

Research Assessment Exercise 2020

Impact Overview Statement

University: The University of Hong Kong (HKU)

Unit of Assessment (UoA): 03 - Clinical Medicine

Total number of eligible staff of the university in the UoA: 198

(1) Context

Research in this Unit of Assessment is undertaken within the LKS Faculty of Medicine, working seamlessly across over-arching research groups (Cancer, Emerging Infectious Diseases, and Stem Cell, Development & Regenerative Medicine), focusing on translational and clinical research. Fundamental to our research is its potential impact on patient care and outcomes, health and well-being of the local and global population, health care delivery and commercial enterprise, addressing issues of importance to policy-makers, practitioners and the public. Our strategy is to deliver ground-breaking translational, clinical and public health research, pioneering treatments for patients across a wide range of specialties (e.g. treatment of hepatitis B and its related complications) and conditions and influencing local and global public policy (e.g. prevention of influenza). This is achieved through focussing on our areas of strength in collaboration with clinical colleagues (e.g. clinical management of scoliosis with the latest technologies). Our research groups have critical mass and work in close relationship with national and global policy makers leading to excellence in the delivery of health benefits worldwide (e.g. Professor Keiji Fukuda, School of Public Health, has been involved in various advisory bodies in World Health Organisation (WHO), and Chinese Centre for Disease Control and Prevention (Chinese CDC)).

Through the translation and application of our research endeavours, the main non-academic users and beneficiaries of our research are:

- Patients, especially those with diseases that are prevalent in the region such as hepatitis B and thalassaemia, through the implementation of research to improve health outcomes, reduce morbidity and mortality.
- General public through provision of cost-effective and quality healthcare services, and education to improve social awareness. Examples include the screening of thalassaemia and diabetic complications, and public awareness campaign about schizophrenia.
- Commercial enterprises through partnerships with established companies. One such major advance is the clinical demonstration of the safety and efficacy of magnetically controlled growing rods in scoliosis treatment developed by a technology company, NuVasive. Another example is the leading of multinational trials for pharmaceutical companies such as those on nucleoside analogues for the treatment of hepatitis B infection.
- National and international health policy makers by providing evidence to inform policies, including those of the WHO, and the Food and Health Bureau (FHB) of Hong Kong, on influenza vaccination and the control of other emerging infectious diseases.

(2) Approach to impact

Our approach to impact is underpinned by a strong commitment to knowledge exchange and translation with academics working directly with the beneficiaries of research, from study inception to policy implementation.

- **Advising administrators on healthcare policy for the benefit of various stakeholders**

Many staff are chairs or members of international and national policy and other health-related groups, enabling us to understand the issues of importance to patients, public, clinicians, industry, voluntary organisations, and policy makers. Through these channels, we would also be able to utilize our research outputs to inform healthcare policy. One notable examples is the appointment of Professor Malik Peiris, School of Public Health, as an Advisor to the WHO International Health Regulations Emergency Committee concerning Middle East respiratory syndrome coronavirus.

- **Working closely with policy makers for adoption of our research**

Researchers work closely with health administrators to facilitate the adoption of our research through development of clinical infrastructures and execution of health care plans. The implementation of territory-wide diabetic retinopathy screening programme in Hong Kong is made possible through our research work in primary care of diabetic patients and collaboration with the Hospital Authority.

- **Engaging the public**

We have contributed substantially to campaigns for awareness of health issues and the benefits of research. For example, our research and campaigns on psychotic disorders have led to a better understanding of the disease by the public, resulting in the adoption of a non-derogative Chinese terminology for psychosis in the Chinese community regionally and willingness of people to seek professional help early.

- **Working and collaborating with healthcare providers**

We have also collaborated fully with healthcare providers to maximise the proximity (and, where possible, co-location and even organisational integration) of our researchers with practicing clinicians. This assists bench to bedside research, and the identification of clinical problems requiring basic research (i.e. back-translation of research). This enables staff to exploit wider opportunities. For instance, in the School of Public Health, basic scientists, epidemiologists and clinicians work closely to define the phylogenetic evolution of influenza viruses and to propose measures to prevent pandemics of influenza including the selection of strains to be included in vaccine. Furthermore, we also provide training to other healthcare providers to enhance dissemination of our research impact e.g. the Department of Surgery has provided training fellowships for overseas doctors on liver transplantation.

- **Promotion of importance of impact in research among staff**

We have appointed an Associate Dean in Research, supported by a team of dedicated staff, to oversee and review impact at the individual and research group level, and to generate impact strategy. Staff are encouraged to undertake impact-driven research to improve patient health and clinical practice, contribute to the development of new therapeutic approaches, to inform policymakers and raise public awareness of our research. These activities form an important part of the annual faculty resource allocation process and is included in academic staff performance reviews. Competitive funding for KE projects has been introduced to enable staff members to undertake projects that are underpinning by HKU knowledge and have the potential impact on non-academic sectors. The success of individuals and groups in terms of achieving excellence in activities relevant to impact are fully recognised by Faculty-level communications through awarding of Faculty KE awards and publicizing in Faculty newsletters and websites, which are accessible by the public. For example, the project “Internet-based Guide to the Management of Spinal Deformities: The AO Surgery Reference” led by Professor Kenneth Cheung, Department of Orthopaedics & Traumatology, was awarded the Faculty and University KE Awards in 2016 and the app has been installed on 200,000 smartphones globally by surgical trainees.

