REF2014: Impact template

Institution: Queen Mary University of London

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

1. Context

The School of Medicine and Dentistry (SMD) was formed in 1995 when The London Hospital Medical College ('The London', founded in 1785) merged with St Bartholomew's ('Barts', 1123) and they were incorporated into the newly formed Queen Mary. Queen Mary's research strength has grown rapidly in the past 15 years; it was admitted to the Russell Group in 2012. Collaborative links with industry and the public sector have increased significantly. The research described here spans 1995-2013, a period of rapid and significant change for Queen Mary's Institute of Dentistry (IoD) which has evolved from a (more or less) self-contained unit within The London to being part of a much larger, multi-faculty, multi-site organisation where collaborative research (both within and beyond the College) is now the norm. The IoD is committed to research that will have a wide range of substantial impacts bringing benefit to patients, to the local, national and international communities and to industry and commerce. Our approach develops from the strategy outlined in the Environment Template (REF 5) of undertaking oral and dental research in the mainstream of biomedical research with strong interdisciplinary links.

2. Approach to Impact

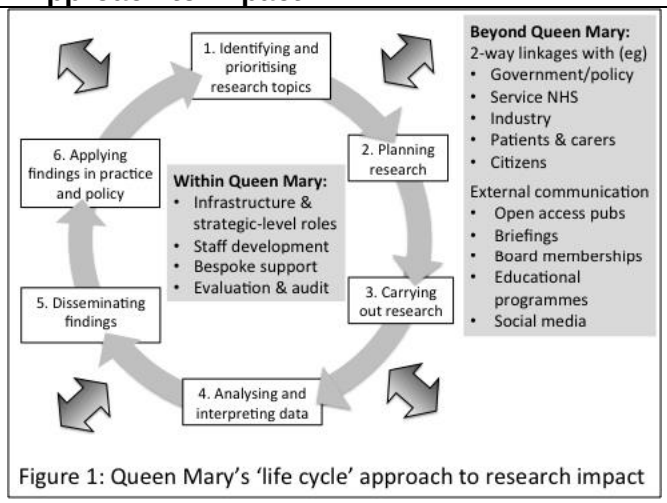

Figure 1: Queen Mary's 'life cycle' approach to research impact

Our current approach is underpinned by four guiding principles. First, links between research, innovation, practice and policy are complex and multidirectional. For maximum impact, researchers need to be fully engaged with potential users at all six stages of the research life cycle (Figure 1). Secondly, the knowledge, skills and techniques needed for undertaking world-leading research *impact* are different from those needed for achieving world-leading *research*. Orientation to impact requires a new set of expectations and rewards for academic staff; new training and development opportunities; and changes to research infrastructure. Thirdly, the impact agenda, with closer ties to policymakers and industry, raises potential biases and conflicts of interest. Ethical principles and codes of practice must be applied through robust governance procedures that overlap with the structures and processes for governing research. Fourthly, world-leading impact activity demands an ongoing programme of learning and improvement, informed by systematic audit of performance and the rapidly emerging evidence base on knowledge translation.

Drawing on these principles, we have created opportunities using six key approaches. *Beyond Queen Mary*, we have worked to (a) build and sustain links with stakeholder communities who may use our research and (b) develop broad and diverse external communication channels to reach these audiences. *Within Queen Mary*, we have set up (c) infrastructure and strategic roles for delivering the impact agenda; (d) staff development to build capacity for impact activity; (e) bespoke suport for individual projects; and (f) systems to evaluate and monitor this work.

2a: Building and sustaining links with key stakeholder communities

- **National and international policymaking.** In contributing to the enhancement of Oral Health Policies, both national and international, the approach has been to respond to policy priorities and work with policymakers at an early stage in the research process to frame and sharpen questions; develop a knowledge framework of high quality reviews (eg Cochrane Reviews on Topical Fluoride Therapy to prevent Dental Caries in Children), and then to make presentations to and produce reports for major national and international bodies. The research on developing the London Dental Atlas was stimulated by problems in the identification of victims during relief efforts of the 2004 Tsunami and the discussions that followed. It has been utlised in recent disasters (see case study) and internationally in Dental Education and Forensic Science.

- **Local policymaking and NHS clinical services.** Using Queen Mary support structures, IoD researchers have engaged with the community in local projects including the East London Oral Health Inequalities Study and the East London Family Study. This collaborative approach also underpinned work on Smoking Cessation and Oral Cancer Prevention, which was undertaken in consultation with the local community. Of particular note is the variety and strength of our links with vountary and faith-based groups in east London (where 66% of the population is from minority ethnic groups), which have been crucial for both recruitment to empirical studies and in disseminating the findings from completed research. Our larger research programmes take a network approach, seeking to bring multiple stakeholder communities (NHS, third sector, industry, national and/or local policymakers) together to generate critical mass and cross-fertilise across sectors, reflecting the 'organic' model of research impact described above. A good example in the IoD is the national developments leading to the establishment of Behcet's Centres of Excellence, based on research led by Prof Fortune's group and involving extensive consultations with patients, carers and clinicians within and beyond our local NHS partners.
- **Industry.** Our research groups work closely with Queen Mary Innovation (QMi) on commercial contacts, consultancies, patents and licensing innovations. Hence in translating the basic research in the Caries, Hard Tissue and Dental Physical Sciences group into products with public health and commercial value, we have used QMi technology transfer expertise. For example, the consultancy, ConsulDent has been established and Prof Hill has become a member of the GlaxoSmithKline Sensodyne Advisory Board. The following commercial contracts have been gained, in two instances following QMi Innovation Awards to demonstrate proof of concept of a new cements and coatings. A knowledge transfer partnership with PSP Dental has resulted in commercial production of a new glass ionomer cement and with another company, Hilti (Germany), other glass ionomer cements have been developed. Substantial improvement in clinical restorative care has followed from two contracts with DenMat Corporation who have successfully commercialised the new dental porcelain called "Lamineers". Over 3 million of these have now been placed and the product is marketed in 46 countries. Other new dental porcelains are being developed with Schottlander and Davis. Directed towards consumers a patented nanohydroxyapatite toothpaste (UltraDex) and mouthwash is on sale in Boots the Chemist and various supermarkets. In anticipation of future commercially viable collaborations between IoD and industry, GlaxoSmithKline and Johnson and Johnson have recently taken out licencing options on fluoride containing bioactive glasses.

