

<p>Institution: University of Essex</p>
<p>Unit of Assessment: 2 – Public Health, Health Services and Primary Care</p>
<p>1. Unit context and structure, research and impact strategy</p> <p>1.1 Context</p> <p>Our vision is to establish the University of Essex as a distinctive centre for research in public health in line with the University's singular mission to deliver excellence in research.</p> <p>This is the first time that the University of Essex has submitted to the UoA2 subpanel. The submission emerged from an institutional review carried out following the last REF cycle, which identified public health as a distinctive area of excellence with potential for investment and expansion. Capitalising on expertise in social and health inequalities, the unit has developed new and exciting areas that combine this research, particularly with biological science. This 'Biosocial science' is concerned with the dynamic interplay between biology and people's experiences and behaviours over the life course. The overarching aim is to investigate how to better our knowledge and evidence of biological pathways and consequences in order to contribute to our understanding of societal problems and whether this knowledge provides ways of tackling them.</p> <p>The aims of this research unit in the REF period at the University of Essex are as follows:</p> <ol style="list-style-type: none"> a) Co-ordinate the University's existing strength in interdisciplinary research to form a public health group that brings unique insights to the understanding and practice of public health through a unique combination of epidemiology, genomics, the social sciences, and mental health and health services research, together with the development of world-leading research infrastructure and support; b) Expand the group by recruiting research leaders (three professors and one reader) and researchers; and c) Create links and influence institutional bodies responsible for the delivery of effective public health. <p>Our success in delivering a) will be set out in the following sections. However, with regards to b), key to the unique character of this submission was the recruitment of Michaela Benzeval as Professor of Lifecourse Research in 2013, Meena Kumari as Professor of Biological & Social Epidemiology in 2014 and Emily Grundy as director of the world leading Institute for Social and Economic Research in 2017. They combine distinctive records of achievement and leadership in social science, health policy, social epidemiology, genomic science and research infrastructure. Kumari co-ordinated the development and implementation of strategic aims for public health across two faculties, building a research focus in mental health. In particular, as detailed above, she has enabled the unit to focus on the emerging area of biosocial science.</p> <p>With regards to c), as a major part of our approach to impact, the strategy has been to develop enduring links between researchers, service delivery sectors and patient and public involvement so that public health research can best serve the needs of the community, raise awareness of academic public health, its outputs and benefits to the health of the population, through links with practitioners and local services. For example, a strategic partnership was made to capitalise on the move of Public Health England (PHE) to Essex in 2015, and additional partnerships were created with local authority and health providers. This distinctive approach delivers research from all aspect of public health, from biology to society capitalising on the University's strategic investments in data science and social science by inter-unit activity and collaboration.</p> <p>In this REF period, the unit has raised £20M in total research income; published over 350 publications; established a centre of doctoral training in Biosocial Research; become part of the East of England Applied Research consortium (ARC); and enhanced the <i>Understanding Society</i> dataset with biological and COVID-19 data. Of the 13 researchers in this submission, 7.0 FTE are</p>

based in the Institute for Social & Economic Research (ISER), 3.9 FTE in the School of Health and Social Care (HSC) and 1 FTE in the Department of Mathematical Sciences (DMS). It is a small and specialised unit but one that is distinctive in its focus.

1.2. Structure

The work in this unit is divided into the following research clusters:

- **Biosocial Research and Biostatistics** (ISER, DMS)
- **Mental Health and Health Services Research** (HSC, ISER)
- **Research Infrastructure and Support** (ISER, HSC)

The three research clusters sit within a vibrant, creative and productive environment for public health based around these areas. ISER is a world-class team of research and survey experts specialising in the production and analysis of longitudinal data that provides robust evidence of how people's lives are changing over time. In 2017 ISER won the Queen's Anniversary Prize for authoritative research in social and economic research, citing as an example research on long working hours and links to depression in women. Researchers within ISER have fostered links with HSC, which specialises in applied, multidisciplinary research that addresses local, national and international issues relating to health and social care policy and practice. The University has provided substantial research support to develop links across the institution (£431k in this REF period). These included a series of workshops in 2016 funded by the University's Impact Acceleration Account fund and conducted by Kumari to facilitate research overlap and exchange. The workshops have resulted in a number of programmes of research including the submission of grant applications by Kumari (ISER), Ewen Speed and McPherson (HSC) and Booker (ISER) and Green (HSC). Grundy (ISER), Kumari (ISER), Ewen Speed and Green (HSC) contribute to the East of England Applied Research consortium, funded in 2019. There is co-supervision of students across ISER and HSC, to enable doctorate research that benefits expert biostatistical input, alongside applied social science and practice based experience, to open direct pathways to impact. For example, Booker, McPherson and Ewen Speed co-supervise a student, and there is co-supervision of an ARC funded student by Booker and Andrew Bateman (HSC).

In addition, the inter-disciplinary nature of this unit involves collaborations with colleagues in the Institute of Analytics and Data Science (IADS), the School of Life Sciences (SLS), the Department of Psychology, and the Departments of Sociology and Economics. For example, Kumari is the Essex lead of BBSCR/ESRC Centre for Doctoral training 'Soc-B', a Centre for Doctoral training programme in Biosocial Research, which has students that are co-supervised in ISER, SLS and Department of Psychology.

