Impact template (REF3a)

Institution: The University of Manchester
Unit of Assessment:4

a. Context

- The University of Manchester (UoM) places impact at the heart of its strategy. In this UoA, our impact strategy is one of translational research and innovation pipelines, integrating basic scientific discovery with the development, delivery and evaluation of interventions.
- Emphasis on integration within priority research areas underpinned the restructuring of the Faculty of Medical and Human Sciences, and resulted in the creation of the Institute of Brain, Behaviour and Mental Health (IBBMH) to strengthen translational research and drive impact.
- IBBMH is configured into four Centres, reflecting strengths in: mental health, dementia and cognitive neuroscience, developmental disorders, clinical risk management; and closely linked with two further Centres providing expertise in neuroimaging methods and health psychology.
- Manchester Academic Health Sciences Centre (MAHSC) provides a clinical test-bed and accelerates the implementation of innovations from our research. Mental health is a priority area in MAHSC, with the Academic Lead of the area being the Director of IBBMH (**Lewis**).

Key types of impact

- Neuroimaging biomarker discovery to aid drug development (**Deakin**; **Williams**) and provision of neuroimaging methods to pharmaceutical and biotech industries [exemplar case: **BIOXYDYN**].
- New therapeutic targets and more efficient use of existing drug treatments (**Anderson**; **Deakin**) [exemplar case: **CUtLASS**].
- Improving clinical outcomes through mental health service redesign, for example early intervention (*Marshall*; **Yung**); patient self-management (**Lewis**); integration of psychological treatments (*Calam*; **Wells**; **Green**; **Morrison**) [exemplar cases: **CBTPsychosis**; **NCISH**].
- Innovative, evidence-based training and education to practitioners on early intervention and prevention, and health related risk reduction [exemplar case: **STORM**].
- Changes in national/international health and social care policy and practice (**Cooper**; **Wearden)** [exemplar cases: **ACTNOW**; **CUtLASS**].

Key audiences

- Patients and service users.
- Healthcare policy makers in government departments.
- Healthcare provider organisations (NHS and non-NHS) and healthcare practitioners.
- Industry partners: pharmaceuticals, telecoms, computing and software.

Key beneficiaries

- People who have, or are at risk of, mental health problems, neurodegenerative or developmental disorders, and their families.
- Mental health practitioners and service providers.

b. Approach to impact
1. Building and managing relationships with stakeholders and key audiences

We made it a priority to identify and work closely with our impact stakeholders, both to understand unmet needs and to validate and communicate our innovations. Since 2008, we have focused on strengthening our influence with key stakeholders: healthcare policy makers in government departments; NHS commissioners and practitioners; industry and service users. Examples include:

- *Policy makers and government: providing evidence to influence policy and practice.* The Department of Health and NHS England appointed **Appleby** as the National Director for Mental Health until 2010, and National Clinical Director for Health and Criminal Justice (2010-13); and **Burns** as the National Director for Dementia Services (2011-13). NICE and MAHSC have

established a joint Memorandum of Understanding in 2011 with a mental health focus and honorary university posts for 8 NICE personnel [exemplar cases: **ACTNOW**; **CUtLASS**].

- *Healthcare provider organisations and service commissioners: progressing our research findings through the translational pipeline*. **Lewis** and *Marshall* are Associate Directors of the UK Mental Health Research Network. **Shaw** and *Senior* head the Offender Health Research Network. With NHS trusts, we secured Research for Patient Benefit and Health Technology Assessment funding to demonstrate efficacy of novel interventions. Examples: **Shaw**: mental health screening tool for police custody; **Lewis**: efficient prescribing of cheaper first generation antipsychotics; **French**: community intervention to increase walking after stroke; *Calam*: effects of parenting intervention for parents of asthmatic children [exemplar cases: **PARENTING+**; **ReduceDUP; NCISH**].

- *Healthcare practitioners: connecting research with healthcare practice.* 48% of returned staff are healthcare practitioners with key roles in service provision alongside their research roles. Manchester is a world leader in Cognitive Behavioural Therapy (CBT), and we deliver training courses to healthcare practitioners worldwide (*Tai*) [exemplar cases: **CBTPsychosis; STORM**].

