

<p><b>Institution: University of Nottingham</b></p>
<p><b>Unit of Assessment: UOA 2 Public Health, Health Services and Primary Care</b></p>
<p><b>a. Overview</b></p> <p>UOA2 comprises the <a href="#">Division of Epidemiology and Public Health</a> (DEPH) and <a href="#">Division of Primary Care</a> (DPC), situated within the School of Community Health Sciences (SCHS) until July 2013 and subsequently within the newly formed <a href="#">School of Medicine</a> (SoM) at the University of Nottingham. Both Divisions have had major research success in the current REF period, with substantial research grant income awarded (total £101 million: DPC £51 million, DEPH £29 million and £21 million in joint work); and over 750 original peer-reviewed publications (DPC 343, DEPH 388, joint 38), including 185 (DPC 48, DEPH 134, joint 3) in journals with impact factors &gt;5. The UOA's success has attracted increased University investment in academic posts (26 returners in RAE2008; 35 in REF2014). Sustainability has been enhanced by success in research capacity building awards for studentships and fellowships (30 in REF period) and increased postgraduate research students (PGRs) (79 PhD new registrations in this REF period). The UOA's research has impacted on patient care and public health enabling important changes in policy and practice, as highlighted in our impact case studies. Our interdisciplinary research groups benefit from sharing methodological expertise and collaboration within and between DPC and DEPH and are described below.</p> <p><b>b. Research strategy</b></p> <p><b><i>Achievement of strategic aims for research during the assessment period</i></b></p> <p>Both Divisions achieved the strategic aims advanced in RAE2008; in particular both have substantially increased research income. DPC research groups have grown and developed, with the value of research awards increasing five-fold (particularly National Institute for Health Research (NIHR) programme grants and Health Technology Assessment (HTA) awards), enhanced research capacity in new senior academic posts, more research-oriented clinical lecturer training posts and nationally competitive career-development fellowships. High impact research publications led to key changes in health care as described in our impact case studies and template. DEPH has relocated to a new purpose built centre, co-locating research and postgraduate teaching, built on its highly successful Masters of Public Health with new Masters courses in Epidemiology and International Health, successfully developed its research portfolio in health protection and infectious disease epidemiology, and substantially increased the number of PGRs (31 new registrations in previous assessment period to 54 in current) with high retention following graduation. Both Divisions have achieved major expansion and innovation in linkage and use of e-health databases for research priority areas including cardiovascular disease, cancer, diabetes, obesity, dietary change, smoking prevention and alcohol misuse.</p> <p><b><i>Significant changes to research environment over the assessment period</i></b></p> <p>Both Divisions have enhanced sustainability by substantial growth in senior academic staff (DPC), middle and junior grade academics (DEPH), PGR studentships and capacity building awards. They have strengthened national and international collaborations, leading to major funding success for multicentre research. Research income has greatly increased through attracting significant centre, unit, National School and Collaboration for Leadership in Applied Research in Health Care (CLARHC) funding (DEPH: UK Centre for Tobacco Control Studies (UKCTCS; renewed as UKCTAS to include alcohol research), NIHR Respiratory Biomedical Research Unit; DPC: NIHR School for Primary Care Research (SPCR), NIHR Patient Safety Translational Research Centre for Primary Care, CLARHC-NDL). In addition both Divisions have been awarded substantial NIHR programme grant and HTA awards. Research publications have increased, in particular those in high impact journals in DPC. The UOA's work has increasingly impacted on national and international health policy and practice as demonstrated in the impact case studies. Specific details on publications, staffing, PGRs, income and collaborations are given below.</p> <p><b><i>Future strategic aims and goals</i></b></p> <p>Both Divisions aim to ensure sustainability and vitality of research over the next 5 years by:</p> <ul style="list-style-type: none"> <li>• further enhancing a thriving research culture by effective staff recruitment, development and retention; high quality supervision of PGRs, mentoring and facilitating a supportive,</li> </ul>

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intellectually challenging working environment conducive to high quality academic endeavour and collaboration

- exploiting opportunities from membership of the new SoM for research infrastructure support, pump-priming and PGR funding, collaborations across the primary-secondary care interface, knowledge exchange and enhancing impact
- attracting increased funding for PGR studentships, postdoctoral fellowships and clinical academic training posts
- increasing investment in early and mid career researchers to generate academic public health, epidemiology and primary care capacity for the future
- continuing to secure major long-term funding e.g. NIHR programme and centre grants and securing second-round NIHR CLARHC funding
- successfully completing major funded research (multi-centre RCTs, programme grants)
- building on the new Clinical Trials Unit (CTU) Chair appointment by maximising opportunities for undertaking primary care and community based RCTs
- enhancing e-health database infrastructure and linkage
- implementing the impact strategy (see impact template)