1.3 Research and Impact Strategies

The overarching aims of research and impact activity within UoA2 over this cycle were as follows:

- a) Link expertise in high-quality social science, biology and health to better understand population health and health inequalities.
- b) Embed partnerships with communities, practitioners, policy makers and the public, to ensure knowledge co-creation, dissemination, and translation into policy and practice in mental health and health services research.
- c) Build capacity in public health research in terms of methodological development and key research infrastructure.

Evidence of meeting these objectives:

- **Prestigious publications:** staff have published in world leading venues including Nature journals, with a publication in *Nature Genetics* and *Nature Human Behaviour*, demonstrating the high quality of our interdisciplinary research

- **Attracting research leaders:** We have recruited three professors and one reader during the REF period to provide leadership in biosocial research and mental health nursing.
- **Training the next generation of researchers:** 19 Ph.Ds have been completed during the REF period, contributing and strengthening academic capacity to a cohort of health professionals and researchers
- **Establishing and strengthening ties with local and national public health bodies:** links have been created with Public Health England (memorandum of understanding (MoU)), East Suffolk and North Essex Foundation Trust (MoU), Essex Partnership University NHS Foundation Trust (MoU) and with Essex County Council (Knowledge exchange and placement).

To deliver the overarching research and impact aims we have used the following operational strategies:

Develop health research capacity across the University and at all levels [a] above: Cross-disciplinary activity has been developed using a number of initiatives: recruitment of staff across the University; seed acceleration funds to kickstart collaborations between ISER and HSC; seed acceleration funds to develop regional public health engagement and research (£50k); funding of Soc-B; and support for overarching bids to develop space and infrastructure to collate these organisational activities.

Integrate population health sciences into local collaborative arrangements [b] above: Strategic and working relationships have been strengthened by the development of MoU with PHE and the East Suffolk and North Essex NHS Foundation Trust (ESNEFT). The population health approach to improving health and well-being adopted by researchers in the unit led to the incorporation of the University of Essex into the NIHR East of England Applied Research consortium in 2018.

Increase national and international public health engagement [b] above: National and international public health engagement is facilitated through links with health services research. The local ARC, which is a collaboration with the Universities of Cambridge, East Anglia and Hertfordshire, is embedded within the national ARC programme and through that we have made links with national collaborators, for example Kumari is co-applicant of a grant shortlisted by NIHR led by the University of Southampton. International research and training links are on-going in South Africa (Green) and Mongolia (Nolan).

Build on the existing research data infrastructure and support activities [c] above: We capitalise on the biological and health data supplements to *Understanding Society*. *Understanding Society* is the largest household panel study in the world, and is unique in supplementing its detailed social science data with rich biological and health data. The study has been collecting data annually since 2009 from 38,000 households and in 2020 was the first of the longitudinal studies to collect and deposit data related to the pandemic from a subset of its participants (n=17,000). We provide a framework to share data and serve as an exemplar of data documentation and support of use by the academic and wider research and policy communities.

1.4 Establishing links to deliver Impact:

The University has strengthened local ties with the establishment of a Chief Scientific Advisor (CSA) for Essex with Essex County Council in 2017 (Quiroz Flores). Further local public health research ties were cemented by incorporation of the University into the East of England Applied Research Consortium, and the Strategic Partnership and MoU agreed with PHE and ESNEFT (lead: **Nolan**). These links enable the University to contribute strategically to academic public health and health intelligence in the East of England; provide a network for academics in the disciplines of population health and social and data sciences; and contribute to the infrastructure in the local health economy for integrating knowledge from practice, science and policy from social

and data disciplines relevant to public health. Supported by University Impact support funds (£117k in this REF period), our impact and engagement strategy builds on these relationships to develop and establish links so that our public health research can best serve community needs ensuring benefits to the health of the population.

1.5. Open Research, Integrity and Ethics

Open research in its broadest sense is embedded in the shared philosophy of the unit. Opportunities to discuss the department research strategy and policies are available to all staff in ISER and HSC at monthly departmental meetings, research away days, and at Research Committee for those involved. Minutes and recommendations from these meetings are circulated freely to ensure an open research environment. We are fully committed to an open research environment, with institutional resources available for open access to all published research funded by UKRI, as well as to a culture of research integrity, ensuring that our work is conducted according to appropriate ethical and legal standards. Between 2014 and 2020 of 359 articles deposited from the unit in our institutional repository, 245 are gold OA (68%), 76 green OA (21%) and 38 not OA (11%). Researchers are encouraged to deposit data in appropriate data archives, and deposit derived variables and also the code used to conduct the research to ensure replicability of results and publications.

1.6 Long-term Aims

The broad, long-term research aim of the unit from 2021 onwards is to build on these new initiatives. We will expand the overarching institutional organisation as follows: by creating a University Centre to continue to co-ordinate and harness health-related activity across the University; through capitalising and building on our data expertise within the local public health and health worker communities; and by developing our service evaluation expertise to ensure that involvement is implemented earlier in the processes of local government.

