viva exam panels at national (London School of Economics, Queens University Belfast, University College London, University of Kent, University of Nottingham, University of York) and international institutions (George Washington University, USA; Monash University, Australia; Tallinn University, Estonia; University of Agder, Norway; University of Cape Town, South Africa; University of Seville, Spain; University of Szeged, Hungary; University of Rome, Italy; University of Queensland, Australia, University of Valencia, Spain).

Staff also hold membership of numerous professional bodies across disciplines including: Psychology (Australian Psychological Society; British Psychological Society; Experimental Psychology Society; Society of Personality and Social Psychology), Nursing and Health Care (College of Paramedics; Health and Care Professions Council, Nursing and Midwifery Council, Royal College of Midwives, Royal College of Nursing), Counselling (British Association for Counselling and Psychotherapy; College of Sexual and Relationship Therapists; UK Council for Psychotherapy), Sports Sciences (American College of Sports Medicine; British Association of Sport and Exercise Sciences, UK Strength and Conditioning Association), and societies from diverse disciplines (Agriculture, Nutrition and Health Academy; Association for Simulated Practice in Healthcare; Association for Young People's Health; European Society for Prevention Research; Hungarian Academy of Sciences; Institute of Leadership and Management; Institute of Youth Work; Royal College of Speech and Language Therapists; Society for the Study of Addictions).

Editorial and peer-review activity

Staff hold a range of editorial roles across many disciplines:

Journal editorship - Drugs Education Prevention and Policy, International Journal for Epidemiology and Public Health Research, both **Foster**; Journal of Strength and Conditioning Research, **Naclerio**; Online Journal of Sports Medicine; Journal of Human Hypertension, both **Swaine**. *Associate editorship* - Addiction Research and Theory, **Gladwin**; Frontiers in Behavioural Neuroscience, **Janacsek**; Psychology, Society and Education, **Monks**; Paediatric Exercise Science, **Naclerio**; Clinical Skills, Rae; Emerging Adulthood, **Robinson**; Philosophical Transactions of the Royal Society B: Biological Sciences, **Uher**. *Editorial Board Membership* - Papers on Social Representations, **Amer**; Journal of Community and Applied Social Psychology, **Birtel**; International Journal of Risk and Contingency Management, Burns; Frontiers in Human Behavior, **Farmer**; International Nursing Review, Ferns; Nurse Education in Practice, Finnerty; Journal of Parapsychology, **Luke**; Psychology of Men and Masculinity, **Luyt**; Journal of Public Mental Health, International Journal of Environmental Research and Public Health, both **McCrone**; Journal of Aggression, Conflict and Peace Research, **Monks**; Nutrients, **Ojo**; Sensors, **Patchay**; Qualitative Criminology, Perrin; Frontiers in Psychology, **Uher**; BMJ Simulation and Technology Enhanced Learning, **Weldon**. *Special Issue editorship* - International Journal of Environmental Research and Public Health, **Foster**, **Ojo**; International Review of Social Psychology, **Gkinopoulos**; Men and Masculinities, **Luyt**; Frontiers in Public Health, **Moreno-Leguizamon**; Journal of Drug Targeting, **Richardson**; American Psychologist, **Robinson**; Journal of Theoretical and Philosophical Psychology, **Uher**.

Staff are also routinely involved in ad hoc reviewing for international, high impact Q1 journals in core research areas, including Cognitive Neuroscience and Psychology (*Addictive Behaviors, American Psychologist, Ageing and Mental Health, Cognition, Cognition and Emotion, Cortex, Journal of Experimental Psychology: Learning, Memory & Cognition, PLOS One*), Medicine and Nursing (*The Lancet, The Lancet Psychiatry, BMC Geriatrics, Journal of Advanced Nursing, Clinical Nutrition, Ophthalmology*), and Health (*Accident Analysis and Prevention, Critical Public Health, European Journal of Applied Physiology, International Journal of Drug Policy*).

