Institution: University of Nottingham

Unit of Assessment: 2

a. Context

The units research, encompassing the Divisions of Primary Care (DPC) and Epidemiology & Public Health (DEPH) impacts on health and welfare, benefiting patients, their families/dependents, and the wider general population to prevent disease or heighten public awareness, typically through changes to health policy and practice by engaging with intermediary non-academic users/ beneficiaries. Tobacco research informed clinical and public health national NICE guidelines on smoking cessation and tobacco harm reduction, MHRA licensing of nicotine products and government policy on point of sale legislation enshrined in the 2011 Tobacco Control Strategy for England. Primary care research led to incorporation of a new vascular risk assessment tool QRISK (*www.qrisk.org*) into more than 90% of UK primary care computer systems, inclusion in the Quality and Outcomes Framework, and increased public awareness of vascular disease risk through the QRISK calculator. This group's research informed NICE guidelines (cardiovascular disease, type 2 diabetes, osteoporotic fracture), and assisted national (Department of Health (DH), Health Protection Agency) management of infectious diseases, natural and chemical disasters through QSurveillance (*www.qsurveillance.org*). Gastrointestinal research informed NICE guidelines on acute upper gastrointestinal bleeding and NHS commissioning services for digestive diseases. Lung cancer research led to National lung cancer audit improvements and the first pan-European lung cancer audit, impacting on patient pathways for diagnosis and equity of access to surgery and chemotherapy. Prescribing errors research affected clinical practice through General Medical Council endorsement of recommendations for GP education and training on safe prescribing. Influenza research informed national (DH) and international (WHO) guidelines and policies for prevention and management to improve preparedness for future pandemics and helped minimise the societal impact of the 2009 pandemic. Injury research informed NICE guidelines to prevent injuries in children and young people, and specific injury prevention measures such as thermostatic mixer valve fitting to prevent scalds in more than 24,000 homes (Glasgow Housing Association http://www.gha.org.uk). Applied Genetics and Ethnicity research informed NICE guidelines on familial breast cancer; the National Screening Committee antenatal and neonatal screening programme; and the development of health policy on family history recording by the US National Institute of Health.

Our research is used by a wide range of charities, NGOs and professional bodies to inform the public about health issues and lobby for health policy changes. A prime example is the work of the UK Centre for Tobacco Control Studies (UKCTCS; led within DEPH), (*www.ukctcs.org/ukctcs/about/smokefreeaction.aspx*) which is supported and utilised by a multitude of national charities and professional bodies.

Commerce has benefitted from our research: QRISK is licensed by all major primary care systems suppliers including EMIS (55% of practices; *www.emis-online.com/qrisk2*) and occupational health/pharmacies such as Wellpoint Ltd (*www.wellpointgroup.com/Kiosk.aspx*); respiratory research has been used by EPIC-CEGEDIM to improve their clinical datasets; and a structured family history questionnaire developed by the Applied Genetics and Ethnicity group has been integrated into FAHRAS (University spin-out) genetics software.

b. Approach to impact

We engage with users at all stages of research from conception, through delivery of the research, dissemination and implementation. The steps we take to maximise impact are outlined below.

1.Strategic approach to impact

Impact is recognised as a core activity underpinning research and teaching, as described in the University Knowledge Exchange (KE) Framework for 2013-18. In addition, DPC (via the CLAHRC-NDL, an NIHR funded health research collaboration with local NHS organisations) and the UKCTCS have benefitted from membership of one of the University's research priorities (*www.nottingham.ac.uk/research/priorities/clinicaltranslationalresearch*).

2. Developing skills in enhancing the impact of our research

Training in research user involvement, KE and dissemination is provided by the Graduate School, the Research Design Service (RDS) for the East Midlands housed in the DPC and by the CLAHRC-NDL, and we share good KE practice in grant applications and in project and research centre dissemination strategies.

3. Resourcing user involvement and knowledge exchange

The unit has benefitted from RDS Research Development Awards, University pump-priming funding and DPC funding for Public and Patient involvement (PPI).

4. Engagement

i) User participation in research

For many years we have sought involvement of patients, the public, service providers and commissioners, health policy developers, industry and the third sector at all stages of the research process. Co-production of research through PPI is facilitated through the RDS and CLAHRC-NDL (www.rds-eastmidlands.nihr.ac.uk/patient-and-public-involvement/). The DPC provided academic leadership, training and funding for the Research Advisors and Volunteers in Nottinghamshire Group (RAVEN) who help identify research questions and collaborate on grant proposals (e.g. the Injury group's NIHR Keeping Children Safe Programme Grant). UKCTCS used has formed a smokers' panel to help develop tobacco research (**Tobacco case study**) (*www.ukctcs.org/ukctcs/research/publicengagement/smokers-panel.aspx*). Notable longstanding collaborations with the third sector include those between UKCTCS and a range of organisations (*www.ukctcs.org/ukctcs/about/advisoryboard.aspx*) and the Injury group with the Child Accident Prevention Trust (*http://capt.org.uk/who-we-are/news/keeping-children-safe-home-project*).

ii) *Uptake of research findings*

Engagement with a wide range of organisations and individuals is key for maximising impact. We have influenced national health policy through work with the UK Government (particularly DH) and supranational health bodies (e.g. WHO) in relation to influenza (**Influenza case study**), tobacco control (**Tobacco case study**), patient safety (**Prescribing errors case study**), environmental and genetic risk identification, screening, and increasing access to psychological therapies for patients with long term conditions. We have also influenced national policy through our work with regulatory bodies (MHRA, GMC (**Prescribing errors case study**)), membership of the Ethics and Confidentiality Committee of the National Information Governance Board, as expert advisors to national bodies (NPSA) and membership of a range of other committees, boards, scientific advisory groups and reference groups. We have influenced Royal College policies by chairing Advisory Groups (**Tobacco case study**) and membership of a range of Royal College Committees. Since 2008 UOA members have chaired and been members of seven NICE Guideline Development Groups (smoking cessation in secondary care, lipid modification, familial breast cancer, familial hypercholesterolaemia, preventing unintentional injuries among children and young people, idiopathic pulmonary fibrosis, tobacco harm reduction) and of the NICE Quality Standards Familial Hypercholesterolaemia Topic Expert Group and the NICE Independent Quality & Outcomes Framework Indicator Advisory Committee. We facilitate staff to undertake these activities by providing time, encouraging staff development in KE skills and through appraisal and personal development and performance review processes.

