

<p>Institution: Lancaster University</p>
<p>Unit of Assessment: 3 Allied Health Professions, Dentistry, Nursing and Pharmacy</p>
<p>a. Context</p> <p>The mission of the Faculty of Health and Medicine (FHM) is to pursue biomedical, clinical and social scientific research with the explicit aim of improving the health and wellbeing of the human population, at local, national and international scales. We aim to create knowledge that is relevant, timely and substantial enough to generate impact. The main non-academic beneficiaries of our research are individuals and communities that experience ill-health and disability in the UK and abroad, and governmental and non-governmental organisations that seek to help such individuals and communities either through new diagnostic or therapeutic approaches and preventative measures, or via policies to effectively deliver existing and new therapies. The main categories of research we pursue and the types of national and global impacts they deliver include:</p> <ol style="list-style-type: none"> 1. Evidence for the efficacy of potentially therapeutic compounds from <i>in vitro</i> and <i>in vivo</i> experimental biomedicine, which impacts on drug development and availability to the population. 2. Development of new markers for early diagnosis of disease and for tracking of disease progression, which impacts on more effective healthcare delivery. 3. Assessment of environmental microbiological risks to human health, which impacts on the awareness of such risks and implementation of appropriate preventative measures. 4. Investigation of pathogenic mechanisms and the provenance of infectious agents, which impacts on the design and delivery of anti-infective and anti-vector control programmes. 5. Examination and development of new therapies for mental health conditions, which impacts on the availability, choice and capacity of improved treatments for such conditions. 6. Assessment of the effectiveness and shortcomings of current healthcare provision, which impacts on both NHS and international service provision, resource use and policy. 7. Investigation of the engagement of the public with health and social care service providers, which impacts on policy development and improved understanding of service user needs. <p>Specific examples of such impacts and how they are derived from our approach to impact are detailed below and in our Impact Case Studies.</p>
<p>b. Approach to impact</p> <p>The guiding principles of our approach to maximise the reach and significance of our research impacts have been as follows:</p> <ol style="list-style-type: none"> 1. To directly engage with service users of our research including patients, their families and the public to inform the research process (increases significance and uptake by ensuring setting of the the right research agenda); 2. To develop links between academic researchers and health and social care professionals (increases reach and significance by ensuring that research translates into changes in clinical practice, social care and operations); 3. To develop international and national partnerships (increases reach by dissemination to a wider group of end users). <p>We encourage all staff to engage with external partners in delivering and shaping the impacts that flow from their research, thereby creating a climate and context for research use. This includes support for the development of specific user groups, working with communities, engagement with charities and NGOs that deliver healthcare and/or support applied research, and with government departments that are mandated to deliver health care to the UK and global population. Financial incentives include opportunities via: i) Lancaster Pathways to Impact funding; ii) FHM Knowledge Exchange awards; and iii) the Public Engagement with Research grant scheme, all of which operate a competitive annual call to pump prime relevant activity. Knowledge exchange and public engagement activity is also explicitly recognised in workload models for staff during annual Personnel Development Reviews (PDR) and is a specific criterion in cases for promotion.</p> <p>Engagement with service users</p> <p>Involving service users in the research process has always been an important principle for FHM,</p>

Impact template (REF3a)

and an excellent way to deliver impact. One example of this is the Lancaster Research Partner Forum, established in 2007 to develop and support user involvement within the Cancer Experiences Collaborative (CECo) (Professor Payne, Dr Froggatt & others). The Forum comprises members of the public and service users with an interest in palliative and supportive care. Patients and their families have opportunities to be integral to the research process from planning through to dissemination, for example, in the NIHR-funded APPROACH study (Analysis and Perspectives of integrated working in Primary care Organisations And Care Homes) that examined integration between care homes and health services. The IOELC has also worked closely with St John's Hospice and the national initiative 'Dying Matters' for a number of years.

