Institution: Plymouth University

Unit of Assessment: A3 Allied Health Professions, Dentistry, Nursing and Pharmacy

a. Context:

The impact of the research in this Unit reflects the diverse range of research submitted from groups within allied health professions, nursing and midwifery, dentistry and biomedical science. The range of beneficiaries, stake-holders and end-users of our research is equally diverse, including patient groups, health professionals, NHS service delivery groups, the National Institute for Health and Clinical Excellence (NICE), National and International Higher Educational groups, Department of Health, the pharmaceutical industry, European and Local Government. Our researchers are working with these groups to develop the research impacts in a variety of settings.

Examples, from the *Allied Health Professions* group, include the work of Marsden and Freeman with patient groups, UK companies and the GB Paralympic team on developing novel medical orthopaedic and sports supports and of Skirton (Impact Case study 1) researching delivery of effective healthcare services to individuals, families or populations affected by or at risk of a genetic condition. Within *Nursing and Midwifery* Endacott, Williamson and Stenhouse are working with patient groups, health professionals and European clinical bodies to examine factors influencing how change in a patient's condition is assessed and managed, Richardson and co-workers are researching the health impacts of climate change and resource scarcity where the main impacts are on the environment, healthcare products, practitioners and services, and work by Boulos is informing the WHO and European health policy on social media applications in public health surveillance, health education and promotion. Within the *Dentistry* group, Moles and Nasser (Impact Case study 3) are developing research on research priority setting (RPS) that has been used to prioritise topics for rapid technology assessment and has informed NICE and Cochrane. In the *Biomedical Science* group, a focus is on the application of new diagnostic and therapeutic strategies with beneficiaries of the research including patients, NHS and public health bodies, the pharmaceutical industry and commercial healthcare organisations. Examples include Avent's work (Impact Case study 2) on the development and implementation of molecular blood grouping and non-invasive prenatal diagnosis (NIPD) and, in association with Sewell (Impact Case Study 4), on defining and developing understanding of dose banding for Chemotherapy.

b. Approach to impact (during the period 2008-2013):

In 2009 the University launched its Enterprise-based research strategy, placing greater emphasis on the need to engage in research with benefits beyond academia. This new drive to link academic and research activities to enterprise and knowledge transfer was supported by new institutional facilities and programmes, resulting in Plymouth being nominated twice as Enterprise University of the Year in the Times Higher Education awards. The need to enhance translation and impact led to the formation of University Institutes to engage with key stakeholders, beneficiaries, and end-users of research. The Research Centres within this Unit now operate through the *Institute of Health and Community* (IHC) and the *Institute of Translational and Stratified Medicine* (ITSMed).

Given the diversity of research within this unit, no single model for engagement with key users to develop impact can apply. Institute monitoring of impact, including that in our case-studies, recognised that impact develops most readily through the support and nurturing of productive relationships with external agencies. A number of mechanisms have been introduced on the basis of identified best practice:

- *A Proof of Concept programme to provide pump priming funds and research placements for knowledge exploitation.* A research placement within the Centre for Research in Translational Biomedicine (CRTB) allowed initial work by Fejer that subsequently led to commercial collaborations with a local company on his novel macrophage cell line.
- *Support of commercial funding, and co-funding, including KTP awards, CASE awards and the University's own 'VC's Community Research Awards', launched as part of the PU enterprise agenda. A* community award for Freeman and KTP support for Marsden led to the development

of novel dynamic elastomeric fabricated orthotic shorts manufactured by DM Orthotics, a South West based company. The company is now selling its product across the world and has expanded its sports range on the basis of this success. These garments were worn by Paralympians in the London 2012 games and are used by premiership rugby and football players.

- *Support for clinical interactions and partnerships to ensure that research questions and research effort remain clinically relevant*. Strategies to enhance collaboration and maximise opportunities for impact include joint appointments of nursing professors planned with 4 NHS Trusts in the SW Region, and specialist clinics operated by research and clinical staff such as the primary care Dental Clinic. Clinical academics are appointed as research fellows to engage with research within CRTB and drive the translational and clinical research agenda. Such interactions have been critical to the success of the work by Avent on the development and implementation of molecular blood grouping and non-invasive prenatal diagnosis (NIPD) into routine clinical (impact case study 2).
- *Inclusion of research end-users on Research Centre advisory boards.* Examples include members of industrial companies such as Astra Zeneca as clinical consultants on the CRTB advisory board. This has helped focus research on projects identified by industry as relevant for development or regulatory requirements. For example, work by Jackson on novel 3D cell cultures has been supported through Astra Zeneca following discussions at such advisory meetings.
- *Research conferences and workshops held jointly with research end users and stake holders*. Examples include a European-funded workshop on molecular approaches to non-invasive pre-natal diagnosis, and Skirton's pan-European workshop and focus groups with a wide range of healthcare professionals and patient organisations to assist the development of guidelines and genetic core competencies for health professionals (Impact case study 1). Nasser and Moles in the Primary Dental Care cluster have since 2008 organised annual workshops as part of the Cochrane Colloquia and has developed a web-based platform to interact with all contributors. This in turn led to adoption of their research priority setting by NICE and Cochrane (Impact case study 3).
- *Increased communication with outside agencies to increase awareness of opportunities for development of research impact*. Examples include Kay's Chairing of Shirley Glasstone Hughes Dental Research Foundation, and membership of the NICE Public Health advisory Committee and Jackson's membership of the RSPCA Expert Group on sepsis and cell models of sepsis research.