- **Use of University and external resources to achieve commercial impact**

The Technology Transfer Office (TTO) supports seed funding, innovation, impact and commercial contacts. For example, the TTO has been instrumental in the patent application and commercialization of an oral formulation of arsenic trioxide Arsenol[®], invented by Professors YL Kwong and CR Kumana of the Department of Medicine, for the treatment of acute promyelocytic leukaemia. This research was also awarded a Gold Medal at the 46th International Exhibition of Inventions of Geneva in 2018.

We also collaborate and work in partnership with the Hong Kong Science and Technology Park (HKSTP) on impactful innovative research. One recent initiative, led by Professors HF Tse and Eric Tse of Department of Medicine, is the building of a GMP-standard laboratory in the Faculty of Medicine to provide a research platform for human cell-based therapy clinical trials. The HKSTP will contribute approximately HKD 24 million in the project. A project on human induced pluripotent stem cell-derived mesenchymal stem cells for heart failure led by Professor HF Tse is in the pipeline.

(3) Strategy and plans

The University's Vision 2016-2025 is to embed impact into all of our research outcomes. We will make a paradigm shift to focus on and reward research innovations that benefit communities and transform global technologies. This shift will acknowledge material outcomes and leadership in our impact endeavours and add transformational value to the global society. We will measure the tangible benefits we bring to the global as well as local, mainland China and broader Asian communities.

The aim is to promote research that generates impact and to develop a tailored platform for impact, which is reflected in the strategic and operational plans of Faculty.

This will be achieved by

- providing more opportunities for outcomes-driven translational research. Basic and translational scientists have been recruited in clinical departments to enhance interaction between scientists and clinicians (e.g. Dr. Kelvin Yeung in the Department of Orthopaedics & Traumatology). Furthermore, the HKU Phase 1 Centre has been established specifically to facilitate the running of early-phase or phase 1 clinical trials. For example, the success of the phase I study of nivolumab for advanced hepatocellular carcinoma (HCC) has led to the initiation of a phase III randomized study of nivolumab versus sorafenib for HCC, which is still on-going.
- supporting and awarding research projects that engage the community and make accessible the knowledge needed to enhance human well-being. Separate funding will be available for impact projects through a dedicated Knowledge Exchange Funding Exercise.
- educating, nurturing and developing the next generation of academic scholars, eminent professional, research pioneers and society leaders. Working with other organisations including the Croucher Foundation and the Li Shu Pui Memorial Foundation, we secure extra funding to provide fellowships and grants to support our clinical staff in their research.
- Collaborating with other academic or industrial partners to enhance translational research. For example, HKU and the Guangdong Pharmaceutical University (GDPU) has jointly launched the GDPU-HKU Innovations Platform (the Platform) in Zhongshan China to collaborate on bio- and health technology and translational medical research and development in Guangdong-Zhuhai-Macau Greater Bay Area. The Innovation Platform is to take part in and ride on the "Healthy China 2030" blue print and other national strategic documents to delineate the development plan of bio-medicine in China, which will capacitate the growth of its medical health industry to RMB 8 trillion by 2020 and RMB 16 trillion by 2030.

(4) Relationship to case studies

The seven submitted case studies epitomise our approach to impact. Their hallmarks include: close integration between lead researchers and a wide range of beneficiaries from research inception to results implementation; high quality evidence leading to new, reliable knowledge published in high impact journals; implementation via provision of quality clinical care to patients and training to clinicians locally and internationally.

"Transforming the global health care management of chronic hepatitis B" and *"Improving worldwide survival of adult-to-adult right living donor liver transplantation"* illustrate how our world-leading research have led to the development of a practice-changing treatment approach for a disease that is prevalent in our region and impacted on clinical management guidelines worldwide. *"Transforming local and global responses to emerging infectious diseases"* worked with policy makers as expert advisors and contributed to changes in policy in the control of human influenza and coronaviruses infection locally and internationally. *"Discovery of novel coronaviruses with public health significance"* and *"Novel technology in the treatment of early onset scoliosis"* engaged with biotechnology companies in the development of laboratory reagents for rapid virus detection and new instrumentations for scoliosis treatment respectively. *"Normalisation of universal diabetic complications screening in Hong Kong"* and *"Transforming the outcomes and intervention approaches of psychotic disorders locally and globally"* worked with policy makers and governments to ensure accurate translation of their evidence into policy and health programme implementation, and engaged the public to improve health awareness.