

<p>Institution: City University London</p>
<p>Unit of Assessment: 3 Allied Health Professions, Dentistry, Nursing and Pharmacy</p>
<p>a. Overview</p> <p>The School of Health Sciences at City University London comprises the former School of Allied Health Sciences and the St Bartholomew School of Nursing and Midwifery. In the current REF period we have made organisational and strategic changes to build on our success in RAE 2008 and our longstanding strengths in the fields of Nursing and Midwifery, Optometry and Visual Science and Language and Communication Sciences. These changes, which include the appointment of 24 research-excellent staff across all areas of our work, have allowed us to strengthen further the impact and quality of our research output.</p> <p>Research activity is located and co-ordinated in six Research Centres relevant to this Unit of Assessment: Language and Communication Sciences; Applied Vision; Health Services Research; Maternal and Child Health; Mental Health; and Public Health. Academic and research staff in the fields of Nursing and other professions are distributed across the Centres. These Centres each contain several Research Groups with a specific research focus. Research Centres have been introduced in the current REF period to facilitate interdisciplinarity, in recognition of the need to move beyond a discipline-based approach when producing world class health research. Different disciplines within the Centres collaborate on Applied Health research and there is also frequent collaboration across the Centres, particularly in relation to responses to grant calls, research seminars and specific seminars on research methodology. Where beneficial to research, collaboration also takes place with other Schools within City and with other institutions in the UK and overseas. To support research activity, we have introduced research expertise and support in cross-cutting disciplines such as health economics, statistics, qualitative and quantitative methodologies, systematic review methodology, meta-analysis, evaluation of complex interventions, implementation science and behaviour change methodology. At the capacity-building end of the spectrum, we make a substantial contribution to research training by offering 28 postgraduate courses with structured pathways leading to MRes, MPhil/PhD qualifications and post-doctoral research.</p> <p>The School has developed strong links and partnerships with all the major health providers in the locality, including Bart's Health, Homerton University Hospital NHS Foundation Trust, University College Hospitals NHS Foundation Trust and Moorfields Eye Hospital NHS Foundation Trust, to support clinically applied research. In addition, we have become an executive partner of the University College London (UCL) Partners Academic Health Science Centre and a member of the Local Education and Training Board (LETB). Some examples of our research that has wide impact include telehealth (Newman <i>et al.</i>, Cartwright <i>et al.</i> and Hirani <i>et al.</i>); self-management of chronic disease (Newman <i>et al.</i>); colour vision (Barbur <i>et al.</i>); glaucoma (Lawrenson and Crabb <i>et al.</i>); eye movements (Crabb <i>et al.</i>); visual perception (Tyler <i>et al.</i>); care of older people (Meyer <i>et al.</i>); midwifery (Macfarlane and McCourt <i>et al.</i>); impact of childbirth on mothers (Ayers <i>et al.</i>); HIV (Elford <i>et al.</i>); innovative treatments for dysphasia (Marshall <i>et al.</i>); language and deafness (Morgan <i>et al.</i>); cognition and language (Botting <i>et al.</i>); and renal dialysis and transplantation (Newman <i>et al.</i>).</p> <p>b. Research strategy</p> <p>The School's research strategy has been revised since RAE 2008 to achieve world-leading applied healthcare research that impacts policy, service delivery and practice. The strategy is designed to support staff to: conduct, publish and disseminate high quality applied clinical and health services research which impacts on health outcomes and patient benefit; continue to develop and extend research links within the University (particularly in the fields of health informatics and the social sciences); further extend national and international partnerships in research; create strong partnerships with service providers; enable clinical research to be conducted in healthcare settings; facilitate links to commercial companies; foster enterprise activity and the School's intellectual property by extending its links with significant commercial companies such as Baxter Healthcare, Phillips and Bosch Healthcare (Professor S. Newman <i>et al.</i>) and Max-Planck (Professor M. Morgan FRS); link the research conducted in the School to its educational activities; promote new researchers and PhD students by providing high standard research training at all levels with a specific focus on Masters research training (e.g., NIHR MRes Programme) and a thriving</p>

community of PhD students.

The strategy has included the development of Research Centres to create a coherent organisation of research within the School. In addition, the University has made a substantial financial investment of £165M to support the expansion of infrastructure, estate and research, which has enhanced the School's capacity for research activity. Other enhancements that have led to a strengthening of the research environment and the achievement of strategic aims include:

a. Recruitment of 42 new research-excellent staff with significant professorial-level appointments including Professor S. Ayers (from the University of Sussex) specialising in maternal and child health psychology (£2.3M personal research funding since 2008); Professor J. Francis (from the University of Aberdeen) specialising in behaviour change and health psychology (£6.5M personal research funding since 2008); Professor C. Tyler (from the Smith-Kettlewell Brain Imaging Centre) specialising in psychophysiology, visual perception and neuroscience (£2.5M personal research funding since 2008); Professor L. Henry (from London South Bank University) specialising in memory and higher order thinking processes in children with a range of intellectual and developmental disabilities (£1.6M personal research funding since 2008); Professor L. Aitken (from University of Melbourne, Australia) specialising in intensive care/critical care (£1.8M personal research funding since 2008); and Professor Newman (from University College London) with his Health Services Research Group specialising in self-management of chronic disease and telehealth (£8.6M personal research funding since 2008).

b. Investment in 43 University and School PhD studentships during the REF period with doctoral student recruitment increased to 12 each year for the past two years.

c. Increased support for research through the School Research Office to provide seamless support from idea through to submission, conduct of the research and publication.

d. Executive membership of a major Academic Health Science Centre (UCL Partners) which increases the School's ability to engage in large collaborative research initiatives including implementation research in applied health settings.

e. Investment of £1.5M in electronic journal subscriptions enabling access to over 1000 journals for staff and student use.