- *Industry: developing academia-industry partnerships as a key vehicle for delivering impact.* We have strategic relationships with traditional and emerging industries [exemplar case **BIOXYDYN**]. The MAHSC m-Health Ecosystem is a partnership to accelerate the adoption of mobile-health innovations (**Lewis**). Partners include Clinical Commissioning Groups and telecoms, pharma (AstraZeneca), computing and software (Intel) companies and Philips, Robert Bosch Healthcare, Janssen Healthcare Innovation. The EU transfer of knowledge (ToK: 2008-2011) project with Unilever R & D, The Netherlands, *Neuroscience and Food,* has established Manchester as Unilever's strategic partner in sensation, perception and behaviour. Partnerships with AstraZeneca, Servier, Lundbeck and P1Vital (£2M) are investigating imaging biomarkers as a tool for optimising drug development and decision strategy. We have established pre-competitive partnerships with industry: e.g., 8 pharma partners in the EU Innovative Medicines Initiative (Novel Methods leading to New Medications in Depression and Schizophrenia), the largest international academic-industry consortium of its kind.

- *Service users*: Patient and public involvement ensures that for patients our research objectives are relevant, our methods of investigation are acceptable and our research-based recommendations are valuable. Service user involvement in the ACTNoW study (**Bowen**) was selected by the NIHR Stroke Research Network as an example of best practice, included in a recent guide for researchers. **Barrowclough** and Pitt (service user researcher) won an NIHR annual Mental Health Research Network Gold Award for Exemplary Service User Involvement.

2. Developing awareness and training in commercialisation, IP and business engagement
The increasing emphasis on IP protection by the NIHR and RCUK, and the rise of commercial and social enterprises in healthcare delivery has underlined the need to raise staff and students' awareness of IP and to provide training on business engagement. As a result, the number of inventive disclosures made by members of this UoA increased from 23 in 2008-2009 to 49 in 2011-2012, with a total of 94 disclosures, 7 patent applications and 1 licensing agreement over the assessment period to April 2013. Three impact cases include a commercial or social enterprise element (**STORM**; **BIOXYDYN**; **NCISH**). The University of Manchester Intellectual Property (UMIP) facilitates quarterly networking seminars with industrial partners (Pfizer; Philips; Boots; Unilever; Johnson & Johnson) who present their current challenges. We have also participated in the NIHR Invention for Innovation product development competition and RCUK business planning competitions.

3. Public engagement as a pathway to impact is embedded in the institutional infrastructure through Manchester Beacon Network for Public Engagement (http://www.manchesterbeacon.org and http://www.manchester.ac.uk/engagement) which enable researchers to share resources and strategies for engaging with the public and public policy. For example, there are 20 STEM ambassadors (http://www.stemnet.org.uk/) in the Biomedical Imaging Institute which includes many staff connected with this UoA. We have run "Meet the Imaging Scientist" events at *Museum of Science and Industry*, reaching over 1000 visitors, and at *National Science and Engineering Week*, reaching over 800 children a year. Nine imaging science events at schools in the NorthWest have reached over 1000 students in the past 2 years. Scientists in the School of Psychological Sciences run the *Big Brain Summer School:* an annual summer school for year 9 and 10 students to engage them in new learning experiences (800 pupils during this assessment period). We also host Nuffield Research Placements for students in their first year of a post-16 STEM course, providing opportunities to work alongside researchers, to contribute to research and co-author publications (e.g., Food Quality and Preference 22, 42-47).

c. Strategy and plans

The institutional and UoA impact strategy and implementation infrastructure

- The UoM *Strategic Vision 2020* drives planning and investment across the institution. From a base of research excellence, the University realises impact from its research and training by: commercialisation of intellectual property; partnering with businesses; influencing public and health policy; engaging widely with communities; and giving students and staff training and support in enterprise and entrepreneurship. The Faculty of Medical and Human Sciences emphasised its commitment to impact delivery by appointing an Associate Dean for Business Engagement and supporting team with the mandate of ensuring rapid and effective exploitation and commercialisation of research.

