

**Institution:** University of Liverpool

**Unit of Assessment:** UOA2 Public Health, Health Services and Primary Care

## 1. Unit context and structure, research and impact strategy

### 1A. Introduction

Our UoA2 academics work collaboratively across disciplines to address pressing local, national and international public health needs. Our **overall aim is to improve the health, wellbeing and life chances of societies across the globe, by conducting applied health research which is scientifically robust, and practice and policy relevant.** Our impressive academic appointments and our development of cross-sector research partnerships have led to substantial increases in funding and research outputs, with notable impacts on policy and practice.

### 1B. Unit Organisation and Structure

Our Unit has 43.4 FTEs (46 academics), who work in the **Institute of Population Health (IPH)**. IPH sits within the **Faculty of Health and Life Sciences (FHLS)**. In 2019, a restructure brought our Unit together physically and created four cross-faculty directorates to strengthen the infrastructure and powerfully support our work. The new structure has enabled greater cross-institute working and a more seamless integration of research and teaching (Figure 1).

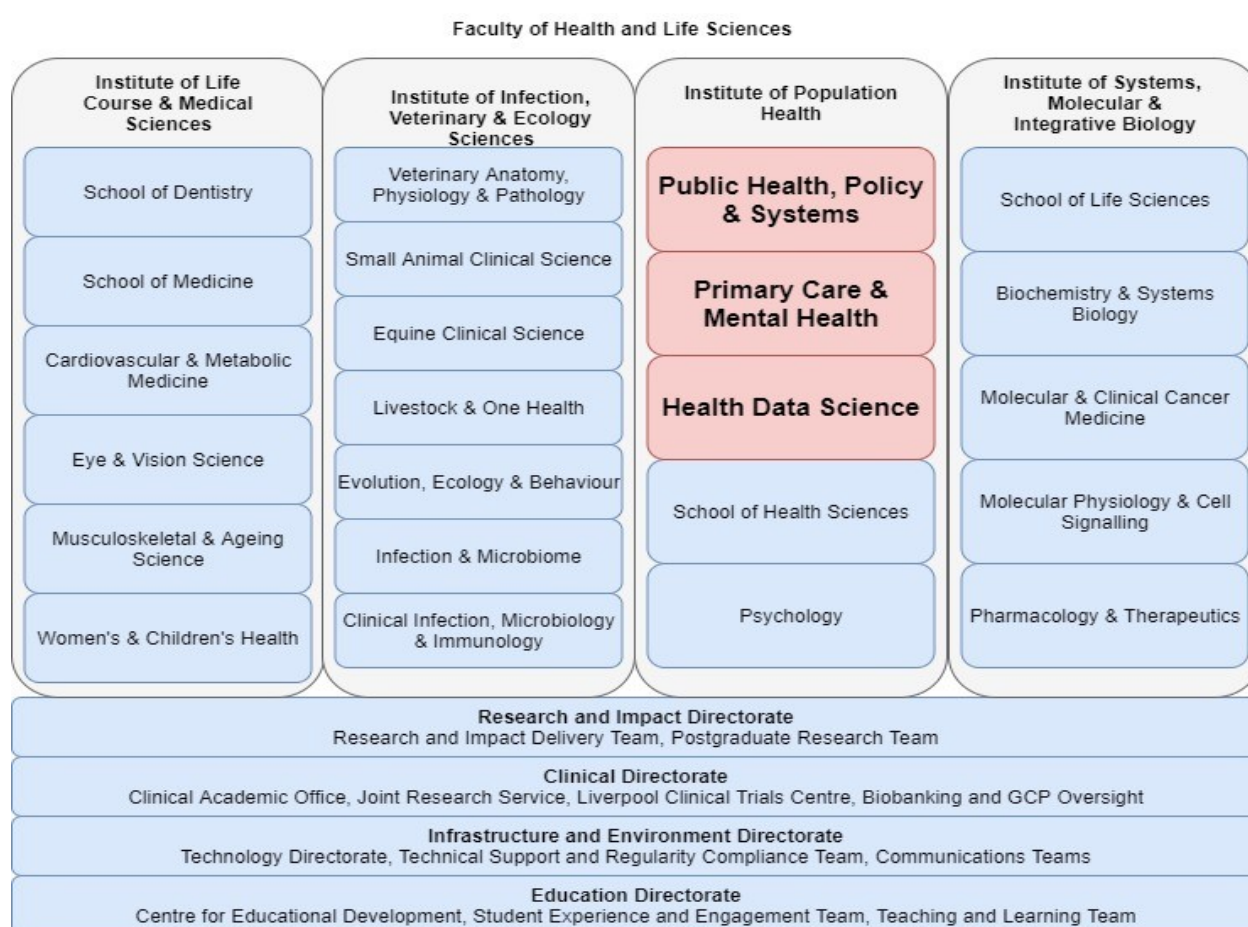


Figure 1: The new Faculty of Health and Life Sciences structure. UoA2 staff are now co-located in three complementary departments (highlighted in red).

Figure 1: The Faculty of Health and Life Sciences structure from 2019.

UoA2 staff are thus now co-located in three complementary departments (highlighted in red in Figure 1), each supporting a research group.

### *Research Groups*

We have organised our research activity into three interdisciplinary research groups:

- **Health Inequalities**
- **Primary Care and Wellbeing**
- **Trials and Methodology**

These groups reflect the priorities of our key stakeholders and partners - NHS, national and international. The groups also align with the University's research themes '*Starting well, living well and ageing well*' and '*Digital Health*'.

### 1C. Unit Research and Impact Strategy

Our three strategic priorities in the REF2014 submission were: identifying and supporting areas of international excellence, developing partnerships, and retaining and recruiting internationally recognised researchers.

Building on the REF2014 priorities, our current strategy comprises **five strategic principles**:

1. To foster a fair, inclusive, and supportive interdisciplinary research environment for all staff and students at every career stage.
2. To develop a diverse and sustainable funding base, with growth in awards to enhance our infrastructure and resources.
3. To invest and build on our unique strengths, with a particular focus on data science.
4. To employ best practice around research integrity, ethics, and open data.
5. To develop partnerships with end users to enhance the societal impact of our research.

These principles thus underpin our Unit's overall aim: ***to improve the health, wellbeing, and life chances of societies across the globe.***

### 1D. Delivering our Research & Impact Strategy

#### *Our Research Groups*

#### ***Health Inequalities***

Barr, Capewell, Collins, Fleming, Gladstone, Harris, Kierans, Kypridemos, Maheswaran, Mathur, McHale, O'Flaherty, Pope, Taylor-Robinson, Whitehead & Wickham.

We aim to improve health and reduce health inequalities locally, nationally, and globally, through the study of the determinants of health and wellbeing, and evaluation of the policies that impact on them. Strategic investment has expanded our capabilities in health economics (Collins, Maheswaran), policy modelling (Kypridemos), psychology (Wickham) and epidemiology (McHale, Schlueter). In recognition of their achievements, key staff members have also been promoted to chairs (Barr, Gladstone, Kierans, O'Flaherty, Pope, Taylor-Robinson). We have thus built an

interdisciplinary critical mass delivering impactful research across three linked programmes: policy research on the social determinants of health; non-communicable disease (NCD) prevention and food policy; and energy, air pollution and health.

### ***Primary Care and Wellbeing***

Brooks, Byrne, Dowrick, Gabbay, Lloyd-Williams, Noble, Perkins, Van Ginneken, Williams & Young.

We aim to improve primary care and the wellbeing of populations by producing knowledge of theoretical, practical and policy significance, with a focus on depression, long term conditions, severe mental illness, palliative care and marginalised communities. We have made strategic appointments (Williams, Van Ginneken) to build further capacity in primary care. Based on our studies of the structural, organisational and psychosocial factors that shape people's access to services, their care needs, treatment decisions and outcomes, we develop and evaluate interventions, from community level initiatives and randomised control trials (RCTs) of complex interventions through to policy developments.

### ***Trials & Methodology***

Bodger, Boland, Bonnett, Buchan, Burnside, Dodd, Donegan, Frith, Gamble, Geary, Garcia-Finana, Higham, Hill, Kolamunnage-Dona, Rodgers, Schlueter, Tudur-Smith, Williamson, Wilson and Woolfall.

We aim to improve population health by informing practice and policy through the design and delivery of world-class clinical trials, high quality epidemiological research and the synthesis of evidence in areas of strategic importance, supported by the development and advancement of underlying methodologies.

We lead the Liverpool Clinical Trials Centre (LCTC, Director: Gamble), which integrates our two internationally renowned Clinical Trials Units. The establishment of the MRC-NIHR Trials Methodology Research Partnership (£460K, Williamson, Tudur-Smith) builds on the achievements of the MRC North West Hub for Trials Methodology Research (Williamson, Gamble, Tudur-Smith £1.3M UoL, £1.6M total).

We have made key appointments to support our strategic expansion in the area of health data science (Buchan, Rodgers), and established the new Department of Health Data Science to support interdisciplinary research and further strengthen capacity. Funding successes include the Health e-Research Centre (Buchan, Capewell, Williamson, £4.9M MRC/NIHR) and Civic Data Cooperative (see Box overleaf).

### ***Interdisciplinarity***

Our Unit's research is built on multidisciplinary and interdisciplinary working, and includes 12 academic and clinical disciplines: *anthropology, bioethics, biostatistics, dental public health, evidence synthesis, epidemiology, health psychology, informatics, paediatrics, primary care, public health and sociology*. Our Unit publishes in an even wider range of disciplines (Figure 2).

