# Health Research Symposium 2017: creating knowledge in complex system for sustainable community health

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The Health Research Symposium 2017 was held on 16 June 2017 at the Hong Kong Academy of Medicine Jockey Club Building. The Symposium was organised by the Food and Health Bureau and commemorated the 20th anniversary of the establishment of the Hong Kong Special Administrative Region. The event provided a platform to facilitate dialogue among local researchers on their latest achievements in health-related research and learn from international experiences. It aimed at setting a benchmark for excellent research in health and medicine and fostering collaboration in research to improve the health of the population. The Symposium was attended by more than 500 delegates, including 200 poster presenters. Dr Ko Wing-man, the Secretary for Food and Health, opened the Symposium by welcoming the keynote speakers, distinguished guests, and other participants. Dr Ko presented souvenirs to the keynote speakers.

The Symposium commenced with a short video 'About Health and Medical Research Fund'[1] that described the evolution and significant role played by the Health and Medical Research Fund in generating evidence-based knowledge for informing health policy and healthcare services in Hong Kong. Informative studies were highlighted and the contribution of key stakeholders was acknowledged.

## Keynote Session 1 (Moderator: Prof Gabriel Leung)

*Dr Douglas Bettcher*

Director, Department for Prevention of Noncommunicable Diseases, World Health Organization, Geneva, Switzerland

**Research on noncommunicable diseases**

Dr Bettcher was unable to attend in person and provided a short video clip that was played at the Symposium.[2] Dr Bettcher noted the increasing threats posed by noncommunicable diseases, which remain the largest killer in the world. In 2015, 39 million people died needlessly from noncommunicable diseases, of which 15 million died from conditions involving modifiable risk factors such as tobacco use, unhealthy diet, lack of physical exercise, and misuse of alcohol. The World Health Organization and communities around the world can change this by focusing on prevention, best practices, and cost-effective treatment and screening. Dr Bettcher acknowledged Hong Kong's efforts to restrict tobacco use by requiring health warnings and graphic images to cover 85% of the surface area of cigarette packages, which allow consumers to make more informed health choices.

*Prof Sally Wyke*

Deputy Director (Social Sciences), Institute of Health and Wellbeing, The University of Glasgow, United Kingdom

**Systematic development and evaluation of complex interventions to improve health: a route to success?**

Prof Wyke observed that with so many interventions in healthcare it was surprising that so little attention was paid to their development, or to the feasibility of implementing them. She outlined a pragmatic guide to developing complex interventions developed by the University of Glasgow. She identified six crucial steps in designing an intervention: (1) defining and