Institution: University of Oxford

Unit of Assessment: 4

a. Context

Our aim is to create world-leading impact that changes clinical practice, helps patients, informs education and social policy, and benefits industry. Our eleven case studies demonstrate attainment of this aim across these domains. To complement and support the efforts of researchers, since 2008 we have created an impact culture, introducing several major initiatives, and developing key structures, processes, policies and relationships. We have particularly strengthened our focus on translational research with impact potential. The Boxes give examples of emerging impacts which are benefitting from these developments. We are also implementing additional plans to further maximise the extent and rapidity of our impacts across all domains in the coming years.

Major initiatives that set the context for our Impact are described in sections **b** and **c**. They include:

- Establishing the NIHR Oxford Cognitive Health Clinical Research Facility, including an 8-bed unit in the *Department of Psychiatry*, new facilities in the *Department of Clinical Neurosciences*, and new facilities for testing and treating patients and training practitioners in the *Department of Experimental Psychology* (the Oxford Centre for Anxiety and Trauma, and the Oxford Cognitive Neuropsychology Centre).
- Linking research programmes to the patient-benefit demands of the Oxford NIHR Biomedical Research Centre, particularly in cerebrovascular disease, cognitive health, Parkinson's disease, and acute vascular imaging.
- Creating a new Clinical Trials Unit in Oxford Cognitive Health to facilitate applied trials.
- Having two Heads of Department in leading roles in their respective NHS Trusts.
- Creating an Impact Committee, including researchers and research users.
- Funding a new post, Research Portfolio Manager, to co-ordinate our impact-related activities.
- Developing cadres of DPhil (PhD) students in externally-funded programmes, each of which has impact at the heart of the doctoral projects.
- Utilising social media and novel technologies to enhance impact, both to the public and globally.

These initiatives have allowed us to enhance our impacts across all our target beneficiary groups:

- ***Driving research-led innovations in health care*** (e.g. via practice guidelines, new diagnostic tests, integration of findings into NHS services, global dissemination).
- ***Impacting upon educational, social, and other policies*** (e.g. influencing government policies on social inclusion and education; influencing decisions of regulatory authorities).
- ***Benefitting industry*** (e.g. via commercialisation of a screening test for antidepressants; using neuroscience to underpin new technologies; new academic-industrial partnerships).
- ***Engaging with and informing the public*** (e.g. via best-selling books and popular websites).

b. Approach to impact

Our approach to impact is multifaceted (Fig. 1). It begins with the setting of strategic priorities, in which the potential impact of the research is a critical element. Priority setting reflects both high-level drivers and evaluations of the needs of our research users. Our key strategic decision, made at the start of the REF period, was to focus on translational neuroscience with clear clinical relevance and with benefits for the NHS. Much of what is described below relates to the ways we have implemented this strategy, and the plans which are underway to progress it further. However, we have not neglected our other research beneficiaries – industry, education, policy makers, public – and we also outline our achievements, progress and plans for impact in those domains. We have introduced a range of structures and processes to ensure that the impact of the resulting research is realised, optimised, and monitored. In total, the changes in culture, personnel and organisation mean that consideration of impact is now an integral part of our work.

b1. Enhancing impact through our research strategy

In 2009 the Medical Sciences Division created the **Neurosciences Strategic Oversight Committee** (**NSOC**) to develop and implement a coordinated research strategy. NSOC, chaired by

Kennard and including Heads of Department, research grouping coordinators, and others, is tasked to actively consider and promote impact. A subsidiary Neurosciences Management Board, which includes more junior researchers, ensures that an impact culture permeates all career stages. In 2011, a Portfolio Manager was recruited from industry by NSOC to implement our impact strategy, and an assistant was appointed in 2012. Despite these advances, we recognised that more steps were required, and hence the **Impact Committee** was formed. Chaired by *Clark*, it reports to NSOC, and comprises senior researchers with a strong impact track record and, crucially, members from industry, charities, and patient groups. The Committee embeds impact at the heart of our strategic planning, and provides a vehicle for direct links with our major research beneficiaries. Its activities include advising researchers on how to increase and follow-through impact, and reviewing major grant applications for their impact potential.