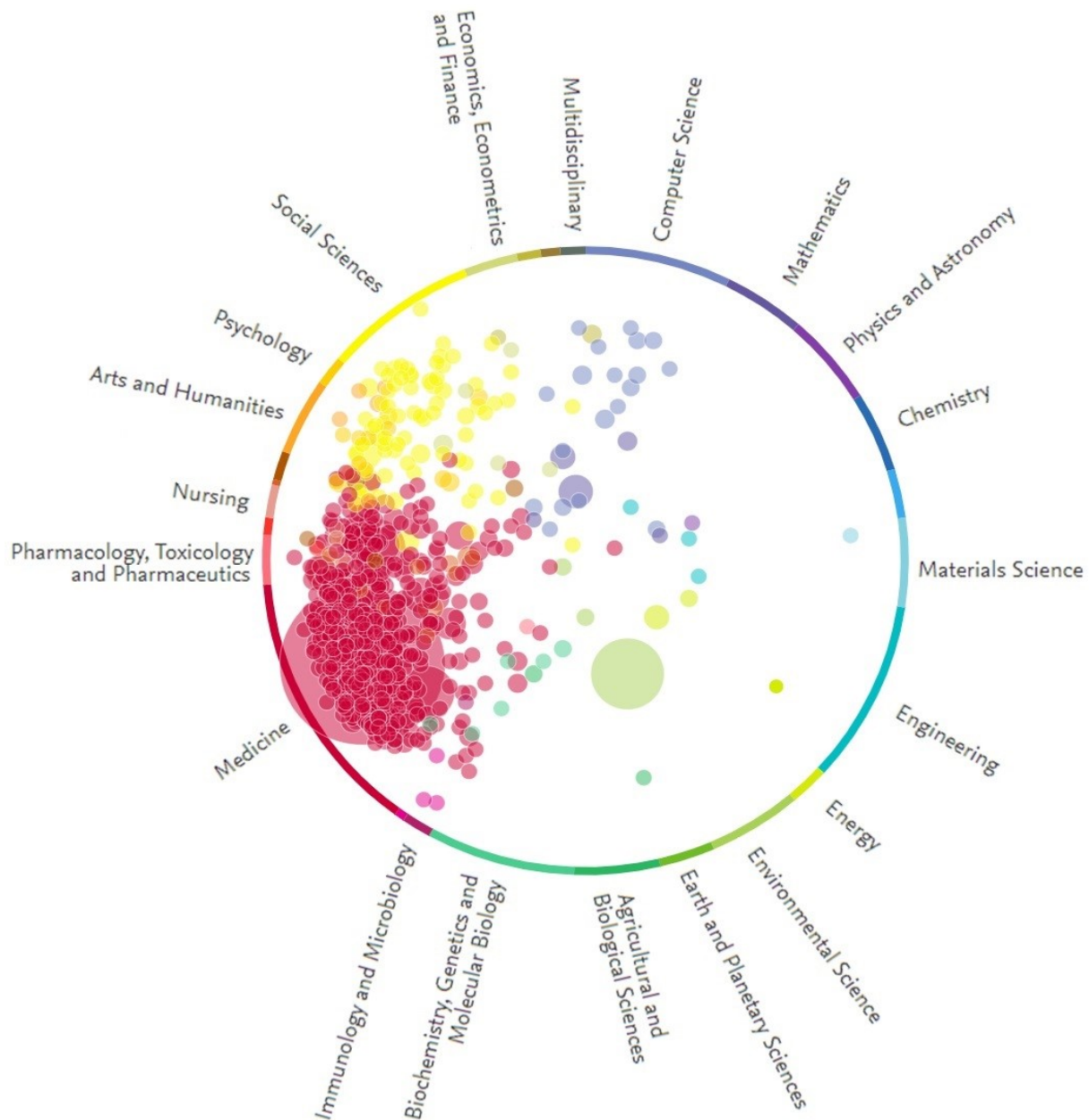


Figure 2: Topic analysis for all University of Liverpool UoA2 publications in the REF period. Each dot represents a distinct SciVal topic in which we have published; dot size indicates the number of publications in that topic (Source: SciVal).

**We have been successful in winning substantial funding for collaborative initiatives that involve all three research groups**, catalysing further interdisciplinary research (Box below).



**C-GULL** will be the **first major UK birth cohort for over a decade** (£5.2M, Wellcome Trust - Taylor-Robinson, Williamson, Buchan, Rodgers, Fleming). Launching in 2021, C-GULL brings together citizens, researchers and clinicians to harness the power of data

linkage and modern, intensive phenotyping to study the connected determinants of child health and NCDs. It will recruit 10,000 babies born in the Liverpool City Region and their families. C-GULL will be a rich research resource with exciting opportunities for add-on studies and links with the existing Danish National Birth Cohort, Born in Bradford and ALSPAC cohorts.



**Liverpool Civic Data Cooperative (CDC):** The UK's first CDC will link anonymised health and care records across the city region in a secure environment, building a substantial new tool for health research. With a £5M grant from Liverpool Combined Authority (Buchan, Rodgers, Williamson, Fleming, Barr, Frith) reflecting buy-in at the highest levels of regional policymaking, the CDC will complement C-GULL, and enable large-scale natural experiments of international significance.



The **ARC North West Coast (ARC NWC)** (£9M, NIHR, 2019-24, Director: Gabbay) brings together a network of 61 health and social care partners across the region (Clinical Commissioning Groups, borough councils, NHS Trusts, charities and third sector organisations), and a well-established public adviser forum, to collaborate and deliver excellent applied research. It has a focus on health inequalities (Barr), informatics (Rodgers) and PPI (Frith). This builds on the success of the Collaborations for Leadership in Applied Health Research and Care (CLAHRC) 2014-19, also led by Gabbay.

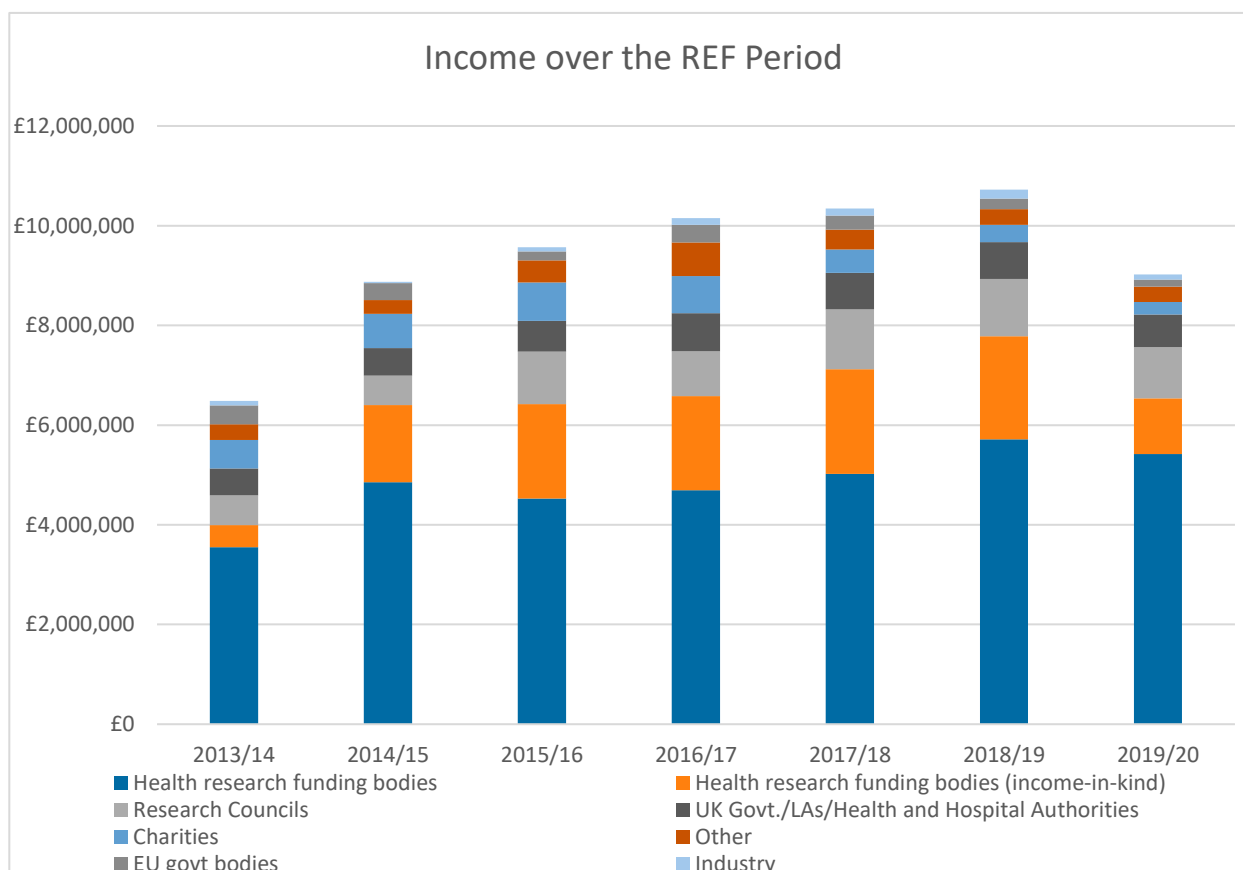
Our interdisciplinary research is further strengthened by interdisciplinary training programmes (see 4D) and by University-funded initiatives including The Centre for Humanities and Social Sciences of Health, Medicine and Technology (Director: Kierans) and the Translational Research Access Programme Fund.

### *A Vibrant and Diverse Research Environment Underpinning Success*

**People:** While the overall number of FTEs in the Unit have remained stable, we have strategically recruited the brightest external talent, and have ensured career progression for existing staff. Our registered PGR headcount has increased by 22%, from 67 in 2013/14 to 82 in 2019/20, and 104 PhD students have graduated (completion rate 80%). In recognition of our work on gender equality, we gained an Athena SWAN Silver Award in 2016.



**Funding:** Our income has increased by 28% since the start of the REF period (detailed in Section 3). We have led a number of significant new initiatives, including C-GULL, the CDC and an NIHR Global Health Research Group (Clean-Air Africa). In addition, renewed funding has been won for several large initiatives and centres of excellence, including: WHO Collaborating Centre, membership of NIHR's School for Public Health Research, NIHR CLAHRC & NIHR ARC NWC, MRC North West Hub for Trials Methodology Research, and MRC/NIHR Trials Methodology Research Partnership (Figure 3).



*Figure 3: Research Income by income source 2013/14 to 2019/20*

**Publications:** We have published 1,323 peer-reviewed outputs over the REF period with 9% of our outputs having an Altmetric Attention score exceeding 100. These outputs have an average field-weighted citation impact score of 4.3 for papers with international co-authors, and 2.8 overall, with 20.1% of the outputs being in the top 10% most cited publications worldwide (field-weighted; source: SciVal).

**Enhanced infra-structure:** Since 2014, we have invested over £20M in new buildings and facilities, redevelopment, and digital infrastructure capability (detailed in section 3B).

**Partnerships:** We work with a wide range of partners locally, nationally and internationally, including co-authoring papers and reports with partners based in over 100 institutions across five continents (see Section 4).

*Unit-Wide Growth and Success since 2014*

Our achievements demonstrate the success of our five strategic principles (Figure 4).