f. Creation of strategic links with NHS trust partners [Bart's Health, UCL Hospitals & East London Foundation NHS Trust] for joint sponsorship of research posts. This support includes two posts in Mental Health, two posts in Chronic Disease Management and research funding.

g. A significant investment of £1.5M in IT infrastructure within the School to support research. This complements the additional investment made through central University funds.

h. Development of links to major commercial companies to support research and enterprise including Phillips Healthcare with whom we now share a joint European Grant (€1.6M) and support for our Telehealth Laboratory; Bosch Healthcare who support our Telehealth Laboratory and Baxter Healthcare who have supported us through grants of over \$150,000 for our work on the assessment of recovery from surgery and anaesthesia.

i. Instigation of initiatives to develop Academic Clinical Research Leaders in Nursing, Midwifery and Allied Health Professions through the School's association with Bart's Health and UCL Hospitals.

The School's Research Strategy and research plans are formulated and maintained in a dynamic state, overseen by the School's Research Committee. Plans for research are discussed at an early stage within the Research Centres. Generic grant calls are circulated from the School's Research Office with meetings held across Centres. We are responsive to national and international priorities and initiatives through monitoring and circulating grant calls and through our presence on national and international research bodies including groups such as the National Institute for Health Research (NIHR); Research for Patient Benefit (RfPB), Age UK and UCL Partners.

The Research Centres co-ordinate a response to grant calls, discuss potential grant applications and, to promote collaboration, bring potential applications to Research Group meetings facilitated by the Associate Dean for Research for broader discussion. Grant applications are reviewed by senior academic staff where appropriate, particularly when they are destined for Research Councils and other major funders in response to demand management expectations. In addition, the School holds a bimonthly Dean's Lecture Series with internationally-renowned speakers. Details of the Research Centres with examples of Research Group activity are presented below.

In the next REF period, the strategic aims and goals for research as delineated above will be sustained and expanded upon to achieve further impact through the Research Centres. The

Research Centres are constructed to be flexible so as to incorporate new research groups as areas of research become apparent. We will continue to appoint staff both in areas of our strength and in new areas to allow us to meet the needs of an evolving research agenda in health.

The Language & Communication Sciences Centre submits 22 academic and research staff to REF 2014. The Centre has 23 PhD students currently registered. Since 2008 the staff have attracted over £12M in research funding as either Principal or Co-Investigators and generated approximately 171 peer reviewed publications. Awards include a share of the £5.5M ESRC grant for the Deafness, Cognition and Language Research Centre (DCAL) to Professor G. Morgan; three Nuffield Foundation grants totalling over £350,000 to Dr R. Herman and Professor P. Roy; awards totalling over £600,000 from the EPSRC, Bupa Foundation, Tavistock Trust for Aphasia and Stroke Association to Professor J. Marshall; funding of £67,000 from the Dunhill Medical Trust to Dr N. Cocks; and ESRC awards totalling over £300,000 to Professor S. Chiat and Dr N. Botting.

Research Groups:

a. The Gesture, Deafness & Sign Research Group, led by Professor Morgan, which explores specific language impairment in signing, theory of mind in deaf children, reading in deaf children and spoken versus sign language acquisition. The group has developed the first standardised clinical assessment of language impairment in British Sign Language (BSL), examined the impact of acquired language and cognitive impairments on sign language and published the first investigations of aphasia in users of British Sign Language. It co-hosts the Deafness, Cognition and Language Research Centre (DCAL) with UCL.

b. The Adult Assessment & Intervention of Language & Speech Disorder Group, led by Professor Marshall, has generated aphasia therapy and assessment approaches that are recommended in National Clinical Guidelines and widely used nationally and internationally.

c. The Development Assessment & Intervention Research in Speech & Language Group, led by Professor Chiat, investigates the identification, impact and treatment of developmental language disorders. It has developed diagnostic tools that are widely used in practice and has led research into the long-term consequences of language disorder and their remediation.

The Applied Vision Research Centre submits 18 academic and research staff to REF 2014. The Centre has 22 PhD students currently registered. Since 2008 staff have been involved in raising grants totalling in the region of £10M. These include grants from the Wellcome Foundation (£582,000) to investigate 'The Calibration and Recalibration of Visual Space'; Baxter Healthcare (\$150,000 USD), the Clothworkers Foundation (£150,000) and the Max-Planck Society in Germany (€6,000) for student research relating to the work of Professor M. Morgan FRS. Professor Morgan has recently achieved an H-index of 50 on Google Scholar. Since 2008 staff in this Centre have generated over 220 peer reviewed articles in high impact journals.

Research Groups:

a. The Ocular Optics and Instrumentation Research Group, led by Professor J. Barbur. Research areas include advanced vision testing, ocular optics and retinal imaging. This group has developed a new Colour Assessment and Diagnosis (CAD) test that has resulted in worldwide changes in colour assessment within occupational environments.

b. The Visual Neuroscience and Psychophysics and Neurobiology Research Group, led by Professors R. Douglas and J. Solomon (includes Professors Morgan FRS and Tyler). Areas of research include examining peripheral and central components of the visual pathways with a range of experimental approaches, extending from molecular biology and neuroimaging to anatomical and physiological methodologies; and behavioural analysis of vision.

c. The Measurement Techniques in Vision Group, led by Professors D. Crabb and Barbur. Research focuses on glaucoma and other diseases of the eye and has led to changes and improvements in screening for glaucoma at national and international level.