In addition the DPC aims to maintain membership of the SPCR, strengthen highly successful collaborations between research groups, other primary care divisions of SPCR, and communities of interest including service users and providers through NIHR CLARHC and Academic Health Science Networks. DEPH additionally aims to consolidate UKCTCS growth and development, expanding its role to address harmful alcohol use, and to consolidate the rapid growth of the Health Protection research group and broaden its research footprint to include non-respiratory infections.

**Research groups**

Tobacco control (DEPH: Agboola, Britton, Grainge, Langley, Leonardi-Bee, Lewis, McKeever, Murray, Ratschen, Szatkowski, Venn; DPC: Coleman).

The UKCTCS, a Nottingham-led strategic partnership of 9 UK university research groups, was established as one of five Public Health Research Centres of Excellence with £4.7 million funding from the UK Clinical Research Collaboration (UKCRC) in 2008. Its five year remit was to become a leading international centre of tobacco research and policy excellence; deliver a comprehensive portfolio of interdisciplinary work in national and global tobacco control activity to reduce tobacco related disease and disability; and become a major international focus for training and development of health professionals, policymakers, advocates and others in tobacco control science and practice. UKCTCS research aims to reduce tobacco-related harm by preventing uptake, promoting cessation, developing harm reduction strategies for smokers, and scientific and public engagement to promote findings to users and policymakers. By 2013 the Nottingham group had attracted over £15.5 million in new research grants, published over 130 peer-reviewed papers, including the world's largest trial on nicotine replacement therapy in pregnancy published in the New England Journal of Medicine, and achieved major developments in clinical interventions and smoking prevention policy in the UK and internationally. The group's work on secondary care cessation services strongly influenced the content of 2013 NICE guidelines. Renewal funding of £4.3 million (until 2018) was awarded in 2013, extending the remit to become the UK Centre for Tobacco and Alcohol Studies (UKCTAS) and increasing the number of research groups involved to 13.

Clinical epidemiology

Our clinical epidemiology research spanning multiple disease areas has impacted substantially on healthcare policy and is internationally renowned in several areas (primary care, respiratory, gastrointestinal). Particular methodological strengths are development and use of large e-health databases (QResearch, The Health Improvement Network (THIN), the Clinical Practice Research Datalink (CPRD) and Hospital Episode Statistics (HES)), and conduct of cohort studies in developing countries and meta-analyses. Our clinical epidemiology groups comprise:

- Primary care (DPC: Coupland, Hippisley-Cox, Vinogradova)

This group focuses on the epidemiology of diabetes, heart disease, cancer, osteoporosis and development and validation of risk prediction algorithms. Extensive use is made of the QResearch database, developed by Hippisley-Cox, which is one of the largest primary care databases worldwide, containing longitudinal data from more than 700 UK practices. Over this REF period the

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group has received research awards totalling £6 million and published more than 40 peer-reviewed publications. These have directly influenced government policy and national guidelines e.g. risk prediction algorithms for cardiovascular disease (QRISK2), diabetes (QDiabetes), fracture (QFracture) and for a range of cancers; inclusion of a number of these in NICE and Department of Health (DH) guidelines and in the GP Quality and Outcomes Framework. The DH and Macmillan Cancer Support are piloting the group's cancer algorithms within early cancer diagnosis initiatives. The group has also undertaken important studies quantifying risks and benefits of commonly prescribed drugs (antidepressants, statins, antipsychotics, NSAIDs, Cox-2 inhibitors).

- Respiratory epidemiology (DEPH: Britton, Fogarty, Hubbard, Lewis, McKeever, Szatkowski, Tata, Venn)

This group focuses on aetiology and natural history of asthma/allergic disease, idiopathic pulmonary fibrosis, lung cancer, cystic fibrosis and hereditary telangiectasia and delivery of lung cancer care, using e-health databases and collection of original data. Much of the group's research in this REF period was conducted as part of the Nottingham Respiratory Biomedical Research Unit (£6.1 million), with other grant income exceeding £6 million, and over 90 peer-reviewed publications. Major contributions to the evidence base include cohort and cross-sectional studies in developing countries exploring the role of parasites in asthma, meta-analyses and the first RCTs of experimental hookworm infection in allergic disease. Other major contributions include studies of the role of paracetamol on risk of asthma and allergy; the effect of a pro-thrombotic state on risk of idiopathic pulmonary fibrosis; factors associated with survival of cystic fibrosis patients, and exploration of biomarkers for predicting prognosis. Work on lung cancer care pathways and variation in access to treatment has guided national service planning.