Specifically, **biosocial research and biostatistics** will be developed in the following ways:

- a) biosocial research and biostatistics will be expanded to include newly recruited researchers in the SLS so that the unit can incorporate wider environmental determinants into its public health mission;
- b) from October 2020, both Kumari and Clarke will be co-investigators of the ESRC Research Centre on Micro-Social Change (MiSoC) pursuing a bio-social research agenda on the use of proteomics data to explicate the relationship between educational attainment and mental health;
- c) expand the work of the Soc-B post-graduate training programme in biosocial research, which has recently been re-funded, to recruit a further three intakes of students. The programme will broaden research to incorporate data science, through direct and indirect (through MiSoC) collaboration with the Institute of Analytics and Data Science to compliment the University's strategy of developing social and data science.

Mental health and health services research will be developed as follows:

- a) Develop our leadership roles in research applications from ARC theme leaders (Green is Co-I on bids to NIHR Public Health Research programme and the Health Foundation). It is a strategic commitment to grow these collaborations through our presence on the East of England Academic forum, identify new development of areas that are strengths of both ARC and University of Essex such as data science and mental health.
- b) Contribute to the development of a national evaluation hub to support and join up small local health and social care services into an evaluation network. The University of Essex's Evaluation Service is already seen as an expert hub for evaluation methodology across health and social care sectors. For example, we undertook an independent analysis for NHS England on their stakeholder consultation on 'Investing in Specialised Services' which determined the principles and processes by which NHS England would make future

decisions on investment in specialised services. We also undertook a programme evaluation of the ESNEFT self-care and primacy care accelerator programmes. We combine our expertise in service evaluation and development of evaluation toolkits within HSC along with cost-benefit analysis techniques such as Social Return on Investment, employed by staff at the Essex Business School working with the local government sector.

Research Infrastructure and support will be developed as follows:

The *Understanding Society* study has recently secured funding until 2025 with every expectation this will continue into the next decade. The COVID-19 pandemic has highlighted the need to develop remote methods of biosampling. These activities were already underway in *Understanding Society* and provide new opportunities for longitudinal data collection within the study. Innovations such as these capitalise on social science survey methodological expertise within ISER and apply them to health and biomarker research providing new opportunities to the University.

2. People

Staffing strategy

Our strategy is to create, build and develop leadership in biosocial and public health research so our staffing strategy is both to support existing research and to expand the scope of research into new areas that take into account emerging research challenges and opportunities. An example of this can be seen in the recent development of a staffing strategy in HSC focusing on Interdisciplinary Research and Practice. We foster a collegiate and intellectually stimulating work environment supported by a focus on people and infrastructure.

Since 2014, there have been a number of strategic appointments to the University: within UoA2, three women at professorial level (Kumari (biosocial), Grundy (biosocial), Nolan (mental health)); one at Reader level (Barban (biosocial)) and one lecturer in DMS who was initially recruited as a contract researcher in ISER (Bao (biostatistics)) to support the existing expertise in biosocial research and biostatistics (Benzeval, Clarke) and research (McPherson) and infrastructure support (Green). Further to this the University has recruited a number of additional academics to support health research across the institution. For example the first Professor of Human Genetics in the University was recruited to the School of Life Sciences (Schalkwyk to UoA5), who works closely with Kumari to develop social science and genomic research. We will develop links with new appointees to enhance the common social and environmental determinants of the health research agenda.

Staff development and support

The University positively welcomes applications from people of all genders and backgrounds, and offers support to those with families or other caring responsibilities. All members of recruitment panels must have undergone training on equality, diversity and dealing with unconscious bias. Essex has a three-year pathway to permanency period for those appointed to their first lectureship and each has a mentor from amongst the senior staff. Mentoring is organised in a similar way in ISER and HSC, for example in HSC individuals can approach the School Mentor Co-ordinators. Mentors have provided a portfolio of activities to support new staff and support research activities. The co-ordinator offers to pair people up and individuals can be supported as required and dependent on need. This includes activities such as preparation for promotion and provision of advice on research activities. Since 2014, within HSC, McPherson was promoted in 2014 to senior lecturer and to Professor in 2020.

We adhere to the principles of the Concordat to Support the Career Development of Researchers. Particular attention is given to research performance with new staff expected to develop bids for external funding, for which advice is provided by their mentor and the University's Research and Enterprise Office. They are also required to publish on a regular basis. Research activities are

monitored in an annual monitoring exercise and this activity gives the departmental Directors of Research (currently Clarke in ISER and Camille Cronin in HSC) and Heads of Department an opportunity to discuss staff needs. The criteria for permanency emphasise high standards of research performance. ECRs employed specifically as researchers have mentors who provide careers advice, including identifying training opportunities, monitoring progress, and assisting with the search for further posts if and when contracts are due to end. ISER and HSC can nominate ECRs for the University's 'Future Leader programme', taken by Booker and McPherson and more experienced staff for its 'Strategic Leader programme', taken by Nolan and Benzeval in this REF period. All staff are encouraged to supervise and mentor to aid capacity building. Structures are in place to encourage these activities, for example postgraduate studentships are created with supervision panels, which include an early career researcher whenever possible. All new researchers, including postdoctoral researchers (usually recruited as Senior Research Officers), have access to funding for attending conferences and network meetings. In HSC and the Department of Mathematics, all academic staff on ASER (research and teaching) contracts are eligible for a term's research leave following six terms' service. All research staff have taken research leave regularly as and when they have become eligible.