The Health Services Research Centre submits 35 academic and research staff to REF 2014. The Centre has 30 PhD students currently registered. Submitted staff in the Centre have won grants totalling over £25M since 2008. Grants include £3.5M to Professor Newman (H-index 51 on Google Scholar) and Dr S. Hirani to study the role of assistive devices; a component of an NIHR programme grant valued at £418,580 to Professor Francis on the development and evaluation of enhanced audit and feedback interventions to increase the uptake of evidence-based transfusion

practice; a European Community Grant of €1.6M to Professor Newman to implement collaborative working and telehealth in long term conditions; and a Bupa grant of £240,000 to Professor Newman and Dr Hirani on self-management and the role of personalised genetic information in diabetes. The Centre's focus is on aspects of patient care within the translational pathway to improve health outcomes. Since 2008 staff in this Centre have generated over 460 peer reviewed articles.

Research Groups:

- a.** The Self-Management of Long Term Conditions Group, led by Professor Newman. This group has developed and evaluated self-management interventions through grant-funded research into conditions including heart failure, diabetes, renal dialysis, benign prostatic hyperplasia and rheumatoid arthritis. It performs its translational research through training healthcare professionals to facilitate behaviour change in patients and evaluating the effectiveness of these interventions in randomised controlled trials. Examples of evidence obtained include: behaviour change in Type 2 diabetes; fewer symptom reports and reduced intervention in benign prostatic hyperplasia; reduced mortality and morbidity in newly diagnosed heart failure patients; and improved clinical outcomes in renal dialysis (winner of best abstract at the European Renal Association meeting in 2013).
- b.** The Telehealth & Telecare Group, led by Professor Newman. This group led the Whole System Demonstrator Project that investigated the role of assistive devices in long-term conditions and the frail elderly in the two largest randomised controlled trials of telehealth and telecare in the world. The findings of these studies have been used to inform government policies in the UK (e.g., 3 Million Lives - www.3millionlives.co.uk) and around the world. The group has undertaken funded research in mobile health technologies and use of the web to support parents of children with juvenile arthritis, to deliver aphasia therapy and to facilitate self-help to improve post-natal wellbeing. It has strong links with industry, NHS Trusts and the Department of Health (England).
- c.** The Quality of Care for Older People Group, led by Professor J. Meyer. The group focuses on conditions of the elderly, the frail elderly and continuing and end-of-life care for older people and caregivers. It has influenced national and international healthcare policy decisions. The group has developed a flagship programme, *My Home Life (MHL)* (www.myhomelife.org.uk), which is a UK-wide initiative to promote quality of life in care homes for older people and has been endorsed in the Government's White Paper *Caring for Our Future: Reforming Care and Support* and in the final report of the Commission on Dignity *Delivering Dignity: Securing dignity in care for older people in hospitals and care homes*. The group also has a focus on caregivers; it has performed the largest study of carers of the frail and elderly in people receiving telecare. It is also involved in examining the impact of telecare on carers of people with dementia through a large NIHR grant.

The Maternal and Child Health Research Centre submits 10 academic and research staff to REF 2014. The Centre has 12 doctoral students currently registered. The staff members have been involved in raising over £9M in the last five years through research grants, consultancy and project work. Funders include the Medical Research Council, NIHR, EU Public Health Directorate, ESRC, NHS and charitable organisations. Notable grants include the EU-funded Europeristat project looking at birth outcomes across Europe; the NIHR-funded Birthplace in England study of birth outcomes in the UK for women who give birth at home, in hospital or in midwifery-led units; and the NIHR-funded preterm birth study, a programme of research examining care during very preterm births. Since 2008 submitted staff in this Centre generated over 85 peer reviewed articles.

Research Groups:

- a.** The Models of Care in Maternal and Child Health Group, led by Professors C. McCourt and A. Macfarlane. The group focuses on evaluating different models of maternity services and care to provide the evidence base for improvements to care. It also evaluates appropriate uses of technology; service change and development; and professional issues. It works on the Birthplace in England study, which has demonstrated that while there is no significant difference between birth settings in adverse neonatal outcomes, significantly better outcomes occur at home and in midwife-led units compared to hospital, and that out-of-hospital births are more cost-effective than hospital births. This work has led to a series of high impact publications.
- b.** The Maternal and Child Health Education and Community Health Group, led by Professor Ayers. This focuses on the mental health and psychological wellbeing of mothers, their partners and children. The work has identified mental health needs and the impact of mental health difficulties on families and parenting with a view to improving screening and treatment for mental

health problems during pregnancy, after birth and in pre-adolescent children.

The Mental Health Research Centre submits 10 academic and research staff to REF 2014. The Centre has 7 PhD students currently registered. Staff being submitted raised approximately £7.6M in grant income since 2008 as either Principal or Co-Investigator and have generated over 55 peer reviewed publications. Notable grants include two NIHR Programme Grants for Applied Research awarded to Dr M. Haddad, firstly to fund a study into the relationship between coronary heart disease and depression in primary care patients and a further £2M in 2013 to develop a collaborative care intervention for prisoners with common mental health problems, near to and after release. Professor A. Simpson has been carrying out an evaluation of a preceptor programme for newly qualified mental health nurses funded by the East London Foundation Trust and is currently completing a £400,000 cross-national comparative study of recovery-focused mental healthcare planning and co-ordination, awarded by NIHR Health Services and Delivery Research. One of the Centre's focuses is on the involvement of service users and carers in all aspects of the research process and the employment of service users as researchers.

Research Groups:

a. The Mental Health Nursing Group led by Professor Simpson. This Group focuses on evaluations with a view to improving mental health nursing intervention and partnership working with mental health service users and carers. It has examined collaborative care planning in community mental health settings; evaluated the delivery and effectiveness of protected engagement time on mental health wards and evaluated collaborative care intervention for prisoners with common mental health problems.

b. The Long-term Mental Health Conditions Group led by Dr Haddad. The group has a growing body of research on co-morbid physical and mental health conditions where studies have included a personalised approach to physical health in a secure mental health unit; the identification and management of aggression on haemodialysis units; postnatal care of women with mental health problems and substance use in mental health service users.