c. Strategy and plans (for supporting impact):

The impact strategy of the Unit has been developed and informed by our monitoring of research outcomes, including those of the case studies below, and was specifically developed in relation to the university Research and Innovation Strategy through which its enterprise agenda is pursued. It has been further shaped in relation to the more recent and forward-looking 2020 strategy that encourages public/commercial engagement and the commercialisation of research outcomes for the public good. Making impact a core activity for all our researchers has led academic staff to extend their research activity beyond standard discipline-specific boundaries. Consequently, the over-riding strategic aim for researchers in this UoA will be to continue to develop our capacity to deliver multi-disciplinary based projects that involve commercial and third-sector partners.

A number of strategic activities are planned to achieve this goal:

i. to embed user input in all our research activity;
ii. to share best-practice on maximising impact;
iii. to engage with wider professional networks and CLAHRC's to identify key research topics in terms of expected impact;
iv. to embrace digital technology to enhance impact capability;
v. to resource and support clusters to deliver impact from research;
vi. to develop appropriate KPI's to monitor the significance and reach of impact arising from the constituent research clusters.

There has already been significant progress with aims (i), (iii) and (iv), and researchers in the E-Health cluster are sharing expertise to further develop aim (iv). This will also enhance engagement with further professional networks, such as optometry, dentistry, medicine and pharmacy, and so help to deliver aim (iii). To move further on aims (i) (ii) and (iii), our Research Centres work with specialist teams in the Institutes to enhance interaction and engagement with key external agencies and so to maximise exposure to beneficiaries of the research and disseminate information and best practice. For example, CRTB is developing exposure to end-users and professional networks through the engagement of ITSMed with relevant NHS groups and NIHR, NICE, and the pharmaceutical industry. To support aim (vi), we will encourage an impact-led culture through the explicit weighting of impact-related activities in our work-load allocation policies, in our performance monitoring and review processes, and in our promotion decisions, so that all staff are aware of the value of impact-related activity for their career development. To help deliver aim (v), Faculty funds have established competitive schemes such as interdisciplinary PhD studentships with external partners. In addition, a University Commercialisation Committee has been established, chaired by Avent, to identify projects likely to have high commercial impact and to support their development. Specific support and resources are given to staff wishing to lead impact-led grant applications, such as interdisciplinary calls made by the research councils or NHS. We also plan to develop our communication strategy so that we are more visible to potential external partners and that we are able to effectively disseminate the results of our research. We will employ individuals with the capacity to engage in impact-based research and will ensure that all staff have appropriate training in this area, including media-training, from external providers and from workshops run by the University's Business Partners and KTP specialist advisers.

d. Relationship to case studies:

The case studies selected exemplify aspects of the research approaches adopted, especially the close engagement with specific stakeholder groups, including practitioners and businesses. The establishment of Research Centres and Institutes that support engagement activities and capture best-practice from across the unit has allowed us to develop strategy and to share this across research clusters. We are also learning from the case studies to inform the development of our research philosophy. The 4 case studies highlight different aspects of good practice that have been or are being included in our strategy and plans:

Case study 1 on 'Development of standards of professional competence in genetic counselling in Europe' emphasises the value of international networks of patients and health professionals to extend the reach of impact, and also the benefits of developing new networks such as the European network of Genetic Nurses and Counsellors. Case study 2 on 'Molecular blood grouping and Non-invasive prenatal diagnosis' has demonstrated the importance of developing international collaborations and networks to inform policy and for industrial stakeholders to drive the clinical implementation of the research. Case study 3 on 'Advancing methods for prioritising health research' demonstrates the value of exploiting existing national and international architecture to achieve impact, such as the Cochrane Collaboration established from conferences at Plymouth that led to the establishment of the Cochrane Agenda and Priority Setting Methods Group (http://capsmg.cochrane.org). Case Study 4 on 'Dose banding in Chemotherapy: improving patient care and efficiency of services' provides an example of how research linked to national surveys of UK prescribers and interactions with professional groups and Cancer Networks achieve impact and incorporation into professional guidelines being used in UK hospitals and increasingly across Europe.

The impact-case studies have taught us the value of maintaining reputation and sustaining a network of external contacts and our current focus is to strengthen the path from basic research to impact by building multi-disciplinary teams with expertise in translational research. Our future will see us becoming more adept at detecting opportunities for impact earlier, and being more proactive in our support for areas in which we are likely to be successful in achieving full impact.