- Gastrointestinal epidemiology (DEPH: Card, Crooks, Fleming, Grainge, Tata, West)

This group is one of the UK's leading gastrointestinal epidemiology research groups describing the epidemiology, aetiology and outcomes for acute and chronic gastrointestinal disease. The group makes extensive use of e-health databases (CPRD, THIN, HES) and in this REF period has published over 60 peer-reviewed publications, and been awarded research grants totalling £1.3 million and senior fellowship funding of £840,000. Major contributions include evidence on the risk of venous thromboembolism in inflammatory bowel disease, the occurrence and consequences of diverticular disease, and work in the field of liver disease, coeliac disease and gastrointestinal bleeding. This has informed national (British Society of Gastroenterology, NICE) and international (American Association for the Study of Liver Disease) guidelines on management of coeliac disease, inflammatory bowel disease, acute upper GI bleeding and primary biliary cirrhosis.

- Cancer epidemiology (DEPH: Card, Crooks, Grainge, Hubbard, Leonardi-Bee, Tata, West)

This group studies cancer aetiology, early detection and outcomes. Research includes the use of linked e-health data (primary care, secondary care (HES) and cancer registry via the CPRD) to quantify venous thromboembolism risk in cancer; a large clinical trial (ukCAP) and subsequent meta-analyses of aspirin and folic acid for preventing recurrence of colorectal adenomas; the use of THIN to study the epidemiology of non-melanoma skin cancer; and linkage of THIN with geochemical data from the British Geological Survey Unit to quantify cancer risk associated with environmental metals. The group collaborates with the Respiratory group using National Lung Cancer Audit data to predict surgery and chemotherapy associated mortality and identify factors to aid early detection of lung cancer, and also with the Gastrointestinal group through sharing e-health database methodology and quantifying malignancy risk associated with gastrointestinal diseases such as cirrhosis and coeliac disease. The group has published 70 peer-reviewed publications and achieved research awards totalling £2.7 million in this REF period (includes some overlap with respiratory and gastrointestinal group figures above).

- Medicine safety and effective healthcare (DPC: Avery, Armstrong, Coupland, Kendrick, Kai, Montgomery, Schedlbauer, Vedhara, Vinogradova; DEPH Lewis,)

This group's work identifies the prevalence, nature and causes of prescribing problems in primary care, and develops and evaluates interventions to improve safety and effectiveness of medicines and other healthcare interventions. The group has developed substantially since RAE2008 with research awards with a total value of £24 million and 122 peer-reviewed publications. Major contributions include an RCT (PINCER) demonstrating effectiveness of a pharmacist-led intervention in reducing prescribing errors in primary care; studies of patient reported adverse drug reactions to the UK Yellow card Scheme which informed EU policy and the most comprehensive

study to date on primary care prescribing errors which changed DH policy and the Membership of the Royal College of General Practitioners curriculum. The group's world largest RCT of medical treatments for heavy menstrual bleeding in primary care (ECLIPSE) has changed clinical recommendations globally. Current work includes two programme grants, one evaluating the effect of healthcare on medical crises in older people and the second evaluating effectiveness of ePrescribing systems and two major mental health trials in Nigeria, which are the largest trials of their type ever conducted in Africa. The new Chair in Health Psychology is enabling the examination of biopsychosocial factors in determining effectiveness of healthcare across a range of disease contexts (e.g. diabetes, vaccinations, cancer detection) and developing psychological interventions to optimise health and healthcare. The appointment of a Chair in the CTU with extensive primary care trials expertise is key to further development of trial methodology and conduct within DPC and the University.