The Public Health Research Centre submits 23 academic and research staff to REF 2014. The Centre has 19 PhD students currently registered. It is a new Centre which has re-organised the research activity of existing staff and recruited several new staff members. Staff have been involved as either Principal or Co-investigator in raising over £11M in research grants since 2008 and generated 189 peer reviewed publications. Examples of grants include a £307,628 Health Technology Assessment grant awarded to Professor Crabb on Rapid Trials to inform Clinical Decision-Making and £294,287 awarded to Professor J. Lawrenson from the College of Optometrists on Enhanced Evaluation. The Centre has a focus on general public health issues, with staff members involved in research on particular aspects of this general field.

Research Groups:

a. The Ophthalmic Public Health Research Group, led by Professor Lawrenson, which aims to advance understanding of interventions and evaluation of those interventions within an eye care setting focusing primarily on optometry. Most recently work has focused on glaucoma screening and produced several systematic reviews associated with glaucoma screening and management.

b. The Maternal and Child Public Health, Social Diversity and Inequality Group led by Professor MacFarlane. The group's research focuses on health and care for women and children from marginalised groups, such as young mothers, homeless and migrant mothers and children. It has examined inequalities in maternal and child health outcomes that have been used to inform policies and improve services for disadvantaged groups.

Plans for the forthcoming REF period, as stated above, involve sustaining the School's strategic aims and goals for research and expanding upon these to achieve further impact through the Research Centres. Our response to national or international priorities will continue to occur through direction by the School's Research Committee and management at the Research Centre level. Promoting and disseminating our research will occur through regular communication with the University's Press Office to ensure media coverage; our contacts with policy makers (e.g., Speaker of the House of Commons, the Rt. Hon. John Bercow MP); events such as the Dean's Lecture Series; and conferences and peer reviewed journal publications.

c. People, including:

i. Staffing strategy and staff development

Research in the School of Health Sciences is led by the Dean, Professor Newman, who is supported by an Associate Dean for Research and Enterprise. In recruiting new staff to the School, strategic fit with our established Research Centres is a key criterion. For example, Professor Ayers was identified as a leader in the emerging area of Maternal Child Health and was recruited to lead the Maternal and Child Health Research Centre and the Maternal and Child Health Education and Community Health Group. Professor Henry, a leader in intervention strategies associated with executive functioning in language impairment, was recruited to the Development Assessment & Intervention Research in Speech & Language Group. Professor Tyler was recruited to mentor early career researchers in the field of Visual Neuroscience and Psychophysics. We also recruit staff to develop complementary areas of research such as Dr M. Laudicalla in Health Economics and Professor Francis in Implementation Research.

Academic staff work in partnership with NHS-employed clinical academics through the Research Centre structure. This ensures contemporary clinical knowledge and fosters clinically applied research. For example, the School's links with Bart's Health, UCL Hospitals, East London and the Homerton NHS Trusts as well as UCL Partners have facilitated opportunities for collaborative research and enabled the integration of full-time clinical staff into research activity. For example, Dr G. Rose and Mr D. Ezra of Moorfields Eye Hospital work with the Health Services Research Centre on the impact of Thyroid Eye Disease surgery on patients and the impact of Strabismus on patients. Clinical academics are appointed to honorary clinical academic posts in the School and enjoy the same access to development and training opportunities as our academic staff. Where appropriate they also have the opportunity to participate in the supervision of MPhil/PhD student research projects.

The School's Research Office (3.0 FTEs) supports research activity by co-ordinating responses to grant calls and organising seminars as well as supporting all aspects of grant submission including ethics and Research and Development (R&D) submissions. The Office also supports quality monitoring of MPhil/PhD Programmes. A Research Sustainability Fund and Travel Grant Fund are provided to support staff in their research activity and staff are fully funded when presenting research at conferences. In addition the School has an Enterprise Officer to support the exploitation of academics' intellectual property.

To support staff research and promote international links the University has a generous sabbatical policy to encourage research-active academics to travel to other institutions to foster research collaborations, develop research proposals, write up research and acquire new research techniques. A member of academic staff may apply for sabbatical leave for a period of time up to a maximum of one-seventh of service at the University. Recent sabbaticals include Professor Lawrenson for one year in 2010, during which he produced three Cochrane Reviews on Nutrition and Age Related Macular Degeneration; Professor Solomon for three months in 2012, during which he worked in the USA and France and developed a research proposal; and Professor G. Morgan for nine months in 2010, a period which led to five peer reviewed publications and a visit to the *Centre National de la Recherche Scientifique*, France, to initiate collaborative research.

The School fully supports all research-active staff and students to present their work and attend conferences through the Travel Grant Fund. Presenters are fully funded for registration, travel, accommodation and subsistence. Annual reviews are undertaken to ensure that staff development initiatives target staff training and research development needs.

To support academic staff and research students seeking to develop their research profile, research training is offered along with integration into Research Groups. The School's Research Sustainability Fund is used to assist staff in establishing research activity through pump-priming grants, to extend research funding to ensure that specific outputs can be attained and to bridge between grants so that research staff are retained.

The University holds a competition for small grants to act as research pump-primers. These grants are designed to enable new researchers to conduct pilot or feasibility studies and gather data for a full grant application. Pump-priming research grants resulted in School staff being awarded £34,417 in 2011/12 and £36,991 in 2012/13. In addition to the University Pump-Priming Fund in 2013 the School awarded £116,774 to academic staff to pump-prime 11 research projects. Examples of pump-priming include Dr P. Constable's award to examine the crowding effect in autism spectrum disorders and an award to Dr M. Cruice and Dr L. Dipper which explored the

impact of communication disability on one's capacity to talk about quality of life.