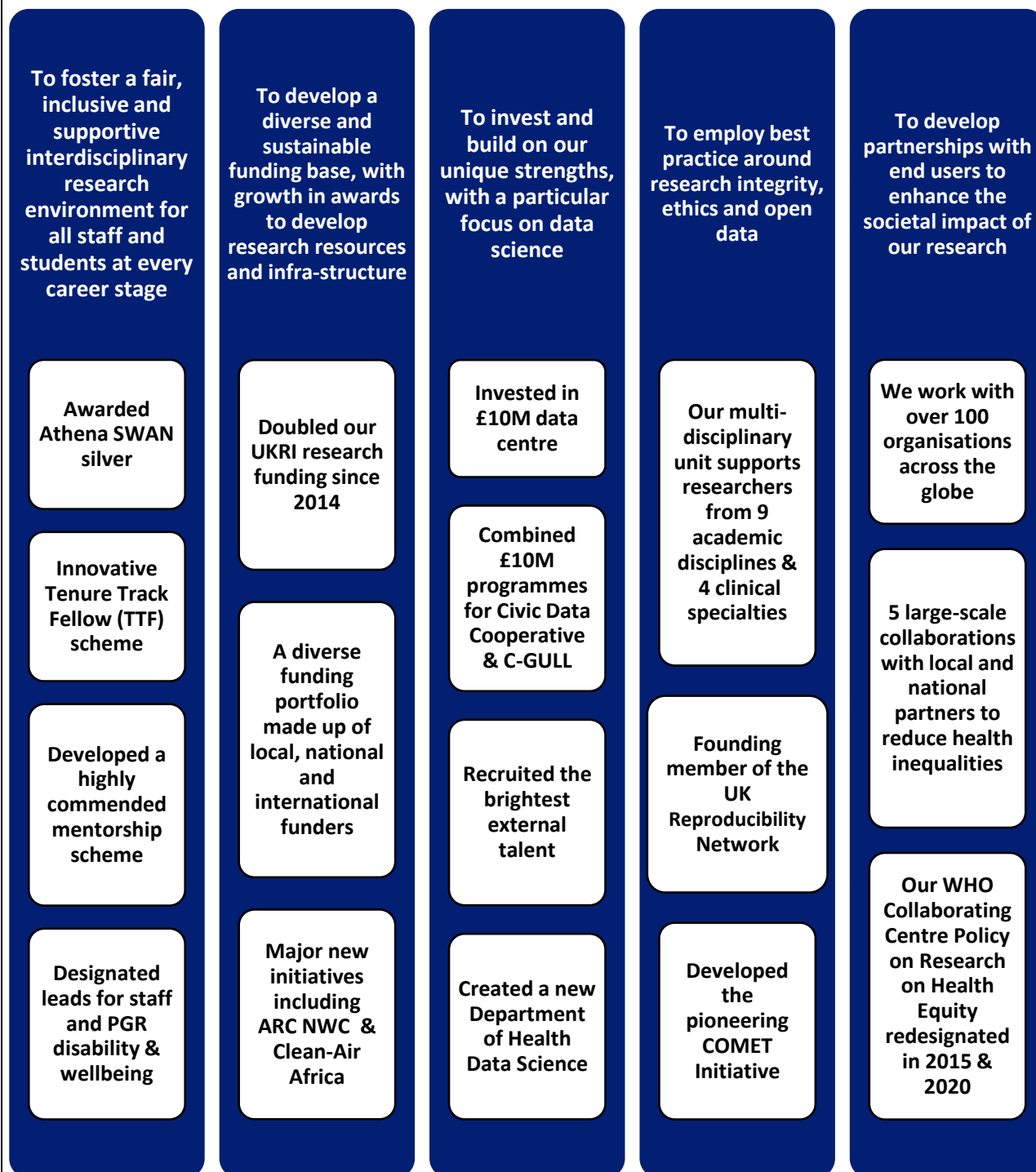


Figure 4: UoA2 Research and Impact Strategy 2015-2020: Exemplars of progress

1E. Supporting Impact

Since 2014, we have invested heavily in each step of the impact 'pipeline', increasing the range and scope of support year-on-year. Our strong impact culture is now supported by a **dedicated Impact Officer** who works closely with researchers. FLHS holds regular '*Impact Matters*' **seminars** and '*Making an Impact*' **workshops**, where colleagues can share best practice and build capacity. We have been awarded **HEIF (Higher Education Innovation Fund) funding** and **Impact Accelerator Awards** competitively to further develop impact-focussed activities, building on awarded research grants. The success of these initiatives is demonstrated by the strength of our four Impact Case Studies (Figure 5 below), the additional impact case studies being returned in other UoAs (Williamson UoA10, Frith UoA30) and substantial additional impacts detailed in Section 4.

Case-study summary	Internal funding	Impact Officer time allocated
Informing public investment for health equity: Assessing government policy impacts on health, poverty and inequality (Impact case: UoL48HealthEquity, Whitehead, Taylor-Robinson & Barr)	£7,730 – Interviews with local policymakers and parliamentarians	1 month
Equitable access to clean energy for the prevention of non-communicable disease (Impact case: UoL65CleanEnergy; Pope)	£7,580 - Travel to Cameroon	1.5 months
Food Policies & Disease Prevention – the IMPACT model (Impact case: UoL49IMPACTmodel; Capewell & O'Flaherty)	None required	2 months
The Malawi Developmental Assessment Tool (MDAT): A cheap, globally accessible, open-access child developmental assessment tool enabling robust investments to improve child outcomes (Impact case: UoL50MDAT; Gladstone)	£15,770 – Collection of feasibility data and travel to Malawi	4 months

*Figure 5: How we supported our four UoA2 Impact Case Studies*

Public Engagement

We deliver a wide-ranging public engagement (PE) and Public and Patient Involvement (PPI) programme coordinated by a **Faculty Public Engagement Team** (2.6 FTE). This includes support incorporating PE/PPI into research and developing PE/PPI projects; PE & PPI funding, and an annual showcase event (both funded by our Wellcome ISSF). Exemplars have been showcased, winning a Faculty Research Impact of the Year Award (Pope's Clean-Air Africa, Winner 2016) and a Faculty Public Engagement and Involvement Award (Harris's RETURN dental care inequalities project, Winner 2019). The importance of impact is also recognised and commended in staff annual personal development reviews.



1F. Positive Research Culture*Open Research*

**Liverpool has powerfully shaped the Open Research agenda;** Our UoA2 staff have led international consensus-based guidelines for Data Sharing (Tudur-Smith, MRC) and Statistical Analysis Plans (Gamble, Williamson) published in JAMA, including a webinar distributed through the UK Reproducibility Network. Our evidence-based guidance for sharing individual participant data from publicly funded clinical trials (Williamson) is now endorsed by the major UK funding bodies (UKRI, MRC, Wellcome Trust, NIHR), and the UKCRC-registered Clinical Trials Units network, and is referenced in the NIHR Clinical Trials Toolkit. A new online system is under development to facilitate the sharing of data from Liverpool Clinical Trials Centre trials.

We exceed **Open Access** (OA) publication requirements by publishing via open access platforms such as medRxiv. The percentage of articles published as gold open access has risen substantially, from 54% in 2014 to 92% in 2019, supported by University funding (£200k to ensure open access compliance for 124 articles that have not been covered by the funder). Our Liverpool Elements online tool now optimises OA by providing a one-stop system for recording and managing outputs to the Institutional OA Repository, and enables staff to monitor and optimise compliance, working with researchers to resolve non-compliant publications.

Our Unit also promotes compliance with the UKRI Concordat on Open Research Data including making software and coding available open source e.g. Kypridemos & O'Flaherty's *IMPACT<sub>NCD</sub>* model. The **Research Data Management team** is a recent University investment which provides valuable advice, tools and support to help Liverpool researchers manage and share their data and comply with University and funder policies.

*Integrity, Ethics and Standards*

The University of Liverpool was one of the first 12 academic members of the **United Kingdom Reproducibility Network** (UKRN), a peer-led consortium which coordinates reproducibility efforts across the sector, by investigating the factors that contribute to robust research, providing training in research integrity and data management, and disseminating best practice. It includes representation from research councils, major journals and 47 local academic networks (Williamson).

All the Unit's research complies with the University's research ethics, governance and integrity policies.

FHLS's three **research ethics committees** are tailored for studies not covered by NHS research ethics approvals. **Frith** chairs the IPH Faculty Research Ethics Committee, which has been commended by the University for its review quality and fast turnaround.

The University provides a suite of online courses to give researchers an essential understanding of responsible research practice:

- All researchers complete the Epigeum Research Ethics and Research Integrity online courses.
- The cutting-edge one-week clinical trials course, organised by Liverpool Clinical Trials Centre (LCTC), includes sessions on reducing research waste, integrity and reporting standards.

Unit-level environment template (REF5b)

- Our PhD students are required to attend compulsory training workshops that focus on principles of data management, reproducible research, ethics and open science.
- Research Ethics Drop-In sessions further support researchers in making robust ethics applications.

1G. Strategic Objectives 2021-2025

**Building on our substantial accomplishments during this period, we are confident of our ability to sustain and enhance our thriving research environment into the future:**

We have made significant advances against our research and impact strategy between 2014-2020 (Section 1C). Building on our existing strategy, we have refined and agreed our strategic objectives over the next REF period to 2025:

- Maintain and enhance engagement with policymakers and clinicians to translate research evidence into more effective public policy and service provision.
- Establish a new Centre for Health Economics.
- Further develop our portfolio of data assets and methods, including via C-GULL and the Civic Data Cooperative.
- Establish a Masters in Data Science to build capacity and grow PhD activity.
- Invest £700k in PhD studentships to increase capacity in three priority areas – primary care, data science and health economics (see Section 2.B)

## 2. People

### 2A. Staffing Strategy and Staff Development

#### *Introduction and Principles*

Our Unit has 43.4 FTEs, comprising 46 individuals: 22 professors, 3 readers, 9 senior lecturers, 9 lecturers, and 3 research fellows. Seven of these 46 are classed as early career researchers (ECRs).

Two of our strategic principles (Section 1C): **“To foster a fair, inclusive and supportive interdisciplinary research environment for all staff and students at every carer stage”** and **“To invest and build on our unique strengths, with a particular focus on data science”** have particularly informed our staffing strategy for the period.

Since 2014, we have

- majored on the development of staff at all levels, including a suite of measures to meet the needs of ECRs and clinical academics,
- promoted and retained excellent researchers through robust, criterion-based processes,
- recruited strategically to bolster key areas and support succession planning,
- enhanced our policies for ensuring Equality, Diversity and Inclusion (EDI), and
- actively aligned our approach with the Concordat to Support the Career Development of Researchers.

#### *Staff Development for All*

**Staff Development** is centrally co-ordinated and delivered by the Staff and Academic Development Academy (**The Academy**) which offers a wide range of courses, coaching and facilitated ‘action learning’ with peers.

Since 2014, we have progressively improved the quality and utility of our annual **professional development reviews** via mandatory training and regular feedback sessions for reviewers and senior management, thus promoting a continuous quality evaluation cycle. Heads of Department (HoDs) agree personalised development plans and ensure equity of workload (Concordat Principles 2, 3, 4, 6).

All HoDs are trained through the University **Leadership Framework Programme**, which is recognised by the Institute of Leadership and Management. In 2019, 43 staff joined the Leadership@Liverpool programme led by Advance HE and funded by a Wellcome ISSF award.

#### *Developing Early Career Researchers and Fixed-term Researchers*

We endorse and amplify the Concordat principles via multiple Institute initiatives to meet the needs of our fixed-term researchers and ECRs.

#### **Networking**

Our **ECR Leadership Network** provides a valued community forum for ECRs. This includes social events where ECRs and senior academics come together to exchange ideas, network and learn about each other’s work in a relaxed atmosphere (summer picnics, historic guided walks, and, since March 2020, online events).

### Training and Development

- Our **IPH Institute Careers Coaching Scheme** supports the development of both fixed-term researchers and core-funded female researchers. Identified by The Academy as an exemplar of best practice, this scheme has been rolled out across the University (Concordat Principles 3, 4, 5, 6) and is now delivered online.
- IPH runs regular seminars to **support ECRs in grant writing** and **preparing fellowship applications**.
- IPH has provided funding for ECRs attending 21 **conferences** (17 UK, 4 international)
- All departments run regular research seminars where ECRs are encouraged to present.

### ECR and Returners Fund

Since 2017, the University has provided competitive seed funding for ECRs and those returning to research to produce preliminary data, travel to help make collaborative links, and to gain experience as a grant-holder. We also competitively award Wellcome ISSF funds to ECRs (see 3A). In 2018, **Sara Ronzi** was funded to explore household air pollution at the University of Buea. She is now PPI lead for Clean-Air Africa, Visiting Lecturer at Buea and secured an ESRC Festival of Social Sciences engagement grant.

### ECR Career Paths



Showcased in the Times Higher Education (panel opposite), our **Tenure Track Fellow (TTF) scheme** enables ECRs to pursue independent research careers by reducing their administrative and teaching roles. Since 2014, three new TTFs have progressed to tenured positions, winning £1.6M in funding, further demonstrating our supportive environment (Concordat Principles 1, 2, 3):

ECR	TTF Status
Sarah Donegan	Now Tenured
Adam Noble	Now Tenured
Kerry Woolfall	Now Tenured
Laura Bonnett	Current
Brendan Collins	Current

We also provide **bridging funding** for contract researchers between fixed-term contracts, for example those waiting to hear the outcome of postdoctoral fellowship applications (Held, Sharkey, Taylor, Wilm, Wickham, Smith). This represents invaluable support at a critical time for ECRs developing an independent research career.