Awards and fellowships

The work conducted by ILD staff has received widespread recognition from within and outside of their research and practice fields. Examples include honours: **OBE** for services to nursing and sexual health education (Evans). Scholarly awards: e.g., Rising Star of Crohn's & Colitis Research, Crohn's & Colitis UK (**Dibley**), Quality in Care Diabetes Award: Best initiative for children, young people, & emerging adults (Cai), Danubius Young Scientist Award (**Janacsek**), Parapsychological Association Annual Book Award (**Luke**), Winner of The British Journal of Midwifery Practice Award (Gale), Wiley's #1 Best of Nursing 2015 research paper (**Weldon**), Health Service Journal Patient Safety Award (Hansjee), QUT Vice-Chancellor's Award for Impact on Policy and Practice (**Pacella**). Research fellowships: British Academy Postdoctoral Fellowship (**Hartley**); Marie Curie Intra-European Fellowship (**Uher**); Fellow of the Experimental Psychology Society (**Samara**); Fellow of the British Psychological Society (**Luyt, Maras, Rossato**); Fellow of the Royal Biological Society & Chartered Biologist (**Richardson**).

Grant assessment

ILD staff also contribute to grant assessment for: **Research councils** (BBSRC, **Richardson**; ESRC, **Birtel, Davis, Maras, Monks, Poulter**; EPSRC, Burns; European Commission, **Janacsek**; European Research Council, **Monks**; MRC, **Tadic, Thompson, McCrone, Pacella**; NIHR, Crowley, **Foster, Humayun, McCrone, Ojo, Swaine**), charity trusts (Bowel Research UK, **Dibley**; British Academy, **Monks**; Guy's and St Thomas' Charity, **Humayun**; Macular Society, **Poulter**; Nuffield, **Monks**; The Leverhulme Trust, **Birtel, Davis, Maras**), and international agencies (Agence Nationale de la Recherche, **Naclerio**; Australian National Health and Medical Research Council, **Pacella**; Ireland Health Board, **Cleaver**; Israeli Science Foundation, **Farmer**; National Agency of Spain, **Monks**; Marie Skłodowska-Curie Actions, **Janacsek**; National Science Foundation, **Janacsek, Samara**; Netherlands Organisation for Health Research and Development, **Ojo**; Netherlands Organisation for Scientific Research, **Monks**; Swiss National Science Foundation, **Bowling**).

Keynote presentations and invited talks

Staff have given over 300 keynote presentations, plenary presentations and invited talks. A small selection includes: Global Risk Forum One Health Summit, Switzerland (**Collins, Eade**), European Crohn's & Colitis Organisation N-ECCO Research Forum, Spain (**Dibley**), Public Health England / Department of Health: Personalised Care and Population Health Conference, England (Evans), 8th International Conference on Imaging for Crime Detection and Prevention, Netherlands (**Davis**), Royal College of Midwives Education Conference, England (Finnerty), World Bank Group, USA (**Janacsek**), International Conference on Social Science and Humanities, Thailand (**La Placa**), 13th Conference, International Association for the Treatment of Sexual Offenders, Portugal (Perrin), International Congress of Psychology, Japan (**Maras**), European Conference on Interventional Oncology, France (**McCrone**), International Conference of Research and Intervention in Psychology and Education for Development, Spain (**Monks**), 1st Asia Pacific Conference on Integrated Care, Australia (**Moreno Leguizamon**), International Conference of Law Enforcement and Public Health, Netherlands (**Morgan**), International Congress of Sport and Leisure Activities, Ecuador (**Naclerio**), International conference on Diabetes, Nutrition, Metabolism & Medicare, Canada (**Ojo**), Wounds Australia Conference, Australia (**Pacella**), Transport Research Laboratory Annual Symposium, England (**Poulter**), ISSP World Congress of Sport Psychology, China (**Rossato**), Alzheimer Europe Conference, Netherlands (**Stoner**), Royal College of Ophthalmologists Annual Congress, England (**Tadic**).