Institution: De Montfort University

Unit of Assessment: 3 Allied Health Professions, Dentistry, Nursing and Pharmacy

a. Context

Main non-academic user groups, beneficiaries or audiences for the Unit's research

Our research has benefitted:

- local, national and international healthcare providers (including the USA, Canada, Australia, New Zealand)
- voluntary organisations (Open Mind IAPT, Infertility UK), patient support groups (the Patients Association, Sickle Cell Society) and national charities (Thomas Pocklington Trust, Silver Star Diabetes Charity, RNIB)
- policy at government level in the UK (Department of Health, NICE, Human Fertilisation and Embryology Authority, Department of Education, Parliamentary Sickle Cell Group, Nuffield Council for Bioethics), in Europe (European Society for Human Reproduction and Embryology and in the USA (Centres for Disease Control, Surgical Care Improvement Package Initiative)
- professional clinical organisations, e.g. associations for operating room nurses and surgeons in the UK, the USA and Australia
- third sector organisations, the National Gamete Donation Trust, to support recruitment of egg and sperm donors in the UK
- Pharmaceutical and related industries, e.g. AstraZeneca, GEA Pharma Systems, Molnlycke, 3M

Main types of impact

The primary focus of our research is to improve practice. This is demonstrated through the production of numerous national and international clinical guidelines and contribution to policies, for example, in surgical site infection, deep venous thrombosis, pressure ulcers, eye health, fertility care and geophagy. Our research benefits the wider society by improving working conditions for people with mental health, access to infertility treatment and treatment for people with sickle cell disease. Our research has an economic impact, saving treatment costs across the NHS through preventing expensive surgical site infections, pressure ulcers and deep venous thrombosis and reducing costs to society by facilitating the employment of people with mental health conditions. Pharmaceutical research has led to the development of drugs which have gone into clinical trials and patents for (i) new measurement instruments for use in pharmaceutical manufacturing process control and continual improvement, and (ii) new bio-responsive drug delivery systems.

b. Approach to impact

The Unit has concentrated on six main approaches to facilitate impact.

1. Commercialisation of laboratory based research

Laboratory based research is developed commercially through collaborative partnerships. Researchers have collaborated with Renfrew Group International to develop an artificial pancreas, which has been used successfully in pre-clinical trials. A TSB collaborative R&D programme with GEA Pharma Systems, AstraZeneca and Ametek has produced a new instrument (LyoDEA) for use in freeze-drying process understanding and formulation development for biopharmaceuticals. The instrument is being commercialised by GEA Pharma Systems.

In collaboration with local hospitals and GlaxoSmithKline, a highly sensitive analytical technique has been developed that allows monitoring of therapeutic drug levels in single drops of blood. The technique has been applied to neonate samples and is currently being developed as part of a non-invasive drug-monitoring programme. Following laboratory and preclinical studies, researchers developing an anti-cancer prodrug, AQ4N, successfully liaised with commercial companies to license the drug for clinical trials, generating an income of around £800,000 to DMU over 10 years since 2003.

2.Collaboration and formal partnerships with key stakeholders

A joint post (DMU/University Hospitals of Leicester NHS Trust) (2006) has led to a programme of research around infection prevention, which has resulted in the implementation of surveillance programmes, initiatives to reduce infections and changes to commissioning targets. Many of these changes have been replicated across the UK and fed into policy in the UK and abroad including World Health Organisation guidelines for hand hygiene and the national Surgical Care Improvement Project in the USA (2008 onwards).

The pharmaceutical technologies group has organised a number of events for industry, including the Skin Health Day (June 2011), Dissolution Workshop (June 2012), Continuous Processing Seminar Day and Workshops (September 2012) and Inhalation Day (November 2011), to develop

new collaborations between businesses, corporates and academic establishments. In April 2013, the group hosted their first symposium on Quality by Design, bringing together leading global figures such as the Vice President Medicines Development, AstraZeneca and the Senior Assessor at the MHRA.

3.Engagement with user groups

Researchers in mental health were instrumental in setting up the Service User and Carer Research Audit Network (SUCRAN) (2009 -). SUCRAN ensures that needs of service users and carers are identified through user and carer-led research. SUCRAN projects have been commissioned from Leicester City and County PCTs, Leicestershire County Council, the National Institute for Health Research, Open Mind IAPT Service and the National Mental Health Development Unit. Audits and evaluations show these studies have changed local commissioning priorities, improved access, and provided information and employment for people with mental health conditions.

Assisted reproduction researchers have worked with licensing authorities for infertility treatment in the UK (HFEA) on issues of ethnic diversity and gamete donation and with professional bodies in Europe (ESHRE), providing background information to inform an international code of practice for cross border fertility care (2009/10). Findings from a study of donor gamete recruitment were used to develop, in collaboration with the National Gamete Donation Trust, a strategy to enhance the recruitment of egg and sperm donors from minority ethnic communities across the UK (2008).

Researchers in sight loss have undertaken a series of community engagement projects to address inequalities in eye healthcare across the UK (2006-2009, 2010-2012).

A terahertz imaging and spectroscopy centre has engaged with over 30 regional businesses to provide training and awareness in applications for the technology for pharmaceutical product development. A new collaboration has developed between University Hospitals Leicester NHS Trust and the Pharmaceutical Technology Group to develop a terahertz based method for the diagnosis of melanoma.