Reflecting the impact strategy, NSOC has overseen recruitment of 10 world-class leaders of translational research since 2008, including *Clark* and *Ehlers (*psychological therapy and its dissemination), *Sharpe* (unexplained medical conditions), *Humphreys, Husain* and *Riddoch* (neuropsychological diagnostics and rehabilitation), and *Snowling* (reading interventions). And, existing Oxford researchers have shifted their research to have an explicit translational focus (e.g. *Foster:* from retinal genetics to circadian rhythms and mental health; *Nobre*: from attentional mechanisms to cognitive aging).

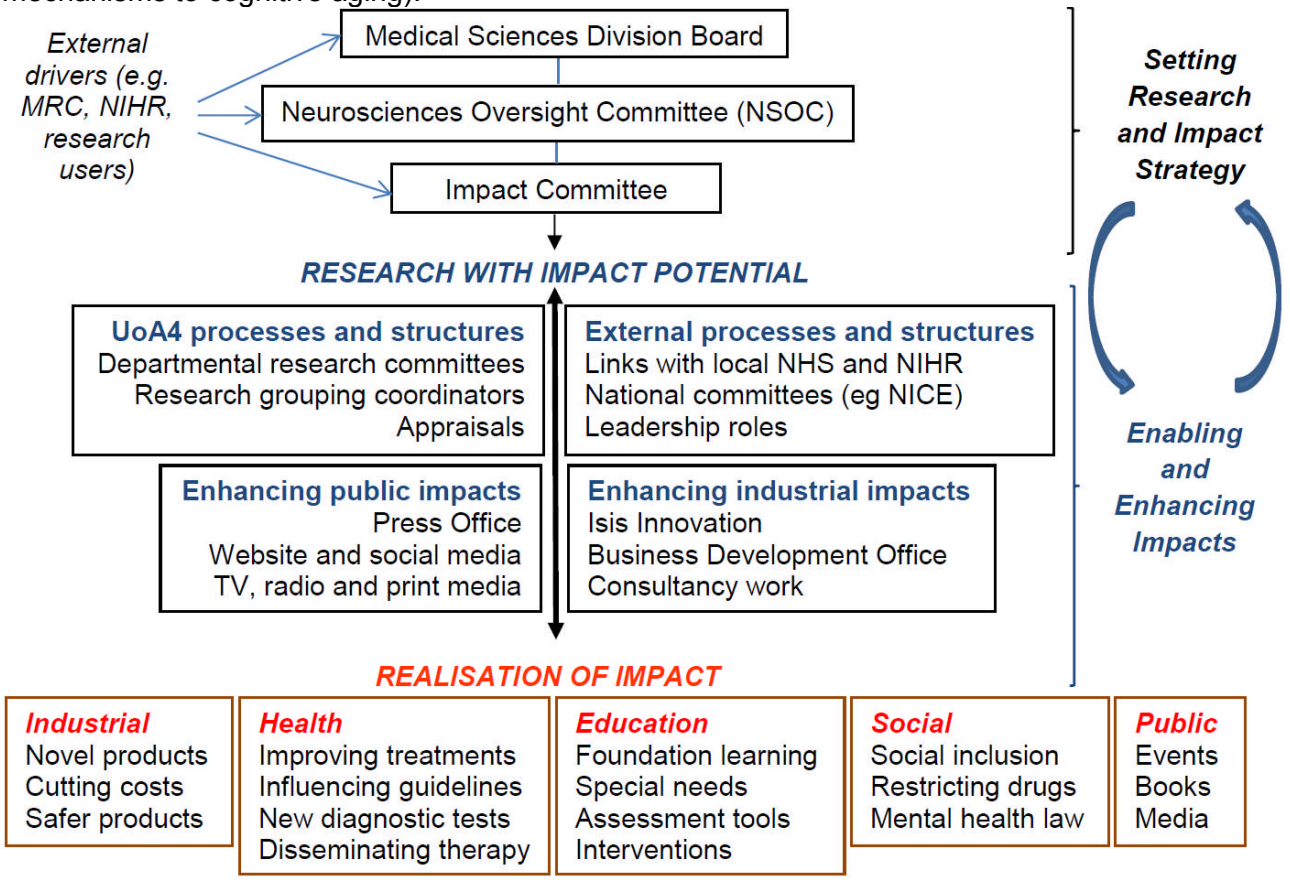

Fig. 1. Our framework for the development, co-ordination and support of impact

b2. Implementing the strategy: Key developments and interactions

Our move towards a translational research profile with impact as a key goal has been enabled not only by these organisational changes and appointments, but by creating new external linkages to ensure that impact opportunities are exploited rapidly and effectively. These have been most profound with the local NHS and with the National Institute for Health Research (NIHR), consistent with our prioritisation of health-related neuroscience research.

b2i: Interactions to facilitate health impacts. We have fundamentally improved interactions with our local Trusts: **Oxford University Hospitals NHS Trust** (**OUHT**, which provides acute medical and surgical care) and **Oxford Health NHS Foundation Trust** (**OHFT**, which provides mental

health and community services), as described in REF5. The formation of OUHT itself, and its academic leadership of clinical services (*Kennard* as Head of Clinical Neurosciences for OUHT, and Head of the University Department), illustrates this integration. Similarly, *Geddes* (Head of the Department of Psychiatry) is also Director of Research and Development for OHFT. The potential of these developments to facilitate impacts from our research is clear (Box 1 gives an example.)

The most significant development to enhance health impacts has been the creation of **Oxford Cognitive Health**, which brings together researchers in the three UoA4 departments (*Experimental Psychology*, *Psychiatry*, *Clinical Neurosciences*), and both NHS Trusts. The aim is to generate a step-change in translational and clinical neuroscience research, with rapid delivery of major benefits for patients. Oxford Cognitive Health has been underpinned by a £3.8M NIHR-funded Clinical Research Facility, opened in 2012, and already having impact on local health care. Box 2 gives one example. Substantial further developments of University-NIHR