Health Protection and Infectious Disease Epidemiology (DEPH: Beck, Myles, Nguyen-Van-Tam, Puleston)

Established in 2007, this group is already one of the UK's leading Health Protection groups. Its work on influenza in particular, is internationally recognised. The group became a World Health Organisation (WHO) Collaborating Centre for pandemic influenza in 2010 and Faculty of Public Health 'national treasure' training location in 2011. The group works closely with the UK Health Protection Agency (HPA; now Public Health England) at local and national level. It focuses on epidemiological work at the interface with clinical practice and public health policy, use of e-health databases, systematic reviews and meta-analyses. The group has published over 50 peer-reviewed publications and secured research awards totalling £8.5 million. Major outputs quantify risk of severe outcomes in hospitalized patients with influenza, benefits of maternal vaccination against influenza, effectiveness of pandemic vaccines, influenza virus shedding and environmental survival, antiviral drug effectiveness, and the first quarantine based human influenza challenge-transmission study. The group's work has fed directly into UK government pandemic preparedness and response. Systematic reviews and meta-analyses commissioned by WHO fed into its international guidelines for influenza preparedness, clinical management and prevention.

Injury epidemiology and prevention (DPC: Coupland, Kendrick, Orton, Vinogradova)

This group is the UK's leading child unintentional injury prevention research group. Its work evaluates interventions to prevent injury through the use of RCTs and systematic reviews and in this REF period, the group have published 51 peer-reviewed publications and secured research grants totalling more than £6 million. Since RAE2008 the group has developed to include injury epidemiology and prevention spanning all ages and has developed a programme of e-health database research. Major contributions include RCTs and economic evaluations (thermostatic mixer valves to reduce bath water scalds in childhood; bed and chair pressure sensors to reduce falls in older hospital in-patients; day hospital intervention to reduce falls in older people), the largest UK longitudinal study of the longer term outcomes of injury (the UK Burden of Injury Study), the first use of network meta-analysis to allow simultaneous comparison of all evaluated interventions for preventing injuries and 7 Cochrane reviews (4 published, 3 on-going). The group's work informed NICE guidelines on the prevention of unintentional injuries to children and young people and the WHO's report on child and adolescent injury prevention.

Applied genetics and ethnicity (DPC: Armstrong, Coupland, Kai, Kendrick, Qureshi)

This group developed from integration of the ethnicity and genetics groups planned in RAE2008. Work focuses on common chronic diseases and inherited disorders showing major ethnic and social variations. Over this REF period the group has published 25 peer-reviewed papers (5 in journals with impact factor >5) and attracted funding of over £3 million. It developed and tested new approaches to family history risk assessment for cancer and cardiovascular disease in primary care (ADDFAM trial) with international impact. Work on diverse ethnic patient experience and screening for haemoglobin disorders changed the National Screening Committee's antenatal and newborn genetic screening programmes, informed mandatory NHS training on universal genetic screening and current debate about preconception genetic risk testing. The group's work has informed health policy internationally, including NICE guidelines (familial hypercholesterolaemia; breast cancer; lipid modification) and the National Institute of Health's consensus statement on

family history use in US health care.

**Research without visible output in REF2014 or income partially recognised in REF 4b/c**

The DPC has been a member of the SPCR since 2009, but outputs from major studies will not be visible until the next REF period. This is also the case for outputs from the Translational Research Centre for Patient Safety in Primary Care, from the UKCTAS award, from the majority of NIHR programme grants and from at least 19 large (>£500,000) funded studies (DPC 13, DEPH 4, joint 2). Members of the UOA are chief investigators, principal investigators or co-applicants on 7 NIHR programme grants (DPC 2, DEPH, 2, joint 3) totalling more than £12.4 million. These prestigious awards, held within NHS Trusts do not allow full economic costing, hence only a small proportion of their value will be included in research income figures in REF 4b/c; this also applies to the recent UKCTAS award. In addition a number of major recent awards (>£500,000) will only be partly reflected in research income figures as research spend is yet to accrue on these (the UKCTAS award, 4 programme grants and 7 other studies).

**c. People, including:**

**i. Staffing strategy and staff development**

**Overview**

Attracting, developing and retaining gifted academics is central to our research strategy and both Divisions have been successful during this REF period, with University strategic investment leading to substantial development. The DPC achieved significant senior academic expansion (7 Professors, 1 Associate Professor (AP)/Reader, 2 APs vs. 4 Professors, 1 AP/Reader and 3 APs in RAE2008). New posts within DPC in health psychology (chair), economics (AP) and public health (lecturer) have enhanced collaborative interdisciplinary working. A recent new Chair appointment to the CTU, with expertise in primary care based trials further enhances DPCs strengths in this area. The DEPH has increased junior and middle grade academic posts (increase of 11 lecturers and APs) enabling capacity building and career progression of promising early career academics. The number of academic staff returned in REF2014 has increased compared to RAE2008 (DPC: 13 vs. 7; DEPH: 22 vs. 19). Our staff are based on two sites; DPC at the University/University Hospital campus, and DEPH at the City Hospital site, with senior clinical academics delivering NHS services in general practice, clinical medicine or with the HPA/Public Health England. We maximise opportunities for contact and communication between the sites by regular joint divisional research seminars and epidemiological methods group meetings, as well as a range of other activities including research away days, individual research group meetings and journal clubs, and social events.