**Bridging Funding Case-Study: Dr Sophie Wickham**, Research Fellow in Public Health, was appointed as a postdoctoral researcher in 2014. She was mentored by Barr and Taylor-Robinson and awarded a Wellcome Trust Small Grant (£5,000) in 2015 to develop statistical and data management skills, to prepare for a Wellcome Trust Fellowship on child and maternal mental health and health inequalities. IPH provided bridging funding to support the development of her fellowship application, successfully awarded by Wellcome in 2016.



**ECR Careers Case-Study: Dr Kerry Woolfall** joined in 2010 as a Research Associate. Supported by IPH staff (Young, Gamble, Frith) she applied successfully for a Wellcome Trust Post-Doctoral Fellowship in Bioethics in 2014. She then secured substantial research funding, a Tenure Track Fellowship in 2015 and was appointed as a Senior Lecturer in 2017.

Our Unit is submitting seven ECRs. Since 2014, these staff have received a total of £882k funding:

Staff name	Date of first independent contract	Funding scheme
Laura Bonnett	2017	NIHR Post-Doctoral Fellowship, then TTF
Helen Brooks	2017	IPH Institute
Brendan Collins	2018	TTF
Chris Kypridemos	2018	IPH Institute
Philip McHale	2020	MRC Training Fellowship
Daniela Schlueter	2019	IPH Institute
Rebecca Wilson	2018	HDR UK

#### *Promotion, Retention and Strategic Recruitment*

Our **robust, criterion-based academic promotion processes** explicitly recognise and reward staff achievements. Since 2015, a panel of senior academics help prepare and support staff applying for promotion or tenure. This has proved successful, with 10 promotions to Professorships, 7 to Readerships and 12 to Senior Lectureships.

**We have recruited strategically since 2014**, making 28 new academic appointments: 5 at Professorial level, 17 at Lecturer/Senior Lecturer/Reader level and 6 ECRs. The demographic profile of our Unit is now well-balanced across junior, mid-career and senior colleagues, ensuring a clear pathway for succession planning. Most unit staff are on permanent contracts, with seven on fixed-term contracts linked to ongoing fellowships.

**Our strategic recruitment in data science** has been very successful (examples in box below).



**Strategic Recruitment Case-Study: Prof Iain Buchan**, Chair in Public Health and Clinical Informatics, joined in 2018 as part of our strategy to boost data science. He has since won awards exceeding £10M, and co-created and won a further £11M. These include infrastructure funding for a Civic Data Cooperative (CDC) and Combined Intelligence for Population Health Action platform (CIPHA) which is supporting local and national COVID-19 responses. Buchan has taken on significant leadership roles: Executive Dean of the Institute of Population Health, and Director of Digital Strategy and Partnerships for Liverpool Health Partners.



**Strategic Recruitment Case-Study: Prof Sarah Rodgers**, Professor of Health Informatics, was recruited in 2018 to further boost our data science expertise. She specialises in evaluating natural experiments and non-randomised intervention studies using anonymised linked administrative and health datasets. She now leads ARC NWC's Care and Health Informatics theme, is a Co-Investigator on the C-GULL study and leads an NIHR-funded study on how access to outdoor spaces affects mental health and wellbeing.

#### *Developing and strengthening our clinical academic career paths*

Since 2014, **Liverpool Health Partners (LHP)**, has helped to integrate University and wider NHS resources and coordinate health research across Merseyside (see Section 3B).

We provide specific support and mentoring at each stage of the HLS Faculty's integrated clinical academic training pathway: recruitment, research, training and development. This is co-ordinated by our Clinical Directorate **ICAT team**, reflecting local, regional and national priorities, and strengthened by our recently appointed **Director of Clinical Academic Development**. Our Annual Review of Competency Progression (**ARCP**) is considered an exemplar by Health Education England, and is now being trialled in other locations.

This tailored support for **Academic Clinical Fellows (ACFs)** has led to 88% of ACFs progressing to PhD training, (far above the national average of 50%), with 100% of 20 NIHR ACFs progressing to Wellcome or MRC PhD studentships.

Our **Academic Clinical Lecturers (ACLs)** receive additional support through protected academic time. Our new, three year, **senior clinical fellowship scheme** (co-funded by University and NHS) to support the development of externally funded, intermediate-level clinical fellowships now facilitates the retention of talented ACLs to senior clinical academic posts.

Within **Public Health**, our Health Inequalities Research Group has particularly focused on support, building a cadre of outstanding fellows well-placed to become independent research leaders. Two clinical lecturers have gained Fellowships (McHale, 2020-24, MRC Clinical Research Training Fellowship and McPherson, 2015-20, Wellcome Career Development Clinical Research Fellowship). A Speciality Registrar on an academic placement was awarded a NIHR Doctoral Fellowship (Barr, 2010-2015), which then served as a springboard to a Senior Clinical Lectureship, then chair in 2019.





**Clinical Academic Careers Case-Study: Prof David Taylor-Robinson** was appointed as a Senior Clinical Lecturer in 2014. He was awarded successive MRC fellowships (Population Health Scientist, then a Centenary Award) and was mentored to develop a successful MRC Clinician Scientist Fellowship (2017-22), a first in public health. This prestigious award led to his promotion to chair in 2017. He now leads a productive and rapidly expanding research group.

We have substantially increased our staff in **academic general practice** to build capacity and ensure succession planning, with five staff newly recruited or promoted since 2014. Professor Nefyn Williams joined in 2018. We thus now have four Professors (Gabbay, Williams, Lloyd-Williams, Dowrick), one Academic Clinical Lecturer (Van Ginneken), two Academic Clinical Fellows (Rylands, Harvey) and a clinical fellow (Ali). The fellows are mentored by senior staff and are employed clinically at Brownlow Health, the most active research practice in the area and a member of ARC NWC. We have a well-developed clinical research ‘hub and spoke’ system across the Central Liverpool Primary Care Network.



**Strategic Recruitment Case: Dr Nadja van Ginneken** is an NIHR Clinical GP Lecturer appointed in 2015 as part of our efforts to build capacity in Primary Care. She has since won several research grants (from NIHR and Liverpool CCG Research Capacity Fund) spanning adult and children’s mental health, and coronavirus. She described the ACL post as “ a fantastic stepping stone to further develop my research career in primary mental healthcare, whilst still maintaining my clinical work in general practice.”

#### *Academic Careers in Trials and Methodology*

The **Liverpool Clinical Trials Centre (LCTC)** provides tailored trial training and support to **NIHR Trainees**. Between 2014-2020 LCTC have supported:

- 4 NIHR Clinician Scientist awards
- 3 NIHR Clinical Trial fellowships
- 2 Career Development Fellowships
- 1 Senior Research Fellowship
- 1 NIHR Advanced Fellowship
- 9 NIHR Doctoral Fellowships

These have resulted in several large EME grants (Miller, Flohr) and promotions (e.g. Perry was promoted to Professor in Orthopaedics following his Clinician Scientist Award).

*Sabbaticals and Exchanges*

The University's **Research Leave Policy** enables all academic members of staff to take time to further their research. During her sabbatical leave in 2018, Kierans produced a highly rated monograph, with promotion to a chair in 2020.

Our ECR placements have provided **policy interface** experience via our WHO Collaborating Centre. Two PDRA's and six Registrars worked on the WHO Europe Health Equity Status Report Initiative, including three placements at the WHO Venice Office (2017-19), plus exchange visits by researchers from Venice and Moscow.

Our collaborative funding applications with local authorities and CCGs also create policy placements and secondments for our PhD students and ECRs. Three PhD students had 3-month placements in 2019/20 in public health, planning and children's social care departments, and a further PDRA was seconded to Liverpool CCG.

2B Building the best possible environment for our Research Students*Recruitment and Successful Completion*

Since 2014, UoA2 staff have supervised 104 doctoral students. Our PGR headcount has increased from 67 in 2013/14 to 82 in 2019/20, with average doctoral completions per FTE increasing from 1.5 to 2.3. Over 80% of our PhD students submit within 48 months. Our 2017 Postgraduate Research Experience Survey showed 90% overall satisfaction, and all measures were within the sector's top quartile.

*Growing Our PGR Numbers*

To sustain and grow our research groups, IPH provides substantial match-funding of studentships. Since 2014: £127K in student fees (20 students), £367K in student maintenance (17 students), an additional £202K (22 students) in student fees, and £526K (18 students) in student maintenance committed up to 2023/24. We have also won NIHR Technology Assessment Reviews grants to support 10 staff to pursue higher degrees (3 PhDs already completed). We recruit students according to EDI principles, facilitated by staff training and monitoring, (see section 2C); 22% of our PGRs come from BAME communities.

*Postgraduate Oversight and Monitoring*

All UoA2 staff have undertaken The Academy's supervisor training. Each student has an annual **Independent Progress Assessment Panel** review to ensure that they receive optimal supervision and support. Clinical MD/PhDs undergo academic and formal Annual Reviews of Competence Progression.

*Integration and support of post-graduate students*

Crucially, our PhD students are represented on all our Institute and Faculty PGR committees. They are also given diverse opportunities to participate in Faculty academic life (<https://www.liverpool.ac.uk/pgr-development/offering>), including:

- Presenting at Annual Institute **PGR Research days, PGR Poster days** and prizes.
- Leading the Institute PGR Society (journal clubs, networking and 'drop-in' coffee sessions).
- **Communication Skills and Outreach Activities** facilitated by a dedicated **Public Engagement Officer**, (see section 4C).

Moved online from March 2020, these activities are now further supported and resourced by Prof Sanderson, FHLS's new Dean for Postgraduate Affairs.

*Doctoral Training and Placements*

Coordinated by The **Liverpool Doctoral College**, our **Institute doctoral training infrastructure** provides a suite of training development, and helps postgraduate researchers progress into their post-doctoral careers:

- Since 2014, seven **ESRC DTP** students have enjoyed 19 subject-specific and thematic training pathways within IPH; notably the Health and Wellbeing pathway (lead Lloyd-Williams) and Advanced Qualitative Methods Course (lead Kierans).
- **Training programmes** successfully building multidisciplinary cohorts of students within the MRC HTMR and MRC/NIHR TMRP doctoral training programmes
- **NWC CLAHRC** (12 PhD studentships) research training in public involvement and health inequalities research.
- **EU Marie Curie MIROR** (Methods in Research on Research) Innovative Training Network: a multidisciplinary joint doctoral training programme, to improving the quality of health research (€3.9M, 2016-20). Five PhD fellows have enjoyed secondments which enhanced their skills and provided extensive networking opportunities (BMJ, NICE, Cochrane, Novartis, and European Clinical Research Infrastructure Network).

*Preparing Students for Future Careers*

Alongside core research training, we prioritise transferable **professional skills** (business, entrepreneurial and communication skills), and broad **scholarship skills** (networking, knowledge dissemination, demonstrating impact and public value). Over 90% of our PhDs/MDs are employed or in further study within 6 months of graduating.