To support a strategy of increased links with the local authority and more broad links with public health, the University created a Chief Scientific Advisor sited in Essex County Council. The MoU with PHE has enabled two student placements with PHE and one with a local authority. The University has a number of mechanisms to recognise, promote and support research and impact, including 'Celebrating Excellence in Research and Impact' which awards small prizes which researchers can use as further seed funds for their research programmes. The unit supports and promotes researchers to apply. In this REF period, Benzeval, Kumari and Clarke (with Pudney) were awarded a research prize for biosocial research in 2014 and McPherson with Beresford, Speed and Taggart in HSC were runners up for the UK public policy prize in 2020 for user engagement work in health and social care.

Evidence of the training and supervision of PGR students

Within the REF period $n=19.4$ post graduate researchers completed their doctorates within this unit. This includes 12.9 postgraduate doctorates and 6.5 doctorates by health care professionals. Students are supported through their training, with a dedicated placement co-ordinator (Wood (2015-2019)) responsible for the placement allocation and McPherson having oversight of all research training components within the Doctorate in Clinical Psychology programme. Strong links have been developed with many NHS trust Research and Development departments to enable successful placements.

ISER hosts Soc-B (led by Kumari in Essex), which was funded in 2016 and has recruited 8 students to date, with the first cohort of three students due to complete in 2021. In HSC, ISER and Soc-B, we endeavour to train inclusive and diverse cohorts of students and part-time as well as full-time study is offered. There is a strong track record of supporting part-time postgraduate students, with about one fifth of graduate students currently studying part-time. For Soc-B, part-time students are fully integrated in the same way as full-time students but are supported to spread their studies over six years to cover the four-year content of full-time studies. We operate a flexible approach with students able to transfer between full and part time study at any point during the programme.

Soc-B runs a +4 programme designed to bring together a cohort of students from a variety of backgrounds ranging across the social and biological sciences. The first year is composed of three modules of training and two 10 week projects designed to ensure baseline level of skill to enable the students to develop their proposals and conduct their research. To facilitate networking and experience outside the academic setting, Year 3 mandates that students take a placement, organised by themselves or by Soc-B. Kumari serves as a point of contact in year 1, guiding students through training rotations and the development of their proposals and identification of supervisory panels. Thus, students have taken placements in PHE and a social enterprise 'Public Place'.

In line with this unit's strategy to harness inter-department expertise, four of the 8 students are supervised by panels from across the University, with supervisors in ISER, Department of Psychology and SLS. Additionally, HSC and ISER co-supervise a PhD student in HSC (funded by the ESRC Doctoral Training Centre (DTC)) researching the impact of the Care Act 2014 on the health and wellbeing of carers and another recently recruited student in ISER, funded by the NIHR ARC fellowship examines employment status and health.

In this REF period, 4 Ph.D students completed health research Ph.Ds from ISER linked to the ESRC Doctoral Training Programme SeNSS demonstrating our commitment to developing research combining social science and health research. Students are given additional career and other training within the Institute; the opportunity to expand networks and horizons through a number of mechanisms, for example University funds to organise postgraduate conferences and additional UKRI research council funds to conduct overseas visits (For example, Crawford supervised by Booker, undertook an Overseas Institutional Visit to the Mailman School of Public Health at Columbia University). These students are now academics, working in third-sector or NHS institutions. The studentships were funded through the ESRC DTC and funded grant research projects.

Booker is the graduate tutor in ISER, Wood (2015-2019) oversaw postgraduate research in HSC and McPherson oversees research training within the clinical psychology doctorate programme. In both ISER and HSC, the graduate tutor organises and provides introductory sessions, regular meetings, cohort building and support activities. Each student is provided with a 'buddy' as another source of support for them. All students receive annual training needs assessments and students participate in a broad range of training activities to develop their wider capabilities and enhance employability. Students have access to *Proficio*, an online portal through which opportunities such as training events, seminars, student competitions, student mentor programs, careers events and careers surgeries are advertised, and each allocated £500 a year to spend on these; they are also encouraged to gain experience chairing their own seminar series, running journal and paper writing clubs and social societies. Students who wish to gain teaching experience are provided with appropriate training and feedback. Research impact training includes input from highly experienced colleagues in areas such as working with the media and institutional, funder and journal press offices; social media, blogging and podcasting; engaging with non-academic individuals and organisations. Students have access to desk/lab space, PCs, IT and software as required and library facilities.

Evidence of how the submitting unit supports and promotes equality and diversity

The UoA recognises the value of diversity and is committed to equality of opportunity. Inclusivity and diversity are modelled in the leadership team of the unit, which is led by a woman (Kumari) with Clarke and McPherson. Kumari, Wood and Booker are minority ethnic women; further professors in ISER are 65% women and 81% in HSC. HSC (Silver) and Department of Maths (Bronze) both hold Athena SWAN awards; and ISER is in the process of applying for a Bronze award. HSC has had an Athena SWAN Silver Award since 2017 (led by Green) in recognition of its work to promote gender equality. Booker is a member of the University's Race Equality Charter Self-Assessment Team. Recruitment processes include equality monitoring and support is provided to anyone reporting a health concern or disability in order to ensure that they have full access to support and training. In order to support research and encourage outputs, the unit guarantees a commitment to providing appropriate support to people on maternity leave (both before, during and on returning to work) and taking care to be inclusive and flexible. For example we hold key meetings in core hours to enable those with children to attend and having many of part-time appointments.