Our commitment to research excellence is reinforced through recruitment, appraisal and promotion processes. In the last few years we have recruited 24 senior research-excellent staff to support current research and to open up new areas of research such as Health Services Research and Public Health. In relation to sustainability of the staff structure, an appropriate balance between professors, as leaders in their field, and more junior academic staff within research groupings has been established so that appropriate mentoring and staff development in research expertise occurs for all our staff. This approach is designed to facilitate the development of early career researchers and provide support for integrating them into the School's wider research culture.

In line with the Concordat to support the career development of researchers, priority has been given to the recruitment and retention of academic and research staff with the highest potential to achieve excellence in research. All new staff are allocated a mentor specifically to ensure that their training and support needs are met with the aim of ensuring they develop into independent researchers. They are encouraged to attend the extensive staff training available including the specialist research skills programmes in the University as well as that provided by the School. The University received the European Commission HR Excellence in Research Award in May 2012 on the basis of its Concordat implementation plan. Alongside the researcher development programme, a key component was the introduction of new terms and conditions of employment for research staff from August 2012. These have made continuing contracts the norm for research staff in place of fixed-term contracts, and introduced parity with academic staff on pay progression, annual leave and sickness entitlement and access to promotion opportunities. The appraisal process for research staff also requires consideration of career development needs alongside project performance. City received a mention in the May 2013 Vitae review of HR Excellence in Research implementation plans as an example of good practice. Staff development is supported and monitored through the University Annual Research Quality Monitoring process which reviews the quality of research publications.

The School follows the University Equalities and Diversity Policy which includes a suite of reward and employment strategies linked to the achievement of the University's research objectives. Strategies are targeted toward recognition of staff performance and contribution regardless of age, race, culture, gender or sexual orientation. The strategy promotes a diverse workforce and is designed to engage and motivate staff. It provides a fair and coherent strategic framework which allows flexibility in recruiting and retaining the best possible research-active staff.

ii. Research students

The MPhil/PhD programme is managed by the Associate Dean for Research and Enterprise with the assistance of the Research Office, Research Degrees Administrator and the Research Degrees Committee. The School has maintained forward momentum in capacity building. The general approach for development of research students follows the 1+3 model where we encourage prospective PhD students to undertake a research based Masters degree prior to embarking on PhD research. To this end we have developed a series of research-based Masters courses in fields including Health Services Research, Public Health, Health Policy and Health Management. One of these is the NIHR Masters in Clinical Research (MRes), for which the School has received support for 12 students per year for three years from the NIHR. All courses include research modules coupled with an empirical-based research dissertation that should be of publishable quality.

We currently have 121 students registered for an MPhil/PhD. 66 PhDs have been awarded since RAE 2008. To foster capacity building we have awarded one post-doctoral fellowship and 27 doctoral studentships during the REF period (ten in 2011/12, twelve in 2012/13 and five in 2013/14) which provide a fee waiver, bursary of £16,500 per annum and £1,000 toward conference attendance and other expenditures.

We have implemented a robust strategy for developing and supporting students, which includes monthly research seminars, colloquia, an annual research conference and funding for conferences and other special research events. Students are integrated into one of the Research Centres. They are also encouraged to undertake a small amount of undergraduate teaching as part of their career development. Prior to this they are required to take the Introductory Certificate in Academic Practice run by the University's Learning Development Centre. Additional learning and development activities are offered through the University's virtual learning environment, Moodle.

Students can apply for funds to support their research from the School and also through the University's Graduate School. The Graduate School also provides a focus for the research student community across the University and an opportunity for further interdisciplinary exchange.

The School encourages all potential research students to discuss their application with academic staff prior to submitting an application. The University's website provides information on the School's research structure and the research interests of its staff to help applicants identify potential supervisors and relevant Research Groups. All applicants submit a proposal that is assessed by the Research Degrees Committee and the Research Office, together with potential supervisory teams. If accepted, all research students benefit from the support of two supervisors, one of whom must have supervised at least one PhD candidate through to award. Project advisors and external supervisors are co-opted as necessary. The Associate Dean for Research oversees the PhD programme including recruitment and issues of student monitoring and progression, supported by a dedicated staff member in the School Research Office. The University provides formal training for new supervisors and updates for experienced supervisors. All full-time PhD students have their own workspace and computer which is within the vicinity of their supervisors. New students enter into a learning contract agreed with their supervisors and progress is formally reviewed after six months. Thereafter, progress is formally reviewed at least annually by a member of staff independent of the supervisory team. An electronic monitoring system has been implemented University-wide (the Research and Progress system) where students record their supervision and training and supervisors record progress through annual progress reports and comment logs. Full-time students upgrade from MPhil to PhD by formal presentation and *viva voce* examination, normally at 18 months for full-time students and after two years for part-time students.

Several students have received prestigious studentships and fellowships during the REF period, including NIHR doctoral fellowships to Lucia Rocca (Maternal Child Health) and Matthew Grundy-Bowers (Health Services Research). Pelin Dikman (Maternal Child Health) received a Turkish Government Scholarship and Camilla Schnck (Maternal Child Health) a Leverhulme Scholarship. Several graduates of the PhD programme have secured employment within the School upon completion of their degrees (Marisa Rodriguez Carmona as a Research Fellow and Wei Bi, Evgenia Konstantakopoulou, Nick Smith, Fiona Glen and Haogong Zhu as Research Assistants). PhD graduates have also secured positions at other institutions. Successes include the following: Michelle Pettinato (Research Associate, Faculty of Brain Sciences, UCL); Andrea Dohmen (ESRC Post-Doctoral Fellowship, based at the University of Oxford); Neil O'Leary (post-doctoral fellowship, Dalhousie University, Canada); Ben Jennings (Research Fellowship, University of Montreal, Canada); Alessandro Tomassini (Research Fellowship, Institute of Neurology, UCL); Kamila Polisenska (Lectureship, University of Manchester); Nicki Thomas (Senior Lecturer, London South Bank University); Moira Graham (Lecturer in Public Health, University of Hull); Matilda O'Neill-Biba and Joy Myint (Lecturers, Anglia Ruskin University); Franziska Rauscher (Lecturer in Ophthalmology, University of Leipzig, Germany); Caroline Dowsett (Lead Nurse Consultant, Tower Hamlets Primary Care Trust); and Catherine Wilson (Clinical leader and educator, Royal Marsden NHS Foundation Trust).