4.Active dissemination and public engagement

Researchers developing the artificial pancreas have worked to build a media presence. The artificial pancreas, which featured in a Channel 4 documentary in 2013, is part of the current 'bionic man' exhibit at the Science Museum, London, and is one of the RCUK's Big Ideas for the future. It was cited by the Telegraph in 2012 as one of the 10 life changing ideas to emerge from a UK university. The artificial pancreas was showcased at the Global Life Science Summit in 2012, hosted by Lord Darzi. Public accolades have also been awarded to the 'dried blood spot' research project, which was nominated for Research Project of the Year at the 2012 Times Higher Education Awards.

A member of academic staff from this Unit was appointed as a Research Media Fellow in 2010 with a remit to promote research to non-specialist audiences through press engagement. This resulted in, for example, research into compounds found in fruit and vegetables being reported in the BBC News, The Observer and the Daily Mail and researchers in cot death providing an expert opinion piece in the Guardian.

Assisted reproduction researchers have produced patient resource booklets, CDs and DVDs on IVF available in several South Asian languages and an online training module on cultural diversity and endometriosis for health professionals. A Guide to School Policy on Sickle Cell Disease is freely available as an open education resource. The 'minority-ethnic-health@jiscmail.ac.uk' (approx 550 members) served as the main community of practice for NHS Evidence's specialist collection on ethnicity and health. Work for the Birmingham Children's Fund resulted in publication of a legacy document for training services. More than 2000 copies have been taken up and used by services locally and nationally since 2009.

5.Policy advice and lobbying

Researchers in sickle cell disease worked with the All Parliamentary Group for Sickle Cell (2006-2011) persuading the Department of Education to include sickle cell within the managing medicine in schools policy. Researchers who discovered the harmful effects of geophagy, a common practice among Bangladeshi women of eating baked clay while pregnant, worked with the UK Food Standards Agency to stop the sale and import of baked clay. Researchers liaised with the Health Protection Agency (HPA) to publish advice about geophagy on the HPA website.

Researchers in patient safety have worked with a NICE expert panel group (2012 -), a NICE effectiveness group (2013 -), a NICE technology appraisal group (2010 -), and a NICE review group (2007-2010) to develop clinical guidelines and national policies for surgical site infections

and deep venous thrombosis.
Researchers in sight loss presented to a Department of Health strategy group (2010 -), leading sight loss charities (2007 -) and the Welsh Assembly Government (2009), which influenced the national eye health strategy (Vision 2020).
Lobbying by researchers working with service users and carers in mental health has led to pledges from chief executives, representing Care Commissioning Groups, the Race Equality Council, Leicester City Council, the Chief Constable and a Local MP who, for example, has pledged to become a Champion for Mental Health.
Reproduction researchers have provided policy advice to the Human Fertilisation and Embryology Authority (HFEA) and the All Parliamentary Group on Infertility.

6.University funding initiatives to support impact

Researchers in pharmaceutical quality by design were awarded HEIF funding to develop an online MSc programme in close collaboration with leading UK and international industrialists from the pharmaceutical and related industries. University funding schemes, such as the competitive Revolving Investment Fund, supports dissemination projects for the Unit's research findings, e.g. free seminars for members of ethnic groups to highlight the dangers associated with geophagy.

c. Strategy and plans

Building upon the previous section, the Unit's strategy to develop and embed impact will refine and further develop this approach and pro-actively monitor other possible avenues to develop impact from our research. Specifically, over the next census period we will:
Increase commercialisation: Increase the commercialisation of research findings through (a) exploitation of existing patents, licences and 'spin out' companies, and building relationships with businesses who may have a commercial interest in our research findings (b) supporting emerging commercial enterprises (c) pro-actively monitoring tender alerts in our key sectors of health and wellbeing.
Continue collaboration and formal partnerships with key stakeholders: Identify and develop mutually beneficial strategic partnerships, which will lead to knowledge exchange, collaborative research and other outputs.
Increase engagement with user groups: Build upon existing user engagement successes within the Unit to implement this approach across all of the Unit's research groups.
Strategic planning for research staff: Implement individual research plans for all research staff to identify strategic direction and objectives for the focus of their research and outputs. Identify individuals within a project who are responsible for non-academic dissemination and impact development. Build active dissemination strategies into all research projects at the planning stage and increase project reporting with the press office.
Increase consultancy: Increase the profile of research expertise for use in consultancy through targeted marketing opportunities, including web presence and existing and new collaborations.

d. Relationship to case studies

- Studies within the Surgical Site Infection case study have been derived from collaboration with stakeholders. Clinical staff from local healthcare providers and patient user groups have been collaborative partners. Links with industry have led to numerous trials of clinical products. Active dissemination has enabled the lead researcher to visit 10 hospitals to discuss implementing SSI surveillance. The lead researcher is an invited member of a national policy making organisation (NICE) and a key opinion leader for several commercial companies. The university's press office has provided media training and assisted with press releases.
- Researchers in the Assisted Reproductive Technologies case study worked collaboratively with support groups, professional associations and third sector organisations to undertake research and worked with licensing and regulatory authorities to develop codes of practice. As well as conventional dissemination, researchers held public engagement events and produced booklets, DVDs, CDs and resources for professionals.
- The Sight Loss case study shows success through working collaboratively with user groups, shaping policy through participation in national steering groups and making research findings widely available.
- Changes to clinical practice highlighted in the Deep Venous Thrombosis case study were facilitated by the researchers' proactive involvement in NICE, the Department of Heath and the House of Commons.