3. Income, infrastructure and facilities

Income

In this REF period, the mean income per FTE in the unit is £2.25M. Notable examples include funding of *Understanding Society*, (Benzeval PI: *Understanding Society*, Wave 12 £16M; *Understanding Society*, waves 13-15 £44M). Funding in this unit is from a wide range of sources including ESRC, NIHR, Health Foundation, European Union and a number of government departments. Members of the UoA have collaborated in projects based at other host institutions funded by ERC and MRC. In addition to national and international funders, funds have been received for local activities, including from the East of England Applied Research Consortium. Securing external income to fund research staff is the responsibility of principal investigators and there is a culture of ambition in seeking external funding within the unit. There is an expectation that each PI will submit two grant applications per year and the training is available to enable this to happen, for example both Clair and Booker have undertaken specific grants training to develop grants-writing skills. Line-management responsibility includes support and review of grant applications to support submission and review of grant applications where unsuccessful to identify future training and other opportunities for development.

Funding has focussed on applications to support investments in research capacity through recruitment across the specialisms that make up Biosocial Research and public health and capital investments in research infrastructure. Biosocial research has been successfully funded by two sources (ESRC: Benzeval £1.3M; ERC: Barban £2M). *Understanding Society* was funded by ESRC to create a genome (5M) and DNA methylation wide scans (£250k and £660k) and proteomics (£660k) resource to undertake biosocial and health inequalities research. This funding positions ISER and *Understanding Society* and its researchers at the forefront of resource and research that combines social and biological data. Additionally, funding has been received to test the roll out of sample collection in the *Understanding Society* Innovation Panel (£1.3M), providing the academic community with new evidence on the practice of participant led data collection required in the post COVID-19 world. Mental health and health services research is evident by the inclusion of University of Essex in the NIHR EoE ARC, which has £9m as the headline figure, and £675,000 coming to Essex. We are committed to supporting research practice through the NIHR Research Design Service, which has £5m attached. Similarly, the Health and Care Research Service has accrued £600K in services to local authorities, social enterprises and other third sector organisations. A further £100k is commissioned in 2020.

Infrastructure and Impact

The unit's approach to impact is to capitalise on the links made by using research funds and 'lab' based approaches to generate impact' and develop a 'policy unit', and policy pipelines, to impact on national and local policy. Research development funds dispersed through events and activities such as a Challenge Lab with Essex County Council in 2017 and another public health challenge lab in 2019 which enable local authority teams to present current challenges to academics and develop collaborative projects and activities will continue. One health related project was initiated in 2018: Designing a system-wide occupational and employment support system in Essex for people with mental illness and learning disabilities (PI: McPherson), which involved stakeholder events with public health leads and employers in Essex and development of evidence based interventions to improve pathways into supported employment opportunities. Five Challenge Lab projects were funded in 2019 creating collaborations between University researchers and a number of partners including HealthWatch Essex, Public Health England, Transport for West Midlands and Warwickshire County Council. Internationally our work has been used to amend European Psychiatric Association guidelines and American Psychological Association guidelines for depression (McPherson) and our work on housing and mental health was adopted by the Australian Government advising practitioners to 'include housing tenure and quality and associated financial commitments in client assessment, to help gauge the level and source of housing stress' (with Pevalin submitted to Uo21).

The *Understanding Society* team includes **The Policy Unit** which is a direct pathway to generating policy impact and ensures the vitality and sustainability of the unit's future impact. The unit has supported analysis of the study's data by co-funders, including the Department of Health and Social Care, by producing bespoke datasets and providing advice on analyses. Similarly, the unit has worked with charities to build capacity for research, for example The Children's Society and Barnardo's collaborated on a joint project using *Understanding Society* to investigate the predictive and protective factors for young people to have good mental health. The study has evidence of 15 examples of new policy development, 5 of which relate to health, for example, evidence from the study on employment and health contributed to the Taylor report; the COVID-19 surveys, deposited before July 2020 were used by SAGE and by Public Health Scotland; PHE have used the data in its COVID-19 mental health and wellbeing surveillance report

<https://www.gov.uk/government/publications/covid-19-mental-health-and-wellbeing-surveillance-report>; the data have also been incorporated into PHE's Local Health tool, which aims to improve availability and accessibility for health and health-related information in England. *Understanding Society* is used by a variety of government and third sector organisations, for example The Welsh Office employs the data for their statutory monitoring of children's wellbeing, both the Children's Society and AgeUK use the Study in their reports on wellbeing and how this could be improved, whilst MIND used data from *Understanding Society* to examine the impact of housing on mental health (<https://www.understandingsociety.ac.uk/research/impact>).

Data from *Understanding Society* have been presented by the Marriage Foundation at an APPG for Strengthening Couple Relationships and Tavistock Relations use the data to examine family environment to develop strategies around mental health and family breakdown. We have organised events to support research, for example in 2019 Kumari hosted a roundtable on biosocial research, focussing on work and health and the use of the *Understanding Society* to inform policy and practice. Our impact case 'housing policy to improve mental health' is an example of the use of *Understanding Society* to inform policy and is leading to additional work with Colchester Borough Council (Clair and Booker). Further, Clair was commissioned to complete a report on this topic by the Health Foundation, a leading UK health policy thinktank.