partnerships to enhance impact are under way. This includes the newly-approved **Oxford Academic Health Science Network** which is prioritising networks in mental health (*Clark*) and dementia (*Geddes*), partnering researchers with clinical service leads and commissioners to speed adoption of our research findings to improve outcomes. Our health-related impacts are furthered by participation in NICE guideline groups and other leadership roles (REF5, section ***e4***).

Box 1. True Colours: monitoring patients with bipolar disorder. *Geddes* and *Goodwin* developed the 'True Colours' text messaging system, allowing patients to text or email their symptoms regularly. Initially a research tool, its clinical utility soon became apparent, and it won NHS 'Innovation of the Year' in 2008. Via *Geddes'* links with OHFT, True Colours was rapidly integrated into the local clinical service, used by 350 patients. Facilitated by our NIHR links, it is now being extended to other teams and NHS Trusts, and is part of our new CLAHRC award (see section ***c2***). International roll-out, and commercialisation, are planned.

Box 2. Cognitive screening after stroke. *Humphreys* and *Riddoch,* collaborating with the Stroke Association, have pioneered the first cognitive screening tool for stroke: the BoCS battery. It is used by services in Thames Valley and Hertfordshire, and a new screen (in tablet form) is standard clinical practice in Oxford hospitals. Over 300 therapists have been trained. International versions are used in China, S. Korea, Belgium and Germany. Screens for more detailed assessment (BCoS2) and for social cognition (BCoS-social) are being rolled-out through Oxford Cognitive Health and Isis Innovation.

b2ii. Interactions to facilitate industrial impacts. These include:

- In 2012 the University signed a £3.6M strategic alliance with UCB Pharma in neuroinflammation, facilitated by the *Business Development Office*.
- With *Isis Innovation*, the University's technology transfer company, since 2008 we have filed 13 patent applications (e.g. on vessel wall imaging, gene therapy). We have negotiated 16 licence agreements (e.g. for image analysis software to 5 major companies), worth £1.98M. 58 confidentiality agreements and 150 material transfer agreements have been signed.
- Establishing an EU Initial Training Network with industrial partners (e.g. BrainProducts, Siemens, Psychology Press) who sit on our management board and contribute to our training.
- Consultancy and advisory work is encouraged, and supported by Isis Innovation. E.g. *Jezzard, Smith* and *Tracey* consult with Siemens; *Spence* works with Nestlé, Unilever and Toyota.