2C. Equality, Diversity and Inclusion (EDI)

IPH is committed to providing an inclusive environment which recognises and values people's differences and supports all staff and students in maximising their potential to succeed.

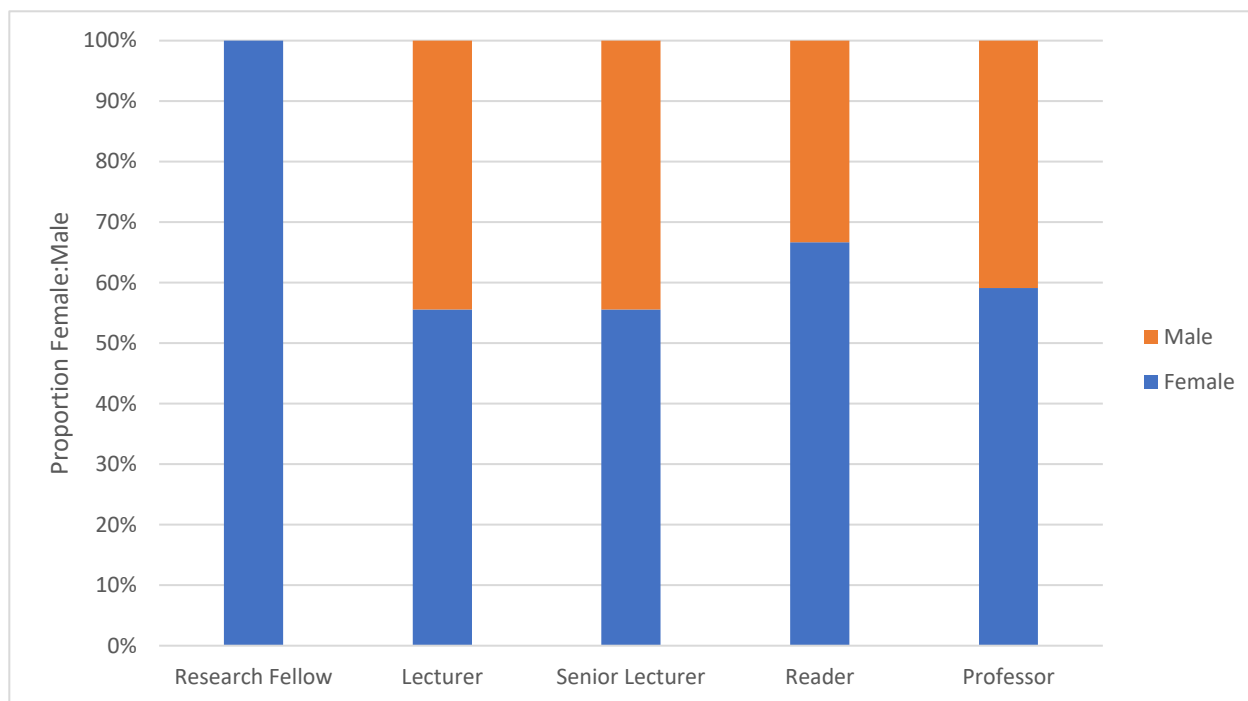
Since 2014, IPH has taken substantial initiatives to promote EDI:

- **Promoting an inclusive culture.** All our staff benefit from policies and activities led by the University as a member of the Athena SWAN Charter, Stonewall Diversity Champion, Disability Confident and Time to Change.
- **Compulsory Equality and Diversity training** and **Unconscious Bias training** ensure that all staff are aware of their rights and responsibilities around all protected characteristics (Concordat Principle 6).
- **Gender-balanced panels for recruitment and promotion**, where all have received equality and diversity and unconscious bias training.
- **Guaranteed Interview Scheme** means we invite to interview all disabled applicants who meet the minimum role criteria.
- Our **University Race Equality Charter application**, including the new 'Research in an Inclusive and Sustainable Environment' (RISE) Project.

We have embedded EDI principles into our all our procedures and work, appointing specific leads:

- IPH EDI Lead (Hussain).
- Disability Lead (Hill)
- PGR Disability Lead (Kypridemos)
- EDI departmental lead and BAME staff network representative (Hassan).

Our IPH **Silver Athena SWAN Charter Award** reflects robust systems for analysing our practices and culture and ensuring gender equality of opportunity for all our staff and students. 62% of UoA2 Category A staff are women, with 10 female Professors acting as role models and mentors (Figure 6):



*Figure 6: UoA2 gender balance by job category.*

Since 2014, the number of women on management committees and senior management teams has consistently increased (7 out of 8 committees now meet or exceed this).

The recruitment and development of the next generation of women research leaders is further supported by our IPH infrastructure:

- **IPH Leadership and Mentoring Lead** (Woolfall)
- **Aurora Women in Leadership Programme** (3 UoA2 participants)
- **Springboard Programme** (5 UoA2 participants).

## Employment Flexibility and Support

### Staff benefits – a family friendly guide

11

The Institute of Psychology, Health and Society recognises that many staff and students have important family responsibilities outside work, such as caring for children and elderly relatives. We offer a flexible and supportive work environment and hope you will find this fact sheet helpful as a pointer towards the many family-friendly initiatives available to you. Further details can be found at [www.liv.ac.uk/working/whyworkhere/familyfriendly/](http://www.liv.ac.uk/working/whyworkhere/familyfriendly/)

#### Maternity Leave



A female member of staff, regardless of length of service, is entitled to take Maternity Leave for the birth of each child. The University has a generous maternity leave scheme, available to all women who meet criteria.

Contract researchers, including those

#### Compassionate / Domestic / Personal Leave

There may be occasions when staff need to request time off work to deal with domestic emergencies (e.g. a bereavement/serious illness of a close family member or dependant). Although there is no legal requirement for any period of leave to be paid, all staff

Since 2014, IPH has developed a Family Friendly Guide, given to all staff during induction (figure). All staff can now access a range of family friendly options ( maternity, paternity, adoption and shared parental leave; Keeping-in-Touch days; compassionate, domestic and personal leave). The University's flexible working policy empowers individuals to vary or adjust their pattern of work based on their personal circumstances, including working from home. Since 2014, 100% of change of work pattern requests from IPH staff have been approved.

Family Friendly Advisors (10 in FHLS) and support networks including the Carer's Network, Parent's Network and ECR Network provide information, guidance and mentoring for staff. Staff and students can also access a milk expression room.

Our Institute covers the costs of maternity/paternity leave for postdoctoral and fixed-term contract staff, and our return-to-work rate after maternity leave is 100%. Around 1/5 staff then choose a reduced hours contract. We also organise free childcare for open days and conferences.

### Campus Accessibility

The Waterhouse Building, housing most UoA2 staff, is fully accessible. The University estates management policy on accessibility is embedded in all planning and construction. Our **disability access guides** to campus highlight accessible toilets, accessible parking spaces and accessible easy routes. Our Computer Services Department also provides a wide range of accessibility software and hardware for staff and students with disabilities.

### Wellbeing

**University Wellbeing Week** is organised annually with activities for staff and students including sports, meditation and craft sessions. Staff can use three days of 'Liv to Give' leave annually to volunteer for charitable causes of their choice.

### Initiatives to support the wellbeing of postgraduate researchers (PGRs) include:

- IPH **PGR Wellbeing Scheme Staff Advocates** (van Ginneken, Thomas), coordinated at a Faculty level by a **Wellbeing Advisor for PGR students** (Kenyani).
- A peer-to-peer **PGR Wellbeing Ambassador scheme**. Ambassadors (five in IPH) complete a range of training modules including Mental Health First Aid and offer signposting support and run wellbeing events.
- Our **Buddy System** links new PGR students with a 2nd or 3rd year PhD student.
- Highlighting the **UoL Report and Support Tool** for reporting harassment or bullying.
- An **online training module for supervisors** on how to support student mental health and wellbeing (launched 2019).

- Comprehensive **PGR student induction** includes signposting to University wellbeing services, disability support, student societies, faith organisations, and the LGBT network.

**To support IPH staff:**

- The **Employee Assistance Programme (EAP)** - a confidential counselling and information service to assist with personal or work-related problems.
- A trained **Mental Health First Aider** (van Ginneken) and **Wellbeing Lead** (Day).

*EDI in REF Processes*

We have ensured that EDI considerations transparently underpin all our REF processes including:

- **Mandatory EDI and bias training** for all,
- Incorporating the **University's REF Code of Practice** into every stage of our UoA2 submission,
- Ensuring diversity of the UoA2 team,
- Involving ECRs and all staff in scoring outputs,
- Continuous monitoring for any bias in proposed returns, and
- Feedback to staff.



### 3. Income, infrastructure and facilities

#### 3A. Research Income

##### Overview

Our Unit's third strategic priority is '**to develop a diverse and sustainable funding base, with growth in awards to develop our infrastructure and resources**'.

During this REF period, our average annual grant expenditure per eligible FTE has substantially increased by 36%, from £153K in REF2014 to £208K now.

We have thus built a large portfolio of new awards totaling £53M (up from £47M in REF2014) including:

- UK Government / NIHR **£38.3M** (up 68% from £22.8M income in REF2014)
- RCUK **£6.5M** (up 94% from £3.4M)
- UK Charities **£3.4M** (up 20% from £2.9M)
- EU and international funding agencies **£4.6M** (up 40% from £3.3M in REF2014)

##### Major and Prestigious Grant Awards

Notable grants exceeding £500k awarded to UoL during the REF period are summarised below:

FUNDER & Project Title	Senior Investigator	UoL Total	Grant Total
<i>Production of Technology Assessment Reviews (TARs) for the NIHR</i>	Boland	£5.6M	£5.6M
<i>ARC North West Coast</i>	Gabbay	£3.5M	£9M
<i>RETURN: Interventions to reduce inequalities in the uptake of routine dental care</i>	Harris	£2.2M	£2.4M
<i>NIHR Gastrointestinal Health Protection Research Unit</i>	Barr	£1.5M	£4.6M
<i>ISDR: Introducing personalised risk-based intervals in screening for diabetic retinopathy</i>	Byrne, Garcia-Finana, Williamson, Gabbay	£1.3M	£2.1M
<i>CLEAN-AIR(Africa): NIHR Clean Energy Access for the prevention of Non-communicable disease in Africa</i>	Pope	£1.3M	£1.9M
<i>DexEnceph: Dexamethasone in Herpes Simplex Virus Encephalitis Randomised Controlled Trial.</i>	Williamson	£1.1M	£1.1M
<i>RDS: Research Design Service for North West England</i>	Gabbay	£1M	£4.9M
<i>CASTLE: Changing Agendas on Sleep, Treatment and Learning in Childhood Epilepsy</i>	Tudur-Smith	£1M	£2.3M
<i>COPE: The Carboprost or Oxytocin Postpartum haemorrhage Effectiveness Study</i>	Gamble	£1M	£1.8M
<i>Phase IIb, randomised, double-blind, placebo-controlled, multi-centre trial of infliximab with</i>	Williamson	£1M	£1.6M