<https://www.health.org.uk/publications/long-reads/better-housing-is-crucial-for-our-health-and-the-covid-19-recovery>.

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

Our strategy has been to support collaboration across the University and our publications provide evidence of the success of this approach. Researchers in the unit have engaged in successful national and international collaborations, with national health research and with industry. Each research cluster has made a contribution to this area:

- a) **Biosocial Research & Biostatistics.** In the REF period, Kumari in 2014 and Barban in 2017 joined Benzeval and Clarke (ISER) to conduct and develop biosocial research. Benzeval, Kumari and Clarke were funded to conduct properly conceptualised biosocial research with strong theoretically driven social science combined with detailed biology to understand the biological pathways that link the social environment and health. Researchers in this and the infrastructure cluster have published over 300 papers in this REF period. Barban, a social genomicist, brings together demography with biology to understand inequality, fertility and mortality, using big data to account for assortative mating in genomic research. Leading outputs from Barban et al., 2016 (*Nature Genetics* and *Nature Human Biology*) demonstrate a small genetic contribution to age at first birth that increases at older age of first birth. An example of the biosocial approach includes findings from Hughes et al., 2018 (*American Journal Epidemiology*) that contribute to debates on when to target policies in the lifecourse to find that disadvantaged early life socio-economic position is associated with accelerated ageing captured by DNA methylation and Davillas et al., 2016 that contributes to health care policy discussion suggesting that income inequalities in adiposity are dependent on the measure of adiposity examined (*Social Science Medicine*). Bao, Clarke and Kumari carried out important methodological work to discover the limitations of robust methods for Mendelian randomization with multiple SNPs

in estimating the causal effects of exposures (*Statistics in Medicine*). Many of our outputs exemplify the successful interdepartmental collaboration developed by Kumari and Bao with Professor Leonard Schalkwyk in SLS, combining social science with bioinformatic and multi-omic research. Grants in biosocial research have totalled over £5M. International collaboration is evidenced in Grundy (PI) and Kumari who are working with Chinese collaborators (£824k) to investigate families, households and ageing.

- b) **Mental Health and Health Service Research:** Strategic support of mental health and health services research has been enabled with the recruitment of Nolan, the first Florence Nightingale Foundation Professor of mental health nursing, to complement McPherson and Green. Key users and beneficiaries of include Essex County Council, for example, an initiative led by Nolan, acting as public health lead with Essex County Council, to capitalise on links between the Essex Centre for Data Analytics and the Essex Partnership University NHS Trust in a project on the prediction of mental health crises. In addition to the recruitment of Nolan, there is cross-departmental work across the themes on mental health and well-being. Thus, Fonagy et al., a highly impactful publication which demonstrated positive outcomes in a Randomized Controlled Trial of long-term psychodynamic psychotherapy for treatment resistant depression has led to McPherson's work with professional bodies and NHS Trusts on psychological treatments and guidelines for depression. In addition, key publications from the unit include Booker et al., investigating well-being and social media use in *Understanding Society*. This work has led to links with policy makers for example Booker presented her work at the Industry and Parliamentary Trust Breakfast meeting. Investment in early career researchers is seen in the recruitment of Clair and research into housing as a social determinant of mental health. This research has become the focus of initiatives with local authorities and charities including MIND and the Health Foundation. Cross-departmental collaborative research activity is encouraged with academics in departments of Sociology, Sports and Exercise Science, Psychology, Government and Business School. For example, the Essex Human Rights Centre works with the UN special rapporteur for mental health and he was hosted by McPherson in 2019. International collaboration includes a research relationship established by Green with the University of Western Cape in Cape Town which recently secured a development award from NIHR Global Health Policy and Systems Research for an international partnership project (£100K) addressing the effects of urban violence on youth access to health services in South Africa and Brazil. Additionally, Green has established a European project about migrant access to healthcare with University of Uppsala in Sweden, Max Plank Institute of Religious and Ethnic Diversity and University of Jaen in Spain (£10k). Nolan has extensive international links as the visiting professor at the Mongolian National University of Medical Sciences, where she has been engaged in research and mental health service development since 2014. She leads an Erasmus funded 3-year programme (€991501) to develop post graduate specialist training in mental health nursing in Mongolia, the first course of its kind in Asia.
- c) **Research Data Infrastructure and support:** Benzeval, Kumari and Clarke have built on previously available samples and data and within this REF period developed and created a unique 'omics' resource in *Understanding Society*: UK Household Longitudinal Study for use across the University and the academic community. *Understanding Society* in particular is an exemplar of the open research environment to provide support in the use of its data by the academic community through documentation, user guides and a support online. To date, 10 waves of data have been deposited with the UK Data Service at the University of Essex. Further, *Understanding Society* (PI: Benzeval) was the first of the UK longitudinal studies to implement and deposit a COVID-19 survey of its participants with the April, May and June datasets deposited within this REF period. The survey adheres to the principles central to the unit in capturing detailed social and health data to conduct properly conceptualised biosocial research with strong theoretically driven social science combined with detailed biology. *Understanding Society* encourages users to deposit derived variables and also code on our website, in our GitHub or the online repository RESHARE <https://reshare.ukdataservice.ac.uk/> to ensure replicability of results and publications and this is a principle that adhered to across this unit. There has been a broad use of the data by government departments themselves to influence health policy, change current health