http://www.lancs.ac.uk/shm/research/ioelc/programmes/older_people.php#approach

Another example is the Spectrum Centre, which specifically employs service users with lived experience of mental health conditions to ensure that all of the research undertaken, from psychopathology to implementation of therapies in practice, is informed by the values and priorities of those living with the condition under investigation. Spectrum been commended by the national MHRN for our involvement of service users through good practice reports and shortlisting for their award. Spectrum Connect now has over 500 participants, mainly with bipolar disorder, who are engaged with and updated about our research. Spectrum research is cited as an exemplar of user engagement in BBC online, Nursing Standard, BBC Woman's Hour and the Guardian newspaper, and has provided one of our Impact Case Studies.

<http://www.lancaster.ac.uk/shm/research/spectrum/spectrumconnect/>

Research on *Mycobacterium avium paratuberculosis* (MAP) has identified MAP as a trigger for Crohn's disease, one of several contributors to Inflammatory Bowel Disease (IBD) (Professor Pickup). This work has led to increased awareness amongst patient groups, changes in pasteurisation practices and substantial media attention, through coverage on television and radio via filmed and live broadcast (BBC Newsnight, BBC Radio 4 Farming Today, BBC Countryfile, BBC Wales News), in the popular press (e.g. Daily Mail) as well as in the specialist press. In addition, these media programmes and public lectures citing this work are available on YouTube. Work is also cited on websites such as International Association for Paratuberculosis (<http://www.paratuberculosis.org>), John's disease Information Center (<http://www.johnes.org/>) and other Crohn's-related sites. Public benefit is evidenced by letters to scientists following broadcasts, increased public awareness, information for Crohn's related charities including Crohn's and Colitis UK and Crohn's web-based information services such as www.crohn.ej. Changes in government policy are predicted to follow as the causal effects of MAP become fully appreciated.

http://www.lancs.ac.uk/shm/news/may_2013/cattle_bacteria_widespread_in_uk/

Development of partnerships with health and social care professionals

Clinical partnership as an approach to deliver impact is a feature of many research projects. Professor Goodacre (an honorary consultant rheumatologist) and colleagues at UCLAN have developed a new device to detect knee osteoarthritis. Based on an acoustic approach, diagnosis through "noisy knees" offers a cheap and practical tool for GP surgeries and clinics, avoiding the use of expensive MRI scans and allowing earlier treatment (<http://www.bbc.co.uk/news/health-10630883>). Dr Owen-Lynch in collaboration with Professor Stefanovska (Physics) and others have developed novel methods for cardiovascular blood flow measurement with colleagues at the Royal Lancaster Infirmary. Blood circulation is a complex non-linear dynamic system, and the development of an "endotheliometer" to measure impairment of function with age will have important impacts for prevention of cardiovascular disease, a leading cause of death. (http://www.lancs.ac.uk/shm/news/june_2013/studying_the_uk_s_biggest_killer/). All Spectrum research on bipolar disorder involves partnership with NHS trusts, for example the PARADES NIHR programme grant is hosted by Manchester Mental Health and Social Care Trust.

LiLaC, the Liverpool and Lancaster Collaboration for Public Health Research, is one of eight academic centres of excellence comprising the NIHR School for Public Health Research (SPHR). Professor Popay is the Lancaster lead and national Deputy Director of the School. Total funding of £20 million over five years will be provided by NIHR from 2012-2017, up to £450K per annum to each member such as LiLaC. The projects undertaken place an emphasis of practical solutions, directly engaging with clinicians and health professionals to meet the needs of policy makers, practitioners and the wider public. Those already underway at Lancaster include an evaluation of the Men in Sheds programme designed to improve the health of older men (Lancaster lead

Impact template (REF3a)

Milligan) and modelling preventative interventions in chronic disease to address inequalities of provision (Lancaster lead Diggle).