## Unit-level environment template (REF5b)

<i>transcriptomic biomarker &amp; mechanism evaluation.</i>			
<i>CF-START: Cystic Fibrosis Anti-Staphylococcal Antibiotic Prophylaxis Trial</i>	Williamson	£1M	£1.5M
<i>North West Research Design Services (Phase 2).</i>	Gabbay	£0.9M	£3.7M
<i>SAVER - Sodium valproate for epigenetic reprogramming in the management of high-risk oral epithelial dysplasia</i>	Young	£0.9M	£1.1M
<i>BESS: Bronchiolitis Endotracheal Surfactant Study - Efficacy and mechanism of surfactant therapy in infants with life threatening Bronchiolitis:</i>	Woolfall	£0.8M	£1.7M
<i>LiLaC 2: Liverpool and Lancaster Universities Collaboration for Public Health Research</i>	Whitehead	£0.8M	£1.6M
<i>ROAM: Radiation versus observation following surgical resection of Atypical Meningioma: a randomised controlled trial</i>	Gamble	£0.8M	£1.4M
<i>AZTEC: AZithromycin ThERapy for Chronic lung disease A randomised, placebo controlled trial of azithromycin for the prevention of chronic lung disease of prematurity in preterm infants</i>	Gamble	£0.7M	£2.1M
<i>DREAM: A RCT Desensitisation to cow's milk, in children with Allergy to cow's Milk</i>	Williamson	£0.7M	£1.6M
<i>FEMUR III: A multi-centre RCT and economic evaluation of a community-based rehabilitation package following hip fracture</i>	Williams	£0.6M	£2.3M
<i>PREVAIL-Preventing infection using antibiotic impregnated long lines</i>	Gamble	£0.6M	£1.9M
<i>TEMPEST: Randomised, double-blind, placebo-controlled, phase 2 evaluation of the efficacy and mechanism of trientine in patients with hypertrophic cardiomyopathy</i>	Dodd	£0.6M	£1.9M
<i>WorkHORSE: Health Outcomes Research Simulation Environment</i>	O'Flaherty	£0.6M	£0.6M
<i>Civic Data Co-Operative</i>	Buchan	£4.7M	£5.3M
<i>Health North, Connected Health Cities</i>	Bodger	£1M	£4.7M
<i>Treating common mental disorders in Congolese refugees in Uganda and Rwanda:</i>	Hill	£0.6M	£1M
<i>Development of New Mathematical Sciences Capabilities for Healthcare Technologies</i>	Williamson	£1.8M	£2M
<i>RenalToolBox: Developing novel tools and technologies to assess the safety and efficacy of cell-based regenerative medicine therapies, focusing on kidney disease</i>	Garcia-Finana	£1M	£4.5M
<i>PIDS: Population level Interventions to improve diet and reduce Social inequality</i>	Capewell	£1.2M	£1.2M
<i>HERC: Health e-Research Centre</i>	Buchan, Capewell,	£4.8M	£4.8M

	Williamson		
<i>North West Hub for Trials Methodology Research</i>	Williamson	£1.3M	£1.6M
<i>Tackling inequalities in child health: Harnessing data to improve lives.</i>	Taylor-Robinson	£0.9M	£0.9M
<i>TRIM: Development of a novel blood test to aid the diagnosis of bacterial meningitis</i>	Garcia-Finana, Byrne	£0.8M	£0.8M
<i>Brain architecture and function at epilepsy diagnosis: markers of pharmaco-resistance and cognitive dysfunction</i>	Garcia-Finana	£0.6M	£0.8M
<i>TOPS: Timing of Primary Surgery for Cleft Palate</i>	Williamson	£1.2M	£7.1M
<i>C-GULL: Children Growing up in Liverpool Birth Cohort and CityLab Linked Data</i>	Taylor-Robinson, Williamson	£4.7M	£5.2M

Figure 7: Grants exceeding £500k awarded to UoL during the REF period

**Externally-funded personal awards for outstanding researchers** totalled £2M in the REF period, increasing from £1.5M in REF 2014:

Funder	Scheme	Academics	Total value
<b>Medical Research Council (MRC)</b>	Clinician Scientist	Taylor-Robinson	£900k
	Clinical Research Training Fellowship	McHale	£205k
<b>Wellcome Trust</b>	Society & Ethics Fellowship	Wickham	£211k
<b>NIHR</b>	Senior Investigator	Buchan, Dowrick, Williamson	£500k
	Post-Doctoral Fellowship	Bonnett	£180k

Figure 8: Externally-funded personal awards

### Realising high quality outputs and impacts from grants

Our research funding has enabled us to produce highly cited and impactful papers.

For example: Taylor-Robinson 'Austerity, sanctions, and the rise of food banks in the UK', *BMJ Online*, 2015, has been cited 130 times with a Field-Weighted Citation Impact of 16.5 and an Altmetric score of 1,594, (within the top 5% of all research outputs scored by Altmetrics);

*The COMET Handbook: Version 1.0; Trials*, 2017, has been cited 400 times, with a Field-Weighted Citation Impact of 24.5.

### Strategies for Generating Income

**People:** We have invested in staff recruitment to build critical mass, expertise and sustainability in our three research groups. We have gained 27 new academic members of staff since 2014 (see Section 2). Buchan and Rodgers's academic leadership in health data science has secured over £20M research income since 2018.

**Pump priming funds:** In 2016, the University was awarded a third **Wellcome Trust Institutional Strategic Support Fund (ISSF)** award, (£2.5M over 5 years). This provides seed-corn research funding for newly-appointed ECRs. For instance, having received a total of £58K ISSF support,

two ECRs have then independently won substantial external grant funding from prestigious schemes, including **NIHR Health Technology Assessment** (Woolfall, £616K) and the **MRC Health Systems Research Initiative** (Brooks, £32K). Both were subsequently promoted to Senior Lecturer in 2019. (Section 4A summarises our other seed funding schemes).

**Strengthening proposals:** Our **extensive peer-review** process starts with informal discussion with university mentors sharing experience of relevant funders and schemes (e.g. the University's ESRC review panel) progressing to peer-review panels of senior staff providing mock interviews and constructive feedback applicants.

The University's **Research and Partnerships Development Team** provide additional support for major grant applications (managing complex bids, arranging peer review, arranging and conducting mock interviews). For instance, they contributed to the successful C-GULL and ARC NWC bids winning a total of £14M.

**Leveraging additional funding:** Each of our substantial recent awards, (including ARC NWC, C-GULL, HDR UK and MRC/NIHR TMRP and CDC), brings major opportunities for catalysing further related research and grants. For instance, previous birth cohorts have successfully leveraged funding for add-on studies at many times the value of the original grant award. This represents a further, new opportunity for UoA2 as the rich C-GULL and CDC data become available.

### 3B. Infrastructure and Facilities

**Our substantial investments since 2014 have exceeded £20M**, including:

- £2.5M Waterhouse Building refurbishment, creating new office space allowing co-location of UoA2 staff.
- £1M Farr Institute wing refurbishment (part-funded by MRC).
- £10M data centre for large-scale data storage and computational analysis.
- £7M Sherrington Building refurbishment to provide a modern hub for teaching and research.

#### *Joint Research Service with NHS Partners*

Our University is a founding member of **Liverpool Health Partners (LHP)**. This consortium includes our local NHS Trusts, CCGs and Universities (Figure 10, see section 4B). LHP facilitates clinical research collaborations across academic and clinical settings, rapidly translating research outputs into clinical benefits for patients. The **SPARK (Single Point of Access for Research & Knowledge)** service co-locates Research and Development teams from all LHP members to provide seamless administration for clinical research. **Buchan** is director of Digital Health for LHP.

#### *Creating the new Liverpool Clinical Trials Centre (LCTC)*

Up to 2018, University of Liverpool had two outstanding clinical trials units (CTUs) - the Liverpool Cancer Trials Unit (**LCTU**) and Clinical Trials Research Centre (**CTRC**). They were the only North West CTUs to be awarded and sustain full UKCRC Registration in recognition of their sustainable infrastructure and strong track record in delivering high-quality clinical research as judged by an international panel. Following an external review, the two units were merged in 2019 to form the single, fully integrated **Liverpool Clinical Trials Centre (LCTC)**, bringing together 120 clinical research staff to provide world-class governance and support of clinical trials (Director: Gamble). This merger was underpinned by core investment from the University, plus very substantial NIHR CTU infrastructure funding, generating around £7M annually.

*Trials Methodology Research*

The Liverpool-led **MRC North West Hub for Trials Methodology Research** has received over £2M MRC investment (2014-18). Liverpool also set up and leads the broader **MRC-NIHR Trials Methodology Research Partnership** (£460k). This interdisciplinary research collaborative aims to facilitate and accelerate the translational process, through the development of new and improved approaches for the design, conduct and analysis of clinical trials. Key achievements include the COMET initiative (see Section 4E), six funded PhD studentships in Liverpool, and two postdoctoral posts in trials methodology.

*Evidence Synthesis Expertise*

**Liverpool Reviews and Implementation Group (LRiG)** sits at the heart of evidence informed decision-making for the NICE technology appraisal programmes. Since 2014, LRiG has provided evidence reviews underpinning over 20 national guidance projects, produced 15 NIHR monographs, published 12 Cochrane reviews and won NIHR Technology Assessment Reviews grants to support 10 staff to pursue higher degrees. In 2016, the University funded an **Academic Lecturer in Evidence Synthesis** to further extend capacity.

*Research Design Service NW (RDS NW)*

Embedded in UoA2, RDS NW was renewed in 2018, with £5.5M funding from NIHR (Gabbay, Frith, Williamson, Young). This provides much-valued research methodology support and advice across the Unit and beyond.

*Computer Services and Informatics Facilities*

The University has recently invested £10M in a new primary state-of-the-art **campus data centre**, providing centrally-managed space to house project-specific hardware and work closely with Net NorthWest. Our researchers have free access to the **High Throughput Computing service** (HTC), and **High-Performance Computing (HPC)** capabilities via a central computing cluster.

Our established strategic computing partnerships include:

- The **Bede** flagship supercomputer is specifically designed around solving digital health challenges. Echoing the world's fastest systems, Bede will be the UK's first supercomputer to improve AI inference.
- The **STFC-funded Hartree Centre** gives researchers excellent access to petascale HPC, HTC, hyperscale storage, data analytics clusters (rested, streaming and predictive), cognitive computing platforms, software development expertise and visualisation suites.
- The **N8 Computationally Intensive Research Digital Health Lead group** gives access to advanced infrastructure, training courses and software tools (including *Python for Web Scraping for Digital Health*, and an *Introduction to Reproducible Analyses in R*).

Our recently appointed, inaugural **Head of Research Computing** for FHLS is building a Faculty-wide Research Computing strategy, investment plan and service delivery roadmap to enhance future provision and further expand our **data science** capabilities.

*Benefits in-Kind*

The NIHR CLAHRC and ARC NWC have provided £11M in benefits in kind. This funding represents the collaborative research resources spent by NHS and local authority partners co-producing research and implementing the findings as part of the CLAHRC and ARC programmes.



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

##### 4A. Collaboration

**We work in partnership with numerous governmental and non-governmental organisations locally, nationally and internationally.**

As a civic University in one of the UK's most deprived regions, local collaboration is a top priority for delivering research, creating impact, and serving our local communities.

Locally, we work with **Liverpool Health Partners (LHP)** to develop our regional partnerships including NHS Trusts, CCGs, and HEIs (Figure 9). Nationally with DHSC and Public Health England. We also work with a wide range of UK and international HEIs, and industry partners such as GlaxoSmithKline. Furthermore, many of our researchers are members of the NIHR School for Public Health Research (SPHR) and the Public Health Research Consortium (PHRC).