**Maximising sustainability through effective staff recruitment and retention**

We have attracted and retained high quality staff with Divisional expansion as described above. In addition, the DPC has increased early career posts further boosting critical mass and enabling succession planning (2 non-clinical NIHR/SPCR post-doctoral fellowships, 2 clinical NIHR doctoral awards, 4 NIHR academic clinical fellowships and 1 NIHR in-practice fellowship). The DPC also hosts academic attachments for doctors in training (FY2 and GP registrars), with post holders subsequently obtaining a clinical lectureship and 2 academic clinical fellowships in this REF period. The DEPH has invested in a clinical AP, a lecturer in public health and a lecturer in health economics, created a post to retain a clinical AP in epidemiology and 2 staff members have obtained early career fellowship awards. DEPH has also had significant success in capacity building awards (22). Both Divisions host training posts for specialist trainees in public health, 3 of which have led to academic appointments within DEPH and one to an academic appointment in DPC.

**Enhancing career development through personal development and mentoring**

Both Divisions prioritise researchers reaching their full potential and developing successful research careers. Annual appraisals, personal development and performance reviews and career planning are provided. Clinical academics have joint NHS/University appraisals. Junior academics and early career researchers have mentors providing regular support, learning and career development opportunities. Staff are encouraged to engage with the Graduate School's extensive research training programme, divisional seminars, Master's degree modules and the East Midlands Research and Design Service (RDS) training. Both Divisions support attendance at external courses and conferences. The University has implemented the Concordat to support researcher development and uses the researcher development framework ([www.vitae.ac.uk](http://www.vitae.ac.uk)) and the SCHS has provided regular promotion workshops. Our successful career development is evidenced by

numerous promotions in this REF period (DPC: 2 Clinical Chairs, 1 Non-clinical Chair, 1 Non-clinical AP/Reader and 1 Senior Research Fellow; DEPH: 3 AP/Readers, 4 APs and 2 Senior Research Fellows).

### ***Creating an effective research environment***

We have created a supportive, intellectually challenging environment conducive to high quality academic endeavour and collaboration, through Divisional and University wide approaches. Both Divisions have strategically developed to increase multi-disciplinarity, providing excellent opportunities for collaborative research, training, mentoring and PGR supervision. Inclusion in strategic research decisions is promoted by regular management group meetings. Research ideas, knowledge and expertise are shared through seminar series, PGR conferences and research away days. We provide research-led teaching on our successful Masters courses (Public Health, Public Health International, and Epidemiology, with an average of 38 Masters students per year and a graduation rate of 93%). We foster informal contacts between Divisional members at social events and by supporting staff attendance at conferences (e.g. national Society for Academic Primary Care Annual Scientific Meetings). We are committed to creating an environment free from discrimination that celebrates and values diversity ([Equality and diversity](#)), and this is underscored in staff inductions. The University has established the Athena Swan WINset committee to ensure equality of opportunity, representation and recognition of women in Science, Engineering, Technology and Medicine and been awarded a Silver Athena Swan award. Staff from both Divisions played leading roles in obtaining a Bronze award for the School of Community Health Sciences and are actively working towards obtaining a Silver award for the SoM.

### ***Successful integration of clinical academics and NHS-employed researchers***

We encourage and support research by NHS researchers, housing some within DPC, and have close research integration with service colleagues in public health, respiratory medicine and gastroenterology. Most clinical, and some non-clinical staff, have joint academic/NHS appointments and enjoy the full range of university research facilities, career development and learning opportunities. NHS researchers attend our research group activities such as journal clubs, seminars and research away days. As a Faculty of Public Health 'national treasure' training location and with its close HPA/Public Health England links, the Health Protection Group receives public health trainees from across the UK and field epidemiology trainees from the HPA.