- Since 2009, the annual Research Profiling Exercise included identification of socio-economic impact outside academia as part of the research portfolio of academic staff. Knowledge and technology transfer activity is one of four key criteria for promotion. For example, knowledge transfer was a key component of the chair promotion of **El-Deredy**.

- The UoM Innovation Group UMI[3] provides expertise on IP commercialisation and business incubation. UoM Intellectual Property (UMIP) commercialises UoM research results and provides access to venture capital and seed funding. Over the assessment period >£200M has been invested by third parties into UoM spin-out companies and, in March 2008, Europe's largest seed fund dedicated to one University (£32M) was set up (UMIP Premier Fund). Three spin out companies have been set up from this UoA during the assessment period: Storm Skills Training (**STORM** case), Safer Care Ltd and Bioxydyn (**BIOXYDYN** case), securing licensing agreements and significant external investment (>£1.2M to Bioxydyn). Safety Culture Associates Ltd (director, former Manchester Professor, D Parker) was set up in 2008 and continues to grow based on research in this UoA.

Future plans: Focus on impactful research

- Research into early detection, early intervention and prevention is likely to deliver significant socio-economic and health impact, in terms of maintaining employment, well-being and mental health. The UoA's recent major investment in Health Psychology (**Armitage**; **French**; **Skevington**; **Borrelli**) will ensure we lead the way in behavioural change and implementation science to promote healthy lifestyles as avenues for prevention.

- Identification of endophenotypic, imaging markers will provide better targets for personalised medicine and development of novel, mechanism-based interventions, with significant impact through both partnership with the pharmaceutical industry and IP protection and licensing.

Managing the Translational Pipeline

- The re-structuring of the Faculty of Medical and Human Sciences formed centres, research clusters and teams that cover the entire translational pipeline from basic research, through development, testing and evaluation of interventions, to implementation. Ensuring critical mass of diverse research expertise across the entire translational pipeline will facilitate the fast conversion of basic findings into impact.

Managing relationships and impact pathways

- We will continue to engage with research commissioners in the design of research programmes, particularly in Mental Health Services redesign, providing empirical evidence to support service innovation and change with the aim of early, effective intervention.
- We will maintain our effective dissemination of research findings to policy makers and providers, as mechanisms to enhance the impact of our research and to influence policy.
- We will further integrate patient and public involvement in research. MAHSC is developing a strategy and operational policy for service user involvement in mental health research.
- We will work to double our impact-related income from industry sources.
- We will build a portfolio of partnerships with SMEs in readiness for the EU Horizon 2020 framework, particularly in the areas of e-health and m-health. Partnerships with technology SMEs would enable implementation of novel interventions in health and social care.

d. Relationship to case studies

Our eight impact case studies are intended to exemplify the approach taken over the assessment period, the types of impact and key audience and partners.

Case acronym	Title	Delivery
Approach: Changing practice, influencing policy and engaging with policy makers		
ACT NoW	Clinical guidelines for stroke services	Informs clinical stroke guidelines nationally and internationally about interventions which should and should not be delivered.
PARENTING+	Using media-based dissemination of intervention to improve parenting and prevent dysfunction	Established that TV broadcast parenting information changed parenting behaviour. Parent training including video footage has reached c.7 million families in 25 countries.
CUtLASS	Changing attitudes and prescribing practice: cost effectiveness of 1st versus 2nd generation antipsychotic drugs in people with schizophrenia	Impact on clinical guidelines nationally and internationally resulting in more efficient drug prescribing, saving costs without affecting outcomes.
ReduceDUP	Socio-economic impact of reducing the duration of untreated psychosis	Improved outcomes due to reducing duration of untreated psychosis.
NCISH	National Confidential Inquiry into Suicide and Homicide by People with Mental Illness	Reduction in suicide and self-harm.
Approach: Building on relationships with healthcare practitioners and industry		
STORM	Skills Training On Risk Management	Spin out delivers to frontline staff and their organisations nationally and internationally.
CBTPsychosis	Psychological healthcare delivery for people with schizophrenia	Accessible, cost effective treatment of schizophrenia through psychological interventions, assessment measures, treatment manuals and worldwide training.
BIOXYDYN	Magnetic Resonance Imaging Biomarkers	Spin out delivers MRI biomarkers to pharmaceutical industry.