d. Income, infrastructure and facilities

The School enjoys collaborative research relationships at a national level (e.g., UCL, Imperial College London, King's College London, University of Oxford) and an international level (e.g., University of Melbourne, Australia; National University of Singapore, Singapore; Northeastern University, USA; Technical University of Berlin, Germany; University of Brunei, Brunei; and University of California at San Francisco, USA). Examples include Professor Newman's collaborative grant with Professor Osborne and the University of Melbourne, funded by the Victoria Department of Health (AUS \$140,000) to develop an e-health intervention; a study funded by the European Union bringing together a consortium of five groups across Europe including City University London and led by Phillips Healthcare (€1,600,000); and Professor Francis' collaborative bid with Dr S. Stanworth (John Radcliffe Hospital, Oxford) and Professor R. Foy, University of Leeds (NIHR £1,983,232).

Sponsorship for recent student research has been obtained through donations from, for example, the Clothworker Fund (£147,000 optometry and £150,000 nursing), Qinetiq (£38,400) and Max-Planck in Germany (€6,000).

Our investment in our infrastructure has allowed the majority of our staff to move into a single building, with all staff due to move to that space by the middle of 2014. This physical proximity is designed to promote interdisciplinary research activity and develop a close research community. Funding of over £700,000 from the University has been used to refurbish laboratories used in Optometry, Nursing and Language and Communication Sciences and to purchase additional equipment for those disciplines, together with Radiography and Midwifery. To cite one example of our outstanding research facilities, the Optometry laboratories house equipment for the production and evaluation of histological sections (ultramicrotomes, cryostat, vibratome, light microscopes and image analysis suit); rig for intracellular electrophysiological recording and microinjection; a Tissue Culture Laboratory; a specialist husbandry system for housing amphibian specialist eye movement equipment; and a fish and biochemical laboratory.

In addition to its investment in the estate, the University is also investing £35M in Information Technology. A substantial part of this investment includes support for research including increased capacity for complex statistical programmes (e.g., multiple imputation, multilevel modelling), electronic journals and improved performance and support for desktop computing.

The School of Health Sciences Research Governance Policy covers the regulation, monitoring and quality assurance of all research projects (undergraduate, postgraduate or staff) which involve human research participants or their data (detailed guidance and procedures are available from the SHS Research Governance Web Pages: www.city.ac.uk/health/research/research-governance) in conjunction with the City University London Framework for Good Practice in Research. All research projects are subject to ethical scrutiny by the School's Research Ethics Committee (REC), the University REC or the National Research Ethics Service (for projects involving NHS patients and their data). This includes ethical considerations such as risk, confidentiality and consent as well as aspects of the scientific design of studies. The process is supported through guidance and procedures on the School's website, drop in advice sessions from the Chair of the School's REC and open training sessions covering research governance and ethical approval.

e. Collaboration and contribution to the discipline or research base

All Research Centres have made contributions to the wider research base through a range of initiatives and collaborations. For example, the Centre for Language and Communication Sciences Research has exploited expertise within the University, specifically in the Centre for Human Computer Interaction Design, to investigate the use of technology in aphasia therapy. The GReAT Project (Gesture Recognition in Aphasia Therapy), funded by the EPSRC (£297,000), created a novel computerised gesture therapy tool for people with severe aphasia, while the EVA Project, funded by the Stroke Association (£204,898), is creating a virtual communication environment for people with aphasia that aims to enhance communication and reduce social isolation. The Centre also sustains significant collaborations with other institutions: for example, the ESRC-funded DCAL partnership with UCL has stimulated ground-breaking studies into the development of sign language in deaf children and acquired disorders of signing, such as the Deaf and Dementia project, funded by the Alzheimers Society (£197,716) and led by the University of Manchester, UCL and City. Other collaborations with the University of Manchester have generated significant new insights into the long-term consequences of developmental language disorders (e.g., Specific Language Impairment and Adulthood, ESRC, £998,000). International collaborations include the investigation of aphasia and speech and language therapy for aphasia in Greece (Greek Ministry for Education and Lifelong Learning, Thalys call, €600,000); and partnership in EU-funded Cooperation in Science and Technology (COST) Actions. One such action: 'Language Impairment in a Multilingual Society: Linguistic Patterns and the Road to Assessment' (2009-13) involved partnerships with eight European countries in the development of clinical assessments across a range of languages.

The Health Services Research Centre has links with the University of Melbourne, Australia; Shanghai Jiaotong University, China; University of Toronto, Canada; National Autonomous University of Mexico, Mexico; and University of California San Diego, USA in the development of a tool to assess recovery from surgery and anaesthesia; with the National University of Singapore, Singapore and the Singapore National Kidney Foundation for work on End Stage Renal Disease (£300,000); with Deakin University Melbourne, Australia on developments to assess parents' response to childhood Juvenile Arthritis Treatment; with University of Oxford, Imperial College London, University of Manchester, LSE and the Nuffield Trust on telehealth and telecare (£5M);

with King's and LSE on telecare to assist people with and carers of dementia (£1.2M); and with the Institute of Child Health to assess the impact of treatment in Juvenile arthritis (£1.2M).