b2iii. Interactions to facilitate social, policy and educational impacts. Researchers are actively encouraged to contribute to advisory bodies, agencies, government departments, etc. The case studies contain examples. Others include:

- *Clark* (with Lord Layard, LSE) has led the **Improving Access to Psychological Therapies** (**IAPT**) programme, a £260M annual NHS investment (see ***d***).
- *Williams* (2013) taught Mindfulness-based cognitive therapy to MPs and Peers, and advised the Prime Minister on its implementation in schools.
- *Snowling* advises the Department of Education on reading and dyslexia, and works with charities involved with children with special needs.
- *Hewstone* works closely with the Department of Communities and Local Government, and with

the Northern Ireland Office, to implement his research on community cohesion and integration.
- *Burns* has advised the Department of Health on the implications of his recent trial showing that Community Treatment Orders do not reduce re-admissions.

b2iv. Interactions to facilitate public impacts. We actively engage with the public through a range of media and events, supported by various agencies and resources.
- Several researchers have written books on their work. *Williams*' '*Mindfulness: Finding Peace in a Frantic World'* (2011) has sold 125,000 copies in 19 languages. His 2007 '*The Mindful Way through Depression'* remains the best seller in Amazon's Psychiatry and Depression categories.
- Using social media. *Freeman's* website '*Overcoming Paranoid and Suspicious Thoughts'* had 80,000 hits from 177 countries in 2012. *Williams* has made six Mindfulness podcasts since 2011, downloaded 210,000 times. *D Bishop* was runner-up 'Science blog of the year' 2012, has over 11,000 followers on twitter and, with *Snowling*, set up a YouTube channel to raise public awareness of language impairments which has had over 100,000 hits.
- *Foster* organised the Festival of Neuroscience in London in 2013, at which *Tracey* gave a public lecture on her research. *Foster* has also chaired the Cheltenham Science Festival since 2010.
- The Oxford Neuroscience website (www.neuroscience.ox.ac.uk) was upgraded in 2012, and includes sections for dissemination of research. The Oxford Neuroscience *e-mailbox* attracts public enquiries, e.g. 100 about *Maclaren's* blindness research.
- Annual open days, including those run by the Centre for Functional Magnetic Resonance Imaging of the Brain (over 800 visitors in 2012). In 2013 our 'Revealing the Brain' exhibition in the Museum for the History of Science, ran for 12 weeks, had 2870 visitors, and led a TV company to approach us to make a programme about the exhibits.
- Our research features regularly in news and documentaries on TV, radio and in print.
- Translational research groupings have user panels including patients, carers, and charity representatives to help set research priorities, and advise on dissemination.

c. Strategy and plans

c1. Future impacts: Developing strategy, redefining goals, raising aspirations

Building on the step-change in our approach to, and achievement of, research impacts since 2008, we continue to work actively to develop our strategy further. Our goals are to:
- *sustain and strengthen our focus on translational research with the greatest impact potential;*
- *provide the optimal environment to support researchers to achieve this potential fully.*

Initiatives to achieve these goals include:
- Growing the scope and influence of the Impact Committee. For example, a budget allocated by NSOC for researchers to explore, facilitate, or measure impact of a project. Also regular impact workshops to share information and good practice.
- Ensuring (via Heads of Department, and Colleges) that impact pervades research committees and groupings, with pathways to reward researchers, and a focus on 'impact follow-through'.
- Consideration of impact covered in staff appraisals, including discussion and encouragement for researchers to take on appropriate leadership roles.
- NIHR Senior Investigators are explicitly allowed to use the funds that NHS Trusts receive on their behalf via Research Capability Funding, for translational research.