The **Clinical Research Hub** was established in 2010 to enable increased NHS / University interdisciplinary collaborative research and impact in health and medicine across Lancashire and Cumbria (http://www.lancs.ac.uk/shm/work/clinical_research_hub/). Current membership: i) North Cumbria University Hospitals NHS Trust; ii) University Hospitals of Morecambe Bay NHS Foundation Trust; iii) Lancashire Care NHS Foundation Trust; iv) Blackpool Teaching Hospitals NHS Foundation trust; v) Lancashire Teaching Hospitals NHS Foundation Trust; vi) Calderstones Partnership NHS Foundation Trust; and vii) Lancaster University. The University of Cumbria has recently joined the Hub, thereby increasing its capacity to support high-quality research among the local NHS nursing and allied health professionals (AHP) workforce. FHM funds an Associate Director of Clinical Research (Dr Spencer), a Hub Manager (Dr Dixon), and Project Development Manager (Dr Milan), under the leadership of Professor Goodacre. In 2011-12 projects generated income of ~£560K including NIHR funding for a clinical trial of the renoprotective benefits of leukodepletion for patients undergoing heart valve surgery (with Blackpool), a series of systematic reviews of patient safety in anaesthesia (with Morecambe Bay) and an NIHR clinical lectureship (Dr Martindale, NHS senior physiotherapist) focusing on ankylosing spondylitis. The success of Dr Martindale's lectureship has stimulated her NHS Trust (Wrightington, Wigan and Leigh NHS Foundation Trust) to establish a clinical academic post for her on completion of her lectureship in 2014. This will maintain her research programme with FHM and to provide a focus for developing AHP research and innovation in the Trust. In 2012-13 cross-sectoral partnerships generated over £670K income including development of a non-invasive biomarker for knee osteoarthritis (Prof Goodacre) and a new biomarker for autism spectrum disorder (with Blackpool). The Hub works closely with the NIHR Cumbria & Lancashire CLRN, the North West Research Design Service, the Cumbria & Lancashire Health Innovation and Education Cluster, and with the new North West Coast Academic Health Service Network. A launch conference in September 2012 included contributions from Dr Louise Wood (Head of Innovation and Industry, Department of Health), Dr John Stageman OBE (Chair of BioNoW Ltd), Dr Susan Davidson (Research Advisor, Knowledge Management, Age UK) and Professor David Croisdale-Appleby (Chairman, Skills For Care) and brought many non-academic end users to the campus to stimulate new partnerships. The Hub has established a formal partnership with Bionow (<http://www.bionow.co.uk/home.aspx>; comprising over 160 biomedical companies) to develop an effective interface with the Life Sciences and Health Technology sectors across the North of England, building on existing bilateral relationships with companies such as Ibis Organics, Veraz, eBiogen, and Glaxo Smith Kline. The Hub has already attracted senior level interest within NHS England, NIHR and Technology Strategy Board, and has been invited to advise on similar initiatives in Durham and Surrey universities.

Development of international links

Many of our projects are international in scope, providing opportunities to increase the reach of our research impacts. One example is work on hydrocephalus and use of folate supplementation as therapy (Dr Owen-Lynch). Performed in collaboration with Dr Miyan (Manchester), research using in vitro and in vivo models of hydrocephalus (abnormal brain development in the foetus) showed a biochemical imbalance that could be reversed by addition of extra folate to the diet, restoring normal development. Pre-clinical research projects and training of staff are underway in Pakistan with a view to folate supplementation during pregnancy as there is a high incidence of hydrocephalus in Pakistan (1 in 100 live births). Another example of an international link beginning to deliver impact is work on agents of cutaneous leishmaniasis in Ghana (Professor Bates). Following signing of a Memorandum of Understanding between FHM and the Noguchi Memorial Institute for Medical Research (NMIMR) based in Accra, a successful application for a collaborative Africa Award funded by the Leverhulme Trust/Royal Society is in progress. The project involves engagement with the Ghana Health Service and clinicians in Ghana as well as close liaison with the communities affected by this new outbreak of disease. Spectrum's international links include a lead role in the European Association for Behavioural and Cognitive Psychotherapy Bipolar SIG (Jones Chair) and collaborations with Berkeley, Yale and UCLA on current research projects. The work of the International Observatory in End of Life Care is well known internationally, and engagement with health professionals and ministries across the world has been key in developing and improving palliative care resources (one of our Case Studies).