Alongside research collaborations such as those detailed above, research and academic staff contribute to the discipline through keynote presentations at national and international conferences in the disciplines of Language and Communication Science, Mental Health, Midwifery, Nursing, Optometry and Health Service Management. For example Professor Newman was invited to deliver the keynote address at the Kings Fund Telehealth and Telecare Conference and the Telecare Services Association Conference in 2013; and Professor Simpson delivered the keynote address on evidence-based practice and street-level bureaucracy at the 18th Annual NAPICU Conference, University of Keele in 2013. In addition, Language and Communication Science aphasia researchers have developed the stroke and aphasia quality of life scale (SAQOL-39) which has informed National Clinical Guidelines for Stroke (RCP, 2008) and is now widely used to assess quality of life in stroke patients throughout the world.

The Health Services Research Centre has provided research on telehealth and telecare to shape new government policy on the provision of these services. The Centre has advised the New Zealand Ministry of Health; contributed to European policy through meeting with the European Commissioner for Health and Consumer Policy; provided advice to the Danish Society for Clinical Telemedicine and the Danish eHealth Observatory; delivered a Masterclass to the Stichting Zorg Binnen Bereik (Care Within Reach Foundation) in the Netherlands; and consulted with industry in Europe and the USA. The tool the group has developed to assess outcome from surgery and anaesthesia (PQRS Anaesthesia 2010) has been adopted as the quality outcome measure by the European Society of Anaesthesia (www.pqrsonline.org). The group has undertaken research on the impact of surgery on the brain that has led to radical changes in equipment and practice of cardiac surgery resulting in significant outcome improvements.

Participation in peer review processes

Academic and research staff in the School sit on panels and committees of prominent grant-awarding bodies including the Research Councils (MRC and ESRC), the National Science Foundation and National Institutes of Health (NIH) (USA), various NIHR Research Committees, the Chief Scientist Office for Scotland and Barts Health Charitable Foundation. In addition they review grants for the NIHR Programme Grants for Applied Research and the NIHR Service Delivery and Organisation, the Medical Research Council, Wellcome Foundation, Bupa Foundation, the Health Foundation, the Stroke Association, Parkinson Disease Association, Multiple Sclerosis Society, Ataxia, UK, the Hong Kong Government, the NIH, the National Institutes for Health and Care Excellence (for Infection Control) and the Irish Nursing Board.

Fellowship and relevant awards

Fellowships and other relevant awards have included: Dr J. Verhoeven, Fellow of the Advanced Studies Institute of the Royal Flemish Academy of Belgium for Sciences and Arts, January to June 2012; Dr W. Mann, Marie Curie Fellowship, €245,000, 2011-2014; and Professor Morgan FRS, Wellcome Trust Book Prize for medical writing, 2009. Professor Barbur has won several fellowships and awards: MRC Travelling Fellowship for vision research at the University of California San Francisco; the Japanese Society for the Promotion of Science Fellowship for collaborative research, 2013; the Albrecht-Ludwig-Berblinger Prize of the German Academy of Aviation & Medicine for contribution to occupational medicine, 2011; the Arnold D. Turtle Award from the Association of Space & Environmental Medicine, 2009; and the Walsh-Weston Award from the Society for Lighting Research & Technology for contributions to understanding mesopic vision, 2008. Each of these awards recognised distinguished achievement in research and a significant contribution to national and international practice and policy formulation.

Journal Editorships and Editorial Boards

Researchers in the School hold editorial positions on many journals, including: *Journal of Neurology*, *British Journal of Health Psychology*, *Arthritis and Rheumatism*, *ISRN Geriatrics*, *BMC International Health & Human Rights*, *International Journal of Ophthalmic Practice*, *Perception*, *International Journal of Language and Communication Disorders*, *British Journal of Educational Psychology*, *British Journal of Developmental Psychology*, *BMC Ophthalmology and Ophthalmic and Physiological Optics*, *Gender and Language*, *Anthropology in Action*, *Aphasiology* and *Journal of Deaf Studies and Education*.

Effective Academic Collaboration

All Research Centres engage in national and international academic collaboration and the

effectiveness of our approach is demonstrated by the number of peer reviewed research papers that involve collaborators outside of the School. Some examples of effective international collaboration include:

Language and Communication Sciences Centre with Dr E. Haman (University of Warsaw, Poland), Dr Z. Wodniecka (Jagiellonian University, Poland), Dr I. Dabašinskienė (Vytautas Magnus University, Lithuania), Professor S. Kunnari (University of Oulu, Finland), Prof H. Grech (University of Malta, Malta), Prof S. Armon-Lotem (Bar Ilan University, Israel), Dr S. Ferré (Université François-Rabelais, France), Dr A. Grimm (Goethe University, Germany).

The Health Services Research Centre with Professor S. Green (Monash University, Australia); Dr I. Seppelt (George Institute of Global Health, Australia); Professor A. Marshall (Griffith University, Australia); Professor M. Elovainio (University of Helsinki, Finland); Professors J. Grimshaw, J. Brehaut, L. Lémyre and B. Wilson (University of Ottawa, Canada); Professor W. Moyle, (Griffith University, Australia); Professors F. Légaré and G. Godin (Université Laval Quebec, Canada); Professor M. Kirkevold (University of Oslo, Norway); Dr D. Evans (University of South Australia, Australia); Professor C. Royse (University of Melbourne, Australia); Professor R. Osborne (Deakin University, Australia); Professor L. Sundermacher (Ludwig Maximilian University and Technical University Berlin, Germany); Professor E. Howard and Dr C. Castaneda Sceppa (Northeastern University, USA).