c2. Enhancing health-related impacts

We will continue to prioritise health-related impacts and enhance them by further developments:
- In August 2013 we were awarded a £9M **Collaboration for Leadership in Applied Health Research and Care** (**CLAHRC**), focusing on dementia, early intervention for psychosis, self-management in bipolar disorder and co-morbidities between physical and mental health. It includes applied health researchers, commissioners, clinicians, patients, and public.
- We have recruited *Lovestone* from KCL (from February 2014) to lead our dementia strategy. We anticipate significant global impacts resulting from this initiative over the next five years.
- To further expand our NIHR-related impacts, we have been shortlisted for an **Oxford Academic Health Science Centre**, within which UoA4 research is a key component.
- A Centre for Neurorehabilitation, which will link fundamental and translational research with

biomarker development and clinician training.
- A new Wellcome-funded close-to-patient DPhil scheme in mental health for clinicians, to include hands-on experience with researchers who have achieved major health impacts.
- To enhance our global impact, via internet-based therapies for psychological disorders (Box 3), the use of tablets and other devices to deliver assessment and treatment (e.g. Boxes 1 and 2) and through international research programs (e.g. mental health consequences of HIV: *Stein*).

Box 3. Disseminating effective psychological treatments into health services is a major problem. With a Wellcome Strategic Award, *Fairburn* is developing internet-based therapist training programmes to be used (inter)nationally. *Clark, Ehlers* & *Fairburn* are developing and evaluating internet versions of their NICE-recommended therapies for several disorders, for global reach, using Oxford Cognitive Health as a vehicle to take this forward. *Clark* also assists NHS England to expand the IAPT initiative in his role as Clinical and Informatics Advisor.

c3. Enhancing impacts in social, educational and industrial domains

- *Snowling* and *Nation* are working with Oxford University Press to develop reading materials for dyslexia assessments.
- Establishing new graduate training for industrial partners in the food industry (*Spence*).
- The recent partnership with UCB Pharma mentioned (***b2ii***) is already being expanded to include psychiatric studies. The first such grant (£600K, to *Harmer*) was awarded in August 2013.
- Extended collaborations with P1Vital (see section ***d***).
- Graduate training schemes in which awareness and development of impact is integral to the programme. These include MoD-funded studentships; our new impact-oriented Marie Curie Initial Training Network in Individualised Diagnostics and Rehabilitation; our new Wellcome-funded clinical doctoral programme in mental health; and our participation in the ESRC Doctoral Training Centre which supports internships to government, charity and industry giving early exposure of doctoral students to these key areas of impact.

d. Relationship to case studies

Our case studies reinforce and reflect our commitment to translational research, and to the investment, partnerships, and activities necessary to ensure that the resulting impacts occur.

- Four case studies (*Fairburn*, *Ehlers*, *Clark*, *Sharpe*) show that cognitive therapy is the most effective, and NICE-endorsed, treatment for several common psychological disorders. Their success was a major impetus to create Oxford Cognitive Health, its Clinical Research Facility, and the relevant strategic appointments, as well as our recent success in applications for the Academic Health Science Network and CLAHRC. The major impact of *Clark* and *Ehlers'* work on IAPT (section ***b2iii***) is continuing and extending, with *Clark* centrally involved in the assessment of IAPT outcomes and shaping the future growth of the programme.
- Two case studies (*Vincent* and *Beeson*) involve new diagnostic tests for neurological disorders and have highlighted the benefits of close links with NHS for getting research outputs into clinical practice, as well as interactions with leading clinical academics elsewhere to impact on practice in the wider NHS and abroad. Similarly, *Rothwell's* case study on stroke prevention led to rapid NHS impacts: an emergency minor stroke service was introduced locally within a year, soon followed by NICE guidelines and the Department of Health Stroke Strategy which mandated a national roll-out of the service model.
- *Goodwin and Harmer's* work with P1Vital Ltd. showed us how to develop a mutually beneficial academic-commercial partnership to achieve impact (and avoid potential conflicts). The experience was invaluable in persuading UCB Pharma to extend their University partnership to include cognitive enhancement. Increased interactions with P1Vital are underway, including testing a novel mood-stabilising drug identified by basic scientists in Oxford.
- The *Hewstone* and *Hawton* case studies show the importance of interacting with policy makers (e.g. Northern Ireland Office, European Medicines Agency), if impacts with societal implications are to be maximised. This awareness underpins our increased support for researchers to engage with relevant authorities (e.g. via initiatives of the Impact Committee [section ***b1***]).