*Figure 9: Map of Liverpool Health Partners (LHP) members*

Our international partnerships include WHO, EU, LMIC government ministries of health and energy (Cameroon, Malawi and Liberia); professional organisations (e.g. American Heart Association, European Society of Human Reproduction and Embryology), and international NGOs (e.g. La Isla Network, Global LPG Partnership).

We increased our international collaborations throughout the REF period. Outputs involving an international collaborator rose from 36% in 2014 to 47% in 2020. The reach of our international collaborative research is now substantial, as demonstrated by a Field-Weighted Citation Impact of 4.30 for papers with international co-authors (Figure 10).



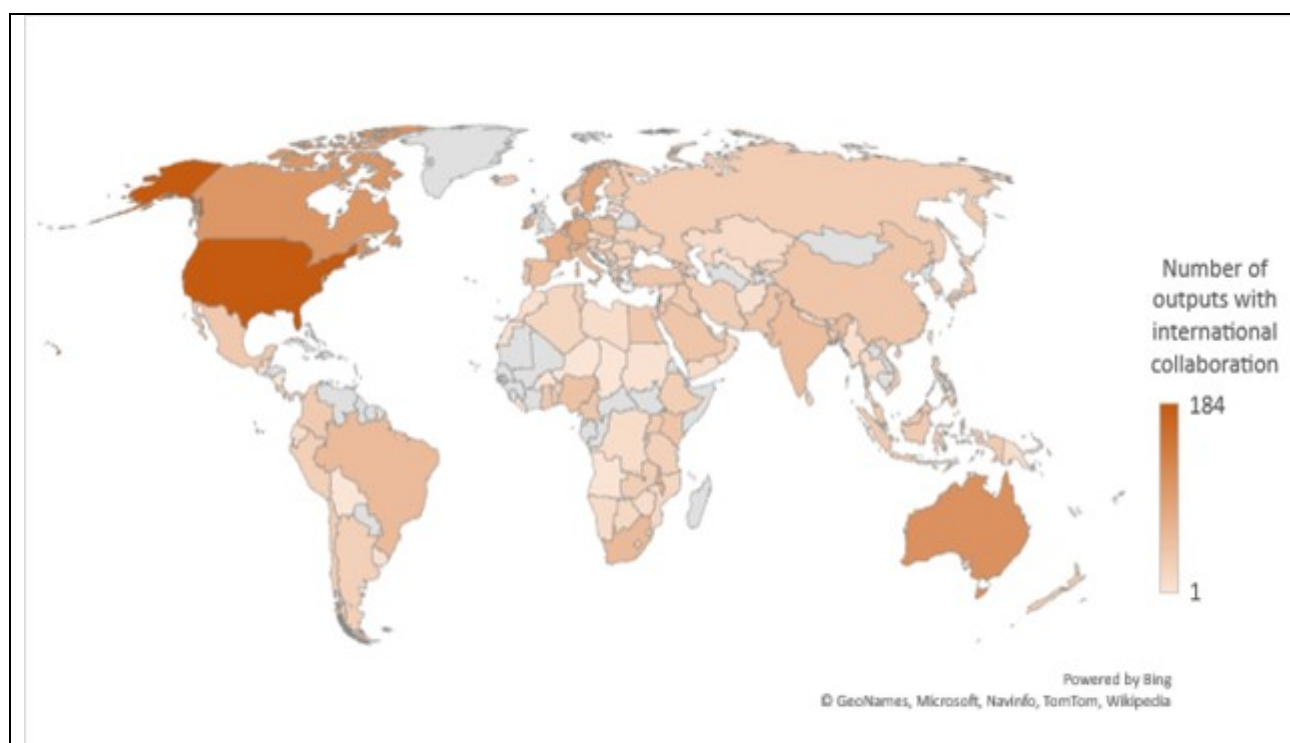


Figure 10: Outputs since 2014 involving co-authors in international collaborations.

#### University Support for Collaboration

The University's **Research, Partnerships and Innovation Directorate** supports and manages collaborative relationships with strategic partners, advises on financial and contractual issues and facilitates impact and knowledge exchange.

There are University funding schemes to support collaborations:

- **Translational Research Access Programme Fund** fosters new interdisciplinary collaborations to advance translational research. UoA2 academics have been involved in three funded projects, winning a total of £290k, including a new collaboration with UoA1 entitled '*Electronic health record data for improving outcomes in cardiovascular diseases*' (Fleming, 2019).
- **Wellcome Trust Institutional Strategic Support Fund** UoA2 teams have received £40,000 to grow collaborations (see section 3A.3).
- **The Hugh Greenwood Legacy Fund** supports collaborative child health projects with Alder Hey Children's Hospital. Gladstone awarded £60,000 for a feasibility study to support parents of babies at high risk of cerebral palsy.
- **Public Policy QR Strategic Priorities Fund** (launched 2019) funds collaborative research that supports evidence-based policy making. Barr secured a £19,000 statistical and computing methods award which enabled collaboration with Liverpool CCG on interventions for at-risk populations.
- **Overseas Development Assistance (ODA) Research Seed Fund** (From 2016): This provides up to £10,000 pump priming grants for research with Low-and-Middle-Income Country partners, relationship-building through travel and pilot studies, and enhancing subsequent applications to external ODA funding schemes. In 2020, £12,000 was awarded to Pope and Giebel to support COVID-19 projects in Cameroon and Uganda respectively.

**These pump-priming schemes have led to several large UoA2 collaborative awards:**

**Seed Funding Case-Study: Prof Melissa Gladstone** secured £10k from the **ODA Research Seed Fund** for a feasibility study on interventions to support at-risk neonates. That led to winning a £200,000 MRC Mental Health grant with the College of Medicine in Malawi. This also contributed to our Impact Case Study (see section 1E).



**Seed Funding Case-Study: Prof Daniel Pope** secured £2,000 in 2015 from the **ODA Research Seed Fund** for overseas travel to build partnerships, and £6,000 in 2016 from the **Knowledge Exchange and Impact Voucher Scheme** on 'Implementing the WHO Air Quality Guidelines for Household Air Pollution'. This scoping work led to two Cameroon studies (£0.5M, CDC & NIH), and the CLEAN-Air (Africa) Global Health Group (£2.5M, NIHR, 2018-22) grants built on the network he has grown across Africa. Pope was awarded a personal Chair in 2018 and he is now applying for an NIHR Global Health Unit.

**4B. Longstanding Collaborations and Policy Engagement**

Our research informs policy and public health practice by engaging with policy environments at all levels from local to global - ***delivering the right evidence in the right place at the right time to change practice and promote public health.***

Working with nine **local authorities** and **Liverpool City Region Combined Authority**, we can shape city and regional public health policy. We have partnerships with local SMEs specialising in web and mobile application development and clinical data science related services, including Citrus Suite (mobile health technology), and AIMES (secure storage and analyses of sensitive NHS and Social Care datasets). Our large collaborative awards and successes built on local partnerships include ARC NWC, C-GULL, and the CDC (see section 1D).

**Our extensive civic and regional policy engagement since 2014 includes:**

- Membership of Liverpool Health and Wellbeing Board (Taylor-Robinson, Barr; 2019-current); Children's Trust Board (Taylor-Robinson)
- Liverpool as a UNICEF Child Friendly City Steering group (Taylor-Robinson)
- Citywide Strategy Group for Fairness and Tackling Poverty (Taylor-Robinson)
- Cheshire and Merseyside Directors of Public Health (CHAMPS) resource allocation in LAs (Barr, Taylor-Robinson, Whitehead)
- Advising Liverpool City Region, Lancashire councils and the Northern Health Science Alliance on maximising the health equity impact of economic strategy (Barr, Wickham)

*National Research Collaborations since 2014*

Our UK partnerships are facilitated by NIHR collaborative structures, and the **N8** collaboration between eight northern research-intensive Universities. These include:

- **MRC/NIHR Trials Methodology Research Partnership** (See Section 3B)
- **LiLaC** (*The Liverpool and Lancaster Universities Collaboration for Public Health Research*) is one of 8 institutional members of the **NIHR School of Public Health Research**. LiLaC's mission is to produce evidence on effective actions addressing the upstream causes of health inequalities.
- One of six members of the **NIHR Public Health Policy Research Unit**: a collaboration conducting research of relevance to the DHSC (funded by the NIHR Policy Research Programme 2010-19, and 2019-2024).
- The Health Foundation's **Networked Data Lab** - a network of UK teams working together on key issues in health and care using linked datasets.
- **HDR UK** spans academia, healthcare, industry, charities, plus patients and the public, working together to develop and apply cutting-edge approaches to clinical, biological, genomic and other multi-dimensional health data to address the most pressing health needs.
- Through **MRC HTMR, MRC-NIHR TMRP and COMET** we collaborate with major national organisations (Health Data Research UK, ABPI, UKCRC CTU Network, NICE) and international organisations (The Global Health Network, Society for Clinical Trials (US), ECRIN (Europe), HRB TMRN (Ireland), and CDISC (US)).
- Our **Trials & Methodology group** is the hub for statistical support to multiple Cochrane Collaborative Review Groups (Epilepsy, Infectious Diseases, Cystic Fibrosis, Pregnancy and Childbirth, and Neuromuscular Diseases).

*National Policy Engagement since 2014*

- **DHSC Technical Advisory Group (TAG)** of the Advisory Committee on Resource Allocation for the NHS (Whitehead, Barr);
- **PHE Health Inequalities Board** (Whitehead);
- **Parliamentary Select Committees** and **All-Party Parliamentary Groups** oral evidence (Barr, Capewell, Pennington, Taylor-Robinson, Whitehead, Wickham);
- **Royal College of Paediatrics and Child Health** committees (Taylor-Robinson);
- **DHSC/DWP Joint Work and Health Unit** workshops and consultations (Barr, McHale, Whitehead);
- **Cabinet Office** consultations on work and disability (Whitehead);
- **Northern Health Science Alliance** and **N8** (Wickham, Barr, Taylor-Robinson);
- **Clinical Priorities Advisory Group**, NHS England (Frith);
- **Royal College of Physicians Ethics Committee** (Frith);
- **Secretary of State for Transport's Honorary Medical Advisory Panel on Driving and Disorders of the Nervous System** (Tudur-Smith).

*International Collaborations since 2014*

- **WHO**: Collaborating Centre for Policy Research on Determinants of Health Equity - <https://www.liverpool.ac.uk/population-health-sciences/departments/public-health-and-policy/research-themes/who/> (Directors: Whitehead, Barr, Pope).

- **Kenyan Ministry of Health:** We partner this Universal Health Coverage initiative to train 130,000 community health workers across Kenya in 2021 using our new training manual on health, prevention and household air pollution (Pope).
- **COMET** (Core Outcome Measures in Effectiveness Trials) (see section 4D below).
- **WHO: Liverpool Reviews and Implementation Group** has ongoing collaborations (since 2018) on global food advertising policies and indoor pollution in LMICs.

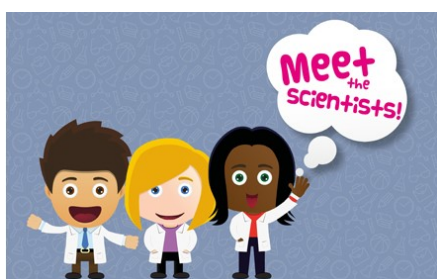
#### *International policy engagement since 2014*

- **Scientific Advisory Group (SAGE)** WHO EURO Health Equity Status Report (Chair: Whitehead; Lead researcher: Barr);
- **WHO** global technical guidelines committees (Taylor-Robinson, Pope, Dowrick);
- **International Network for Research on Inequalities in Child Health** (Taylor-Robinson, Wickham).