The Maternal and Child Health Research Centre with Dr J. Zeitlin (INSERM, France); Dr A. Mohangoo and Dr K. van der Pal (TNO Child Health, The Netherlands); Professor S. Alexander (Université Libre de Bruxelles, Belgium); Prof M. Gissler (University of Copenhagen, Denmark); Dr K. Szamotulska (Institute for Mother and Child, Poland).

The Public Health Research Centre with Professor S. Green (Monash University, Australia); Dr I. Seppelt (George Institute of Global Health, Australia); Professor A. Marshall (Griffith University, Australia); Professor M. Elovainio (University of Helsinki, Finland); Professors J. Grimshaw, J. Brehaut, L. Lémyre and B. Wilson (University of Ottawa, Canada); Professors F. Légaré and G. Godin (Université Laval Quebec, Canada); Professor B. Cuthbertson and Dr Rose (University of Toronto, Canada); Professor C. Weijer (University of Western Ontario, Canada).

Collaboration or integration with external bodies

The following examples illustrate how collaboration and integration with external bodies, including NHS Research and Development, industry and government agencies, takes place within the School: Dr Haddad's collaborative work with the National Institute of Clinical Excellence Guidelines Development Group in which CG 91 (covering the treatment and management of depression in adults with chronic physical health problems) was developed; Professor Simpson's work with the Research Strategy Committee for the East London NHS Foundation Trust in which a formal strategy for mental health research has been developed and implemented and his work as the Chair of Mental Health Nurse Academics (UK) in which representatives from all UK higher education institutions join together to influence mental health nursing education and research. Professor Simpson also chairs the Steering Committee for the International Network of Psychiatric Nursing Research (NPNR), the premier UK research conference for mental health and psychiatric nursing research. This is run jointly by the Royal College of Nursing and Mental Health Nurse Academics (UK). Professor Newman was Chair (2008/09) and Deputy Chair (2009/10) of the Division of Health Psychology of the British Psychological Society. Professor Francis and Professor Newman are on the Executive of UCL Partners and are involved in the Academic Health Sciences Centre of that body, which aims to translate cutting-edge research and innovation into measureable health and wealth gains for patients and populations in London, across the UK and globally.

Responsiveness to National and International Priorities and Initiatives

Academic researchers from the School were invited to present research evidence on in-patient care and mental health nursing to the 2012 Schizophrenia Commission and contributed to the interdisciplinary Mental Health Qualitative Research Network, jointly hosted by the Royal College of Psychiatrists and Rethink. In response to the pressures of an ageing population Professor Meyer has been appointed to a high-profile new Commission which aims to develop a vision for residential care in the UK. The Commission on Residential Care, which is hosted by Britain's leading cross-party think-tank Demos, will be chaired by former Care Services Minister Paul Burstow MP.

The Health Services Research Centre responded to the UK Government's need to assess the role

of telehealth and telecare and led a consortium of universities to tackle this issue in a £5M study. As a consequence Professor Newman has briefed civil servants and industry leading the 3 Million Lives campaign and has also briefed Paul Burstow MP and Jeremy Hunt, Secretary of State for Health, as well as the Commissioner in Brussels. In response to the anaesthesia community's identified priority for improvement in patient recovery from surgery and anaesthesia, Professor Newman as Co-PI with Professor C. Royse (University of Melbourne, Australia) and Dr D. Wilkinson (St Bartholomew's Hospital, London) developed a tool (the PQRS tool) to monitor and improve outcomes following surgery and anaesthesia from a grant awarded by Baxter Healthcare.

Effective Mechanisms to Promote Collaborative Research Nationally and Internationally within the Academic Community, Industry and/or the Public Sector

Mechanisms employed to promote collaborative research nationally and internationally have included: the Language and Communication Sciences Centre running a vibrant programme of research events, including the ESRC Festival of Social Sciences events annually (2008 – 2013), the Winter lecture of the *International Journal of Language and Communication Disorders* (2012 and 2013) and major conferences and seminars. In 2011 the latter included: 'Lost for Words, Lost for Life', a major conference about children with speech, language and communication needs, and in 2012 the British Aphasiology Society Therapy Symposium and the Deaf Children's Development Conference. These events involve high-level researchers from the UK and overseas and promote engagement with colleagues in practice and policy-makers. The Therapy Symposium and Lost for Words conference were each attended by over 150 practicing clinicians; and Lost for Words attracted senior policy-makers including the Speaker of the House of Commons.

We encourage collaborative work with the third sector. Examples include the longstanding relationship with Age UK link and support for the work of Professor Meyer in the Quality of Care for Older people Research Group. Another example from the Applied Vision Research Centre is our collaboration with the Fight for Sight Charity, support for Professor Crabb's work on Glaucoma and the International Glaucoma association work with Professor C. Cox on Expert Patient Programme on chronic open angle glaucoma. The School's collaborative mechanisms also place a strong emphasis on user involvement. For example, the Mental Health Research Centre hosts the Service User (and Carer) Group Advising Research (SUGAR). This group meets monthly with external partners to present research findings and secure feedback. Service users also collaborate in research projects (e.g., the NIHR Collaborative Care Planning Research). In addition, close links with key user organisations such as AFASIC and ICAN (both organisations that support parents and represent children and young people with speech, language and communication needs) and the Stroke Association have been fostered. The School's research and academic staff have presented to the co-ordinators of the Stroke Association London Groups and have hosted a research dissemination day for stroke group members. User organisations are active partners on many research projects. For example, the Stroke Association partnered the GReAT project which developed a gesture therapy tool for people with aphasia.

To promote research collaboration staff publications are disseminated through the University's digital repository, City Research Online. Both information promoted via the School webpages and research publications have led to approaches from researchers from a variety of universities to collaborate in research.