policies and monitor national measures to monitor government initiatives, in particular the study is part of the longitudinal cohort studies used directly to inform Sir Patrick Vallance. The impact of the deposited COVID-19 monthly datasets is demonstrated by the 1100 researchers who have downloaded the data in 2020, and the nearly 200 outputs we have identified. *Understanding Society* is a UK infrastructure resource widely used by the research community in the UK and for international comparisons. An example of this use is the project led by Grundy discussed above. To date, there have been over 40,000 downloads of the data by academic researchers. The proportion of international and health users of the dataset has increased substantially in the REF period, for example rising threefold by international users since 2014. Genomic data have also been shared, via data access committees, over 100 times to contribute to national and international consortia resulting in 60 publications in the highest impact journals such as *Nature Genetics* and *Plos Medicine* and *Genome Biology* in the REF period. The data are put to wide and multidisciplinary use, within the University data from the study are used in outputs included in four different units of assessment. The dataset contributes to a number of international comparisons, for example the NIH funded CNEF project to compare lifecourse smoking ([Cross-national Research on Life-course Smoking \(osu.edu\)](#)) and [The Comparative Panel File](#), an open science project to harmonise the world's major and longest-running household panel studies from seven countries: Australia (HILDA), Germany (SOEP), UK (BHPS and UKHLS), Korea (KLIPS), Russia (RLMS), Switzerland (SHP), the United States (PSID). This data support is combined with our expertise in research support with the NIHR Research Design Service for East of England from 2008-2019 (PI: Green), the service was recommissioned in 2019 and remains hosted at the University of Essex having advised on >300 health studies in 2019, connecting with many Health and Social Care teams across the East of England and McPherson jointly establishing (in 2014) and co-directing the Health and Care Research Service. This has been commissioned by (amongst others) NHS England, Health Education England, Alzheimer's Research UK, Southend Borough Council, Essex County Council, Eastern Academic Health Sciences Network and Colchester Community and Voluntary Services to provide over £600,000 in research services and evaluations intervention resources to the public health community.

International research exchange is strongly supported. ISER has hosted a number of visitors: Dean Lillard, Ohio State University; Teresa Seeman, University of California Los Angeles; Daniel Benjamin, University of Southern California; Michelle Kelly Irvine, INSERM, Toulouse III; HSC have hosted Danius Pruras, Vilnius University.

National health research partnerships

The *Understanding Society* team includes a communications unit that regularly organises public events highlighting its use by the research community and other communities. The policy unit links across commercial and other sectors including PHE and NHS foundation trusts. Kumari is a member of the East of England Academic Public Health forum which provides strategic guidance to academic public health, linking all local actors such as HEI, local authorities, the CRN, PHE and CCG. The forum has organised a number of events to encourage networking and collaboration, with topics such as obesity, migration and evaluation, the latter held at the University of Essex. Green is the University's patient and public involvement (PPI) expert, providing links for NIHR across the local HEI with strong links to the Clinical Trial Unit (CTU) of the University of East Anglia. Green was NIHR lead for PPI from 2012-2019 and also acted as a member of the INVOLVE executive group from 2015-19. Thus ensuring public engagement in research as INVOLVE is the lead for advancement of public involvement in health and care research across NIHR and beyond. The NIHR RDS advised on over 300 health studies in East of England in 2019. As co-director of the Health and Care Research Service, McPherson has provided research expertise and consultancy to various mental health services including services for parent and infant mental health, Tavistock and Portman NHS Trust, Tavistock Relations and other psychotherapy and counselling organisations.

Links with Industry and third sector

University links with business are established and are being further developed; recently a health related project was developed with Orbital Media which created a scalable digital avatar to provide real time health advice, winning a prize at the University annual Knowledge Transfer Partnership awards. We have links with a range of third sector and charity funders (e.g. Eastern Academic Health Sciences Network, Stockport Metropolitan Borough Council, Alzheimer's Research UK, Family Action, Homestart Essex, National Institute of Health Research, Community 360, Strengthening Families Service, Southend YMCA, Princess Alexandra Hospital, A Better Start Southend, NHS England, Health Education England). Recently the University was commissioned (PI Vasilios Ioakimidis) to support research and evaluation within the community programme 'A Better Start Southend' in collaboration with Southend County Council who are working on £40m Big Lottery funded project aimed at public health intervention.

Wider activities and contributions to the research base/economy and society

University of Essex researchers contribute on an individual basis to the discipline and wider research base both nationally and internationally, bringing their particular expertise to a broad set of academic, training and policy endeavours.

a) Academic collaborations and wider contribution to the discipline**Collaborations and networks**

Regular weekly seminars are held to enable external academics to visit the University. Staff organise and contribute to a wide range of external workshops, conferences, and networking events. Notable events include the annual 'masterclass' events conducted by **Benzeval** and **Kumari**, inviting Kelly-Irving (Toulouse, France: 2016), Seeman (UCSF, USA, 2017) and Benjamin (UCSC, USA, 2018) to conduct workshops to discuss contemporary issues in biosocial research. During this REF period staff have collaborated with academics in Australia, Brazil, Canada, China, Finland, France, Germany, Greece, Italy, Ireland, Japan, Mongolia, New Zealand, Norway, South Africa, South Korea, Spain, Switzerland and USA. These international collaborations were funded and supported by a range of domestic and international organisations: University of Essex International Visiting Scholar Fund; British Council; Economic and Social Research Council.