We work extensively with health care providers and commissioners to translate research findings into practice, with partnerships established for individual research projects (**QRisk case study**) and through the innovative work of CLAHRC-NDL e.g. Research Into Practice People programme (http://www.nottingham.ac.uk/clahrc-ndl-nihr/research/index.aspx). We work with commercial partners (e.g. university spin-out companies (**QRisk case study**)) to develop research findings into innovative health and social care interventions (e.g. computerised prescribing alerts (**Prescribing errors case study**)).

We engage in KE with patients and the public by establishing user groups (e.g. RAVEN group, the UKCTCS smokers panel, NICE Citizens Panel on Tobacco Harm), through existing charities and groups (eg the Injury groups work with the Child Accident Prevention Trust and the Respiratory Groups work with British Lung Foundation Breathe Easy groups), and by making tools developed from our research available to the public online (eg. QRisk calculator).

We work closely with the University Communications team to target communications to user groups and we maintain effective relationships with journalists, politicians and public figures to act as champions to promote our findings (e.g. Steven Williams, chair of the all-party parliamentary group on tobacco) (**Tobacco case study**).

5. Ensuring sustainability of impact

Our staff recruitment and development policies are effective in ensuring future sustainability of the impact of our research with a particular emphasis on recruiting and nurturing early career researchers and postgraduate research students (PGRs). We provide excellent training opportunities through our internationally recognised Masters courses. Our Health Protection Group

is a Faculty of Public Health 'National Treasure' training location (**Influenza case study**) and the UKCTCS provides a range of tobacco control training opportunities (**Tobacco case study**).

c. Strategy and plans

An impact strategy for the new School of Medicine, which includes both Divisions, is being developed, informed by the University KE Framework. This will build on existing, successful KE mechanisms being utilised within UOA2, the School and throughout the University. Senior academics with experience of different KE approaches (e.g. industrial collaboration, improved disease outcomes, influencing health policy, PPI) have been identified to develop the strategy in collaboration with the School Research Committee (SRC). The SRC will monitor and evaluate research impact, identify and disseminate examples of good practice, promote KE and PPI training opportunities, identify funding and resource opportunities for KE and PPI initiatives, advise on developing impact plans for inclusion in grant applications and on data collection for evidencing impact. We will continue to embed impact in annual appraisals and PGR training plans, and staff will be encouraged to participate in KE and PPI training provided through the Graduate School and CLAHRC-NDL and utilise examples of good practice from the Graduate School. KE and PPI skills development will be included in our research seminar series. We will continue to make staff aware of funding and resources for KE and PPI and to use the highly successful methods of engagement for co-design and co-production of research and for training described in section b to ensure sustainability of research impact. The School's impact strategy will include plans for monitoring research impact and routine data collection to evidence and evaluate impact and inform future School strategies for research and impact.

d. Relationship to case studies

Our case studies reflect the diversity of approaches and audiences to enable impact from our work. The **tobacco control** case study highlights co-design and co-production of research with PPI users through the smokers' panel and advocacy groups and extensive engagement with policy-makers, advocacy groups, politicians and the public for uptake. Policy-makers were engaged through the Royal College of Physicians Tobacco Advisory Group (led by the research team) reports on nicotine regulation. MHRA engagement, through meetings, successfully made the case that the comparator for the safety of nicotine products should be the cigarette, leading to the decision to introduce permissive nicotine licensing in June 2013. Meetings with NICE led to promotion of harm reduction strategies, a NICE citizens council on harm reduction, and the Programme Development Group on harm reduction.

The **prescribing errors** case study demonstrates proactive engagement with research users to ensure translation of research findings into practice. Researchers work closely with regulatory bodies, the DH, professional organisations (RCGP, Royal Pharmaceutical Society) and commerce to improve practice and reduce harm. Proactive working with the RCGP ensured recommendations for improvements to GP training were taken forward

The **influenza** case study demonstrates extensive impact on national and international health policy and clinical care for continent-wide populations though engagement with the UK government and the WHO in co-production of research and translating findings into policy and clinical practice. DH (England) asked the Health Protection group to design, establish and lead the Influenza Clinical Information Network (FLU-CIN) to study the epidemiology of influenza in UK hospitals. The group's work fed directly into UK and WHO global influenza clinical management guidelines, UK recommendations for immunisation of pregnant women and children and draft Pandemic preparedness planning guidance for the European Union.

The **QRisk** case study highlights the process of developing a research resource (QResearch database), exploiting it to answer major clinical questions and implementing research findings through commercialisation, national guidelines and care quality indicators. The primary care epidemiology group engaged with research users including the National Director of Coronary Heart Disease and Stroke, the vascular screening programme, the NICE guideline group on lipid modification and the team developing indicators for inclusion in the National Quality and Outcomes Framework. Commercialisation was achieved through development of ClinRisk Ltd which produced software for use by healthcare professionals and the public.