2b: External communication to reach a diverse range of audiences

A significant positive shift in our external communications in the past 15 years has been away from a narrow focus on academic outputs (peer-reviewed papers, presentations at subject conferences) towards a broad and **multi-modal portfolio of communicative activity** in which both the message and the medium are targeted to the needs and styles of the different potential users. The case study 'The London Atlas of Dental Development and Eruption' illustrates the use of this multi-modal approach to communication

2c: Infrastructure and senior staff roles for delivering the impact agenda

Queen Mary has a well-developed infrastructure for communication and public engagement and provides the support for developing research staff in impact activity:

- **The Centre for Public Engagement** provides training, support and funding for new and exisiting public engagement activities for academics, postgraduate researchers and early career researchers.The Director of this Cente is Prof Mike Curtis, the current Dean of IoD.
- **Queen Mary Public Relations** provides expert advice and builds tailored impact strategies focused on connecting research with relevant audiences via press releases, Twitter and RSS feeds, podcasts, iTunesU and a YouTube channel. An active record of staff research expertise ('Find an Expert') is maintained for external users and media appearances are archived centrally. Media training is provided by QM's Learning Institute, described below.

2d: Staff development

In the annual appraisal process, staff are assessed on past achievements and supported to set future objectives in areas such as patient and public involvement in research, engaging with industry and/or the third sector, presenting findings to non-expert audiences and dealing with the media. To support this, we offer training and mentoring in the knowledge, skills and techniques needed for research impact through the Learning Institute and QMi. In 2010, criteria for academic

promotion were updated to include “contribution to knowledge dissemination” including “public, business, and international engagement activities”.

2e: Bespoke support for individual research projects

Research teams are offered a flexible package of support to ensure that attention to dissemination and impact runs through the life cycle of each study. Researchers are encouraged to apply for annual funding rounds to support project-specific impact activity.

3. Strategy and plans

Our **strategic objectives** span SMD, Queen Mary and beyond. They are:

1. Beyond Queen Mary, to:
   a. Extend and strengthen strategic-level links with key user audiences;
   b. Optimise activity in our networked collaborations within and beyond the HE sector;
   c. Continue to develop collaborative ventures with industry and the third sector;
   d. Attract research users from all stakeholder communities to our postgraduate courses;
   e. Identify and incorporate examples of best practice from other HEIs and elsewhere.
2. Within Queen Mary, to:
   a. Continue to develop and refine our infrastructure for research impact;
   b. Ensure that every researcher receives a personalised programme of training, support, incentives and rewards to develop the personal capability for world-leading impact activity;
   c. Identify and support particular individuals to become leaders in knowledge translation;
   d. Promote organisational and team learning about research impact;
   e. Improve our performance systematically year on year.

To achieve these strategic objectives we will implement the following **specific plans**:

3. Plans for developing our externally-facing impact activity:
   a. Establish a strategic level Advisory Board on Research Impact with external representation;
   b. Incentivise and reward high-impact external appointments for academic staff;
   c. Prioritise and reward networking activity in applied research eg via the Collaboration for the Leadership in Applied Health Research and Care or comparable cross-sector structures;
   d. Increase CASE studentships and secondments to industry in relevant research areas;
   e. Rationalise and expand our specialist postgraduate courses and the marketing of these;
   f. Organise exchange visits inter alia to other higher education institutions, industrial partners, policy think tanks, to capture ideas for best practice in research impact.
4. Plans for further developing our internal structures and processes include:
   a. Build themed collaborations, thereby increasing potential for large-scale impact;
   b. Review and revise in-house training opportunities;
   c. Work with the Human Resources Department to maximise staff development opportunities;
   d. Increase the overall resource available for researcher-led impact activity;
   e. Introduce, deliver and evaluate a programme of activities to raise awareness of research impact, including an annual showcase event to share best practice among research teams.
   f. Extend, refine and apply key performance indicators in a continuous quality cycle.

4. Relationship to case studies

Our case studies illustrate the range of impacts achieved and the highly successful linkages between our different research groupings and key stakeholder communities:

4a: Impact through links between basic science research and clinical practice: The proactive approach to exploring the application of basic science research advances to clinical practice is exemplified in the case study ‘Novel high strength and low wear Leucite glass ceramics’. Not only is this a commercial success but it also has brought considerable patient benefits by requiring less tooth reduction for excellent aesthetic and functional outcomes.

4b: Impact through links with policymakers: The case study, ‘Topical Fluoride Therapy to prevent Dental Caries in Children’ exemplifies our response to the recognised need to improve prevention of one of the most highly prevalent diseases worldwide, by summarising and presenting complex evidence in a way that policymakers could engage with and base decisions on.

4c: Impact through links with industry: The case study, ‘Apatite Based Additives for Toothpaste’ exemplifes the application of innovative long term basic science to develop new oral health products that enhance publich health and commercial development via links with industry.

4d: Impact through engagement with civil society: The case study ‘London Atlas of Dental Development and Eruption’ demonstrates how research on dental development has been used to bring significant human benefit in times of war and natural disaster as well as settle court cases.