Impact template (REF3a)

c. Strategy and plans

Over the next REF period we plan to increase our research-led impact and ensure that research impact is a clear priority understood by all staff and firmly embedded in our research culture. The KPIs below will enable us to monitor progress and take action to enhance our delivery of impact.

Biannual Impact Audit

In July 2012 we published our first Impact Audit to highlight some of our recent areas of activity (http://www.lancs.ac.uk/shm/about_us/impact_report_2008-12/). This serves as a very public incentive to staff, as contributions to delivering impact are shown to be valued. This will complement existing incentives via small grant schemes, PDR and promotion criteria.

KPI: to continue to produce a biannual Impact Audit over the upcoming REF period.

Engagement with end users

One untapped route to impact is to make use of work-based learning contacts in our Centre for Education Training and Development to establish further links with the third sector. A scoping exercise has identified a number of possibilities for marrying up the research interests of external organisations with those of our own staff. Using our own students as the contact we will exploit our connections, initially to establish joint research interests, but with a view to delivering the impact of that research through the partner organisation.

KPI: to establish 5 new partnerships delivering impact with third sector organisations.

To enhance user engagement various meetings have been hosted on campus to bring such individuals into contact with researchers. Although successful, thus far we have proceeded on an ad hoc basis, for example the Parkinson's UK Lancaster & Morecambe Support Group meeting in August 2011, Bipolar Disorder Special Interest Group meeting held in April 2012 and the Innovation in Healthcare Management and Delivery Workshop in June 2013. We will encourage such activity in a more strategic manner, aiming to host one conference per year explicitly for end-user engagement. FHM funds will support such conferences, and bids will be competitively judged.

KPI: to host at least one end user conference/workshop per annum through the REF period.

Development of links with health and social care professionals

We are exploring extension of the Hub with local Clinical Commissioning Groups. This would open up new opportunities for research and impact, especially in preventative medicine which is generally under-researched. Our leadership role in the North West Coast AHSN will also generate impact. Spectrum houses a CLRN funded post to facilitate research recruitment in primary care for mental health and IOELC has a part-time Research Nurse funded by CLRN for the last 2 years.

KPI: to maintain the year on year increase in the value of external partnerships above the rate of inflation over the REF period.

Development of international links

FHM is currently in discussion with the Federal University of Minas Gerais (UFMG) in Belo Horizonte, Brazil to set up a formal research partnership. This will allow staff and student exchanges and facilitate joint research grant applications. This will provide a conduit for impact, for example to influence control programmes in Brazil for malaria and leishmaniasis. The recent appointment of Prof Sinkins (malaria and mosquitoes) and Dr Urbaniak (trypanosomiasis and leishmaniasis) increases our potential to generate such impact.

KPI: to deliver two new potential Impact Case Studies for REF2020 through engagement with UFMG and/or other international partners.

d. Relationship to case studies

Our 7 Impact Case Studies relate to our approach to impact in several ways. **Engagement with service users** is a strong feature in four Case Studies: those on drugs for Alzheimer's disease; on bipolar disorder; on learning disabilities; and on public engagement in policy making. **Development of links with health and social care professionals** is exemplified by the three Case Studies on drugs for Alzheimer's disease, bipolar disorder and international development in palliative care. Finally, **development of international links** is prominent in three of the Case Studies, those on international development in palliative care, loiasis spatial modelling, and evaluation of UVA risk in skin carcinogenesis. As these Case Studies have matured they have also informed our approach, in particular reinforcing the importance of engagement with service users, which is now recognised as an important element of research strategy across the Faculty.