## **ii. Research students**

### ***Building postgraduate research (PGR) student capacity***

Both Divisions have been successful in attracting PhD students in this REF period (79 new registrations: 25 DPC, 45 DEPH and 9 joint) representing a substantial increase since RAE2008, particularly for DEPH (31 in RAE2008). This has been achieved through success in NIHR, SPCR, Research Councils and University funded doctoral fellowships and studentships. During this REF period, we have supervised 117 PGR students (39 DPC, 67 DEPH, 11 joint) of which 45 are international students and 40 have co-supervisors in other schools reflecting our collaborative work. A total of 47 PGR (13 DPC, 30 DEPH, 4 joint) students have been awarded research doctoral degrees in this REF period.

### ***Fostering a thriving research culture for postgraduate research students (PGRs)***

The University invested in accommodation enabling co-location of PGRs in DPC and DEPH PGRs are co-located in the £4m Clinical Sciences Building which opened in 2009. PGRs are integrated into research groups, contribute to group meetings and journal clubs, and present at divisional seminars, away days and School and Faculty conferences; students in DEPH also run their own seminar series. In addition, the UKCTCS runs an annual PGR conference to promote interaction between students in its member Universities.

### ***Ensuring postgraduate research students achieve their full potential***

PGRs are provided with extensive learning opportunities and support within Divisions, the [SoM](#), the [Faculty of Medicine and Health Sciences](#) (FMHS) and the [Graduate School](#). PGRs can access a wide range of University services ([financial](#), [health](#), [disability](#), [study support](#), [careers advice international](#)). Training needs are identified, and a training plan produced at an early stage of the degree supported by comprehensive and flexible training ([Medicine & Health Sciences Graduate Centre](#) and [University Graduate School](#)), based on the [researcher development framework](#). The DPC and SoM have specific funds supporting PGR attendance at international conferences, courses, and purchase of equipment to facilitate successful degree completion. PGRs have at

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least 2 co-supervisors; full time students have a minimum of 10 recorded supervision meetings per year (part-time students 6). Monitoring of progress is on-going, with formal reviews at the end of years 1 and 2 by an independent internal assessor.

***Supporting and developing staff to provide effective doctoral supervision***

Both divisions have Divisional Postgraduate Advisors supporting PGRs and supervisors. Training is provided for new supervisors by the SCHS and the Graduate School, with mentoring from experienced co-supervisors. The PGR student handbook and the University Quality Manual detail processes and regulations for students and supervisors.

**d. Income, infrastructure and facilities****Research income**

New research grants awarded to members of the UOA in this REF period totalled £101 million (DPC £51 million, DEPH £29 million, joint £21 million), representing a 3.5-fold increase from that achieved in RAE2008 for the combined UOAs 6 (epidemiology and public health; £15 million) and 8 (primary care; £14 million). Particularly significant achievements for DPC include 5 NIHR Programme Grants (£4 million, joint £5.8 million), 11 NIHR HTA awards (£9 million, joint £4 million), an NIHR Collaboration for Leadership in Applied Research in Health Care (CLARHC) (£8 million), a NIHR Patient Safety Translational Research Centre (MATRIC-PCPS) (£6.2 million), 4 EU funded projects (£9.4 million), and awards from the UK Clinical Research Collaboration (£9.1 million) and NHS Connecting for Health (£2.4 million). Membership of the SPCR has increased collaboration with 7 high performing primary care research divisions nationally, involving 18 SPCR studies with a value of £6 million. Particularly significant achievements for DEPH include the NIHR Respiratory Biomedical Research Unit (£6.1 million), 5 NIHR Programme Grants (£2.6 million, joint £5.8 million) and 2 other large NIHR grants (£3.5 million), 4 NIHR HTA awards (£0.5 million, joint £4 million), the UKCRC funded UKCTCS and subsequent renewal (£9.1 million), the US Centers for Disease Control and Prevention funded EMIT study (£6.8 million), 7 Medical Research Council grants (£1.2 million, joint £0.6 million) and 1 Cancer Research UK grant (£1.6 million).

***University infrastructure and investment***

Our research-led University invests heavily in infrastructure to support research, including excellent IT facilities and access to information, research grant support, studentships and fellowships, training and high-quality accommodation. For example, as a result of the DEPH success described above, the University invested £4 million to extend the Clinical Sciences Building for co-location of clinical, epidemiology and policy specialists; as a result of DPC success in RAE2008, membership of the SPCR, increased grant income and divisional expansion the University invested in high quality refurbished accommodation for PGRs. The University attracted £2.5 million from NIHR to co-locate the RDS-East Midlands, Trent Comprehensive Local Research Network (CLRN) and the Nottingham CTU to maximise research support services for DPC and DEPH. The recent appointment of a Chair with extensive primary care trials expertise in the CTU underlines the importance given to primary care based trials within the University. The School of Community Health Sciences provided matched funding for 17 doctoral studentships. The DPCs success in attracting research income resulted in substantial discretionary funds for pump-priming projects, part-funding PhD studentships, and bridging funding.