#### 4C. Wider engagement with diverse communities and the public

##### *Public Engagement*

Our vibrant outreach programmes are co-ordinated through our research groups and supported by the **Faculty Public Engagement Grant Scheme** and **Public Engagement training events** for staff and students.



Activities since 2014 have included six **Pint of Science** and **Science in the Café** events (Frith, Perry, Bonnett). Held in local pubs and cafes, these scientific presentations and discussions showcase and build engagement with University researchers. Four family-friendly **Meet the Scientist** events in the Liverpool World Museum have presented research in fun, accessible ways to stimulate children's interest in STEM (Harris, Bonnett). Our **Public Engagement Mentoring**

**Scheme** supports ECRs to gain confidence in this public engagement work (Bonnett).

##### *Public and patient involvement (PPI)*

**All our work is informed by robust PPI, underpinned by a dedicated PPI Committee.**

Furthermore, we are leaders in developing methodological expertise in PPI (Woolfall, Young, Williamson, Frith), notably:

- The **PIRRIST study** (2015) to enhance Recruitment and Retention in Surgical Trials subsequently informed national approaches and generated **UK guidance on best practice in PPI**. (Woolfall).
- **METHODICAL Study** for Patient and Public Involvement in Clinical Trials <https://bit.ly/3mGI3WZ> (MRC funded, PI Woolfall). This involved key stakeholder groups and identified 16 priority topics for future research.
- **COMET's** People and Patient Participation, Involvement and Engagement (**PoPPiE**) Working Group supports meaningful patient involvement in every Core Outcome Set, and has dramatically increased patient participation in outcome-setting from 15% to 93% <http://www.comet-initiative.org/Patients>



**PPI Case Study: Neighbourhoods for Learning (Nsfl)**

In collaboration with 9 Local Authorities, Barr established **Nsfl** in 10 deprived areas. Over 70 residents worked as equal partners, identifying priorities for action, co-developing and implementing solutions to improve neighbourhood system resilience, evaluating impacts, and co-authoring 14 academic papers with ARC-NWC/CLAHRC researchers. Other outputs include films, drama workshops, art events and community gardens. A key WHO report cited Nsfl as an '**inspirational example**' of creating resilient communities.

**4D. Contributions to the Economy and Society since 2014**

These extensive collaborations and policy engagements have enabled us to deliver significant impacts locally, nationally and internationally.

Locally, the **Inquiry into Health Equity for the North of England - Due North** programme of knowledge translation (Chair: Whitehead, evidence papers: Barr, Taylor-Robinson) led to protection of investment in local children's services, and Liverpool joining the **UNICEF child friendly cities** programme. Our data-driven **policy modelling tools** embedded in local civic health systems, (including the [Place Based Longitudinal Data Resource](#), [Rapid Intervention Causal Evaluation \(RICE\) tool](#) and our *WorkHORSE* Health Outcomes Research Simulation Environment) support Local Authorities and CCGs across the North West in the rapid identification, evaluation, and implementation of effective public health interventions (Barr, O'Flaherty, Taylor-Robinson).

Nationally, our work has led to **changes in NHS resource allocation policy** (an additional £1billion going to more disadvantaged areas). Our evaluations of major welfare reforms (Work Capability Assessments, Universal credit and child poverty alleviation) have informed debates in Parliament, the Work and Pensions select committee, all-party parliamentary groups and Chief Medical Officer roundtable events, subsequently leading to changes in **national welfare policy**.

Internationally, our work demonstrating the devastating health consequences of indoor air pollution has led to the development and implementation of **WHO Indoor Air Quality Guidelines** (Pope, Bruce). We have also demonstrated that population-wide **food and tobacco control policies** are powerful, rapid, equitable and cost-saving (using innovative modelling techniques, empirical evidence and policy analysis - Capewell, O'Flaherty, Kyridemos). This evidence has informed guidance from Public Health England, NICE, the Department of Health, and WHO, leading to health promoting public policies on salt, sugar and trans fats. Our WHO Collaborating Centre Policy Research on Health Equity (Whitehead, Barr) powerfully informed the **WHO Europe Health Equity status report** recommendations, subsequently endorsed by the 93rd Regional Assembly.

Our **impactful clinical trials** include a portfolio of trials in infection (CATCH: Gamble, Woolfall; PREVAIL: Gamble; BASICS: Gamble) and in children with epilepsy emergencies (EcLiPSE – Woolfall, Gamble) or severe uveitis (SYCAMORE: Williamson).

Our £1.6M **consultancy income** since 2014 reflects collaborations with over 80 organisations (including Astra Zeneca, European Brain Council, FujiFilm, GSK, Global LPG Partnership, Mondelez, Proctor & Gamble, UNICEF, and Unilever).

Our interdisciplinary impact is evidenced by two additional REF Impact Case Studies submitted in other UoAs: Williamson's on COMET (UoA10 Mathematical Sciences), and Frith's on information giving in fertility treatment using egg and sperm donors (UoA30 Philosophy).

### ***Responding to National and International Priorities: COVID-19 Research***



Our recent interdisciplinary research addressing the challenges of the COVID-19 pandemic has been rapid and strong

<https://www.liverpool.ac.uk/coronavirus/research-and-analysis/>

UoA2 secured funding including:

- **LHP Consortium Strategic Research Fund** supporting a series of social science studies into behavioural responses to COVID-19 (Gabbay, Frith, Young, Kierans)
- **UKRI Covid Award** on ethical allocation of care for non-Covid patients (Frith)

We have provided **expert input at national policy level** via Collins (COVID-19 modelling for Welsh Government; SAGE papers on Non-Pharmaceutical Interventions) and Barr (SAGE Inequalities Subgroup).

We established **CIPHA**, the world's first Civic Data Cooperative and Analyst network (Buchan). Embedded in the Cheshire & Merseyside Integrated Care System, this provides near real-time intelligence across NHS, local authority and public health data.

### 4E. Contributions to research disciplines since 2014

#### *Developing guidelines and resources for researchers*

- **COMET** (Core Outcome Measures in Effectiveness Trials) has established **international standards for harmonising outcomes across clinical trials**. COMET has led to key policy and societal impacts, endorsed by NICE, the Health Research Authority, the pharmaceutical industry and government funders in the UK, US, Belgium, Germany and Ireland (<http://www.comet-initiative.org/COSEndorsement>).
- **Liverpool Clinical Trials Centre** (Section 3.B) as an established track record in delivering high quality clinical trials, **advances in methodology** and supporting the UKCRC network.
- **IBD-Control Questionnaire** (Bodger): a patient-reported outcome measure endorsed internationally by ICHOM and widely used in UK / European Inflammatory Bowel Disease registries (IBDREAM, Netherlands) and clinical studies (e.g., PREdiCCt, NIHR Bioresource, VEST, Takeda)



- **CONNECT** is the first study to explore family and clinician perspectives on research without prior consent in emergency situations. CONNECT guidance has now informed the design of eight clinical studies and has been included in an NIHR Clinical Trials Toolkit and HRA resources.

#### *Training and Capacity Building, including Interdisciplinarity*

Our **MRC Skills Development Fellowship** postdoctoral scheme for quantitative early-career training (<http://liverpoolmrscsf.uk/>, >£1M, lead Williamson) funds seven fellows in a unique interdisciplinary programme which combines mathematical science, computer science and biostatistics. Williamson and Tudur-Smith also oversee a cohort of 20 MRC-funded PhD students in the **HTMR Network**, plus a cohort of 30 PhD students in the new **MRC-NIHR TMRP** doctoral training programme.

Our university-wide **Doctoral Training Network in Artificial Intelligence (AI) for Future Digital Care** is developing and applying AI solutions to health and well-being (Garcia-Finana).

Our University-funded, interdisciplinary, **Centre for Humanities and Social Sciences of Health, Medicine and Technology** (Director Kierans) brings together public engagement with critical scholarship to enhance understandings of medical, scientific and technical practice.

#### 4F. Indicators of wider influence

Empowered by substantial collaborations, grants, outputs and impacts, our academics enjoy wide national and international influence as committee chairs/members, reviewers, fellows, speakers and prize-winners.

Surveying our Category A staff in 2019/20:

- 48% have engaged with policymaking bodies,
- 40% have engaged with industry through research or advisory capacities,
- 33% have served on a Government advisory board, or as a parliamentary expert,
- 75% have served on professional bodies or learned societies,
- 40% have served on national or international grants committees,
- 40% have served on journal editorial boards, and
- 64% have participated in conference organization.

#### *International Visiting Professor roles*

- Dowrick – University of Melbourne,
- Frith – University of Hong Kong,
- Higham - Yonsei University College of Dentistry, Seoul, S. Korea,
- Taylor-Robinson – University of Copenhagen,
- Whitehead – Karolinska Institute.

#### *Learned Societies, Prestigious Research Bodies and Health Organisations*

- Capewell – **President**, UK Society for Social Medicine (2015 & 2016); **Vice President**, UK Faculty of Public Health (2015-2018).
- Higham - **President** of the Cariology Group of the International Association for Dental Research 2019-21.
- Whitehead – Advising UN Special Rapporteur on the Right to Health. Member of Council of the Academy of Medical Sciences (2020-2023)

*Prestigious Awards and Prizes*

- Bonnett - **Rosalind Franklin Award Lecturer** for physical and mathematical sciences, British Science Festival, 2018; **Twenty in Data & Technology, Women in Data**, 2019.
- Dowrick - **George Abercrombie Award** for special meritorious literary work in general practice, 2017; **Commissioner** for Lancet/World Psychiatric Association Commission on Depression (2018-2020); **WONCA Fellowship** (2020).
- Harris - **Giddon Award for Distinguished Research** in the Behavioural Sciences, (International Association for Dental Research, 2014).
- Williamson - **Bradford Hill Lecturer**, 2017; **Cochrane-REWARD prize**, 2017 (for COMET); Elected to the **Academy of Medical Sciences**, 2018.
- Williamson and Gamble - **Cochrane Collaboration Bill Silverman prize**, 2017.
- Whitehead - **Damehood (DBE)** 2016 for services to Public Health and health inequalities research; **Alwyn Smith Prize 2018**, UK Faculty of Public Health, for 'the most outstanding contribution to the health of the public'; and **RCP "Women in Medicine"** celebratory exhibition 2018: one of the 26 "most influential women in medicine" today (see Case study below).



**Wider Influence Case-Study: Dr Laura Bonnett**, TTF in Medical Statistics, works on the development of clinical prediction models for people with chronic conditions, and has informed DVLA's regulations around epileptic seizures. Bonnett was recognised as one of Women in Data's 2019 **Twenty in Data & Technology**, was awarded the British Science Association's **Rosalind Franklin Award Lecture**, 2018 and was named as the Royal Statistical Society's **William Guy Lecturer**, 2020.



**Wider Influence Case-Study: Prof Dame Margaret Whitehead**, W.H. Duncan Chair of Public Health. An internationally renowned authority on health inequality, she was awarded a **Damehood (DBE)** in 2016 for her long-standing contribution to the understanding of health inequalities. She received the UK Faculty of Public Health's **Alwyn Smith Prize 2018** for 'the most outstanding contribution to the health of the public'; also recognised as one of the **Royal College of Physicians'** "most influential women in medicine today".