Organisation of meetings, workshops, and conferences

We hold the *Understanding Society* (**Benzeval**) conference in the University in alternate years which, in this REF period (2015 and 2017), was attended by 300 participants from 10 different countries. **Clarke** organised the UK Causal Inference Meeting (UKCIM, now EuroCIM) at the University of Essex in 2017. Staff also play central roles in organising **national and international conferences** outside of Essex, for example, **McAllister** was Member of Scientific Committee of Oxford Dysfluency Conference 2017, 2020. **Grundy** was on the International Organising Committee, International Union for the Scientific Study of Population International Congress, Cape Town 2012-2017 (conference 2017).

b) Indicators of wider influence and recognition:

Membership of councils and international committees: Staff play key roles in disciplinary leadership; **Benzeval**, Society for Social Medicine; **Clarke**, steering group member of the European Causal Inference Meeting and Jon Rasbash Prize for Statistics 2016-2018; **Green**, Executive Group member of NIHR INVOLVE (2015-2019); **Grundy**, Member of the Norwegian Institute of Public Health Centre of Excellence on Fertility and Health; **Kumari**, Member of Executive committee of Society of Lifecourse and Longitudinal Studies. Kumari has also accepted an invitation to serve on the UoA2 REF Sub-Panel; **Nolan**, Mental Health Nurse Academics UK.

Elected fellowships and awards:

Benzeval is a visiting Professor, University of Glasgow; **Grundy** was elected Fellow of Academy of Social Science and Fellow of the British Academy (2017); **Kumari**, Clarivate highly cited researcher 2018, Honorary Professor UCL.

Keynotes/lectures/conference chair roles:

Staff have presented widely including **Clair**: Invited plenary at the Housing Rights Private Rented sector conference (2020), Chartered Institute of Environmental Health conference (2020), London Assembly (2019); **Green**: session chair: INVOLVE (2016): STS (2014); **Grundy**: International Organising Committee, International Union for the Scientific Study of Population international congress, Cape Town 2012-2017 (conference 2017); **Kumari**: Keynote speaker Karolinska Institute (2018), symposia chair SLLS (2017-2019); **McAllister**: Keynote Lisbon (2014), Rome (2015)

Journal Editorial roles:

Staff involved in journal editorship include **Booker**: Associate editor of *Ethnicity and Health*, Associated editor of *BMC Public Health*; **Clarke**: associate editor of *Journal of the Royal Statistical Society, Series C* 2014-2017, **Grundy**: Editor of *Population Space and Place*; *Journal of Gerontology, Social Science*; **Senra**: Editorial board, *Disability and Rehabilitation*.

Participation in grants committees:

Benzeval: MRC multimorbidity funding board, Expert Review Panel for Mental Health Data Hub; Expert Review Panel for Pain Research Data Hub; ESRC COVID panel; UKPRP Expert Review Group Secondary Data Analysis Projects 2019 (SDAP-2019) grant scheme, Health Research Board, Dublin, Eire ; **Grundy**: British Academy funding Board; **Kumari**: MRC Newton Fund and Wellcome Trust Longitudinal Population studies, BBSRC-ageing across the lifecourse working group; UKRI 'COVID-19 and Ethnic minority group, **Clarke**: ESRC grant assessment panel 2013/4; **McAllister** NIHR, ESRC, Wellcome Trust, Newton Trust.

External membership of research committees:

Kumari acts as the Independent Chair of NIHR funded 'Longitudinal Outcomes of Gender Identity in Children' (LOGiC) study.

Refereeing Activity:

Unit staff are heavily involved in peer review processes both for funders and outputs. Staff review for a number of UK funders including ESRC, Wellcome Trust, British Academy, Leverhulme, Dunhill Medical Trust and MRC. Additionally, staff review for international funders such as Research Council of Norway, Health Research Board, Ireland, Health Research Council for New Zealand, Austrian Science Fund, Hong Kong Research Grants Council.

Staff review for over 100 public health and interdisciplinary journals: including *Nature Genetics*, *PNAS*, *BMJ*, *Psychological Medicine*, *Psychoneuroendocrinology*, *Brain*, *Behavior and Immunity*, *International Journal of Epidemiology*, *American Journal of Epidemiology*, *Preventive Medicine*, *American Journal of Public Health*, *Journal of Epidemiology and Community Health*, *International Journal of Obesity*, *Journal of American Statistical Association*, *Journals of Royal Statistical Society Series A and Series B*, *Biostatistics*, *Statistics in Medicine*, *Social Science and Medicine*, *Sociology of Health and*

Illness

PGR training: Unit staff are involved with, have contributed to or have conducted a number of postgraduate training programmes and events, including **Benzeval:** NCRM, Festival of Social Science biosocial research; **Nolan:** Mongolian Mental Health Nurse Training programme; **Kumari, Bao:** Soc-B, *Understanding Society* workshops in Biosocial Research, Oxford Summer School in Sociogenomics, workshops in Lifecourse research SLLS. **Benzeval, Kumari, Grundy, Clarke** and **McAllister** have all examined Ph.Ds nationally and internationally.