The DPC's research unit provides induction programmes, funding alerts, literature searches, bibliographic database management, statistical support and assists with grant applications and ethical and NHS research governance approval. It facilitates research skills training, internal peer-review, research away days, a divisional seminar programme and quarterly researcher meetings to review progress, strategy, capacity and training needs. PRIMIS is housed in the DPC and provides expert consultancy and training on primary care data, coding and information management and works with researchers to develop data extraction specifications and extraction and analysis tools for research projects. DEPH has integrated statistics, economics and systematic review expertise by embedding appropriate posts in research teams. A specialist post established in 2008 takes responsibility for all regulatory approvals and research budget planning.

***NIHR School for Primary Care Research (SPCR)***

As a result of the DPC's performance in RAE2008 the DPC joined the [NIHR SPCR](#), which comprises the leading academic primary care centres for England. The SPCR aims to increase the evidence base for primary care practice and has 5 research programmes which the DPCs research

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maps onto. It provides annual competitive funding (£3 million) for primary care studies and capacity building awards for member institutions, plus training opportunities. Strong collaboration between members of the SPCR has developed over the last 4 years.

**Collaborations with service users**

The DPC, worked with Nottinghamshire County Teaching Primary Care Trust to develop, train and provide financial support to a research consumers and service user group. This group provides advice on identifying research questions, through to protocol design, membership of project management teams, undertaking research tasks and dissemination. The UKCTCS has a smokers' panel providing similar input to their work, and works closely with a range of partner organisations in a national tobacco control research network.

**Supporting NHS research**

The DPC houses the East Midlands RDS, one of 10 NIHR funded regional research design services which support researchers to develop and design high quality applied health and social care research proposals. The RDS has expertise in medical statistics, clinical trials, epidemiology, health economics, qualitative research, and public and patient involvement.

**e. Collaboration or contribution to the discipline or research base**

Collaborations of particular note are as follows:

- The research groups in the DPC collaborate closely with other members of the SPCR, which has funded a total of 18 studies with a value of £6 million
- The 9 UKCTCS institutions, expanding to 13 in the UKCTAS, collaborate with each other and also work particularly closely with the Royal College of Physicians (RCP) in the production of authoritative reports on tobacco control policy, with Action on Smoking and Health (ASH) and the Alcohol Health Alliance in tobacco and alcohol policy advocacy, and in the global International Tobacco Control (ITC) and International Alcohol Control (IAC) studies monitoring and promoting tobacco control policy implementation. The Centre has also established a Tobacco Control Research Network of over 150 individuals and 80 organisations working in research, advocacy and practice (<http://www.ukctcs.org/ukctcs/research/trn.aspx>).
- The Respiratory Epidemiology Group has successfully collaborated with Addis Ababa University's School of Public Health, Ethiopia (Drs Davey, Hanlon and Medhin) since 2001, resulting in this REF period in 6 publications and a PhD award. More recently, the group collaborated with the National Institute of Hygiene, Epidemiology and Microbiology in Havana, Cuba (Drs Fernandez and Suarez) resulting in the establishment of a birth cohort supported by the Wellcome Trust.
- The Respiratory/Cancer Epidemiology groups collaborate with the National Cancer intelligence Network and the Roy Castle Lung Cancer Foundation on a research programme using the National Lung Cancer Audit. This has led to 2 awarded PhDs and 3 on-going PhDs, grant income of approximately £0.5 million and 9 publications.
- The Gastrointestinal Epidemiology Group collaborate extensively with leaders in database epidemiology utilising Swedish data (Professor Ludvigsson's group, Karolinska Institute, Sweden) who provide access to these data and expertise, resulting in 4 publications and opportunities for junior members to spend time working at the Institute.
- The Health Protection Group have major and long-standing collaborations with UCL (Dr Hayward) on respiratory virus infections via the EMIT consortium (Nottingham-led) and the COSI and FluWatch consortia (UCL-led) and with the University of Maryland (Prof Milton) on the aerobiology of influenza transmission.
- The Medicines Safety and Effective Healthcare Group collaborate with Harvard, Manchester, Edinburgh, Aberdeen, Birmingham and UCL, leading to grants totalling over £12 million, 23 publications and 5 PhD students in the current REF period.
- The Primary Care Epidemiology Group has collaborations with Public Health England (real time infectious disease surveillance), EMIS (leading supplier of GP computer systems), Bristol University, Queen Mary's University London and EU partners leading to grants totalling more than £6 million and over 40 publications since 2008.
- The Injury Group collaborate with national leaders in injury research (UCL, Swansea, West of England) and in meta and decision analyses (University of Leicester), leading to grants totalling more than £5 million, 20 publications and 4 PhD students in this REF period (see <http://www.miskin-group.org.uk>)

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- Significant collaborations between the Respiratory Epidemiology Group and GlaxoSmithKline (Hubbard is joint funded GSK/British lung foundation chair of respiratory epidemiology).

Our research groups have excellent collaborations with the NHS (e.g. UKCTCS with New Leaf smoking cessation service; the Medicines Safety and Effective Healthcare Group, the Injury Group and the Primary Care Clinical Epidemiology Group with local Primary Care Trusts, Clinical Commissioning Groups, NHS Commissioning Board Local Area Teams and Public Health within Local Authorities; the Applied Genetics and Ethnicity Group with the NHS Screening Committee). Avery chairs the Strategic Management Board of the Primary Care Research Network for the East Midlands and South Yorkshire and is a member of the Trent CLRN Board, and Kai is primary care lead for CLARHC-NDL and East Midlands Academic Health Science Network (AHSN).

UOA members contribute to the discipline through journal editorial roles, membership of funding panels, national guideline development groups, Royal College and other committees, and peer reviewing papers for publication and applications for funding. More specifically, during the REF period, UOA members have been:

- Editor in Chief (*British Journal of Health Psychology*), Associate Editors (*Injury Prevention, Addiction, BMC Family Practice*), Consultant Editor (*Prescriber*), Senior Editor (*Addiction, Influenza and other Respiratory Viruses*), Statistical Editors (*Thorax, Cochrane Skin Group*) and Editorial Board Members (*British Medical Journal, Brain, Behaviour and Immunity, Health Psychology, Alimentary Pharmacology and Therapeutics, International Journal of Pharmacy Practice, Annals of Family Medicine, Journal of Addiction Research and Therapy*).
- On panels for NIHR (Programme Grants for Applied Health Research), Cancer Research UK (Population Research Committee and Post-Doctoral Population Research Fellow Appointments Committee), MRC (Population Health Scientist Fellowship Training and Career Development panels), British Psychological Society Research Board, and the Department of Health, World Health Organization and Wellcome Trust pandemic influenza research committees.
- Chair of the NICE programme development group on smoking cessation in secondary care; members of the NICE guideline development groups for lipid modification, familial breast cancer, public health guidance on strategies to prevent unintentional injuries among children and young people aged under 15, idiopathic pulmonary fibrosis, tobacco harm reduction, and smoking cessation in secondary care; and members of NICE Quality Standards familial hypercholesterolaemia topic expert group and Independent Quality & Outcomes Framework Indicator advisory committee.
- Chair and members of the Royal College of Physicians tobacco advisory group, and national lead on prescribing indicators for the Royal College of General Practitioners
- President elect for the Society for Research on Nicotine and Tobacco Europe
- Members of Department of Health advisory committees on antimicrobial resistance and healthcare associated infection, increasing access to psychological therapies for people with long term conditions and medically unexplained syndromes, and smoking/mental illness.
- Members of ASH Board and Advisory Council, Joint Office for Strategic Co-ordination of Health Research, E-Health Oversight Board, NHS Connecting for Health Research Capability External Reference Group, UK Scientific Pandemic Influenza Committee (SPI) and its subgroup on clinical countermeasures, UK Pandemic Influenza Clinical and Operational Group, Scientific Advisory Group for Emergencies (SAGE), Advisory group on Surveillance for Pandemic Influenza, National Diabetes Public Health Intelligence Group and Commission on Human Medicines Nicotine Containing Products Ad Hoc Group.

UOA members have also received a number of prestigious awards, including a CBE for Britton in 2012, the John Fry Award for GP member or fellow of Royal College of General Practitioners who has promoted the discipline through research and publishing (Avery awarded in 2008 and Hippisley-Cox in 2009), and the Royal Society for the Prevention of Accidents, Distinguished Service Award for Academic Achievement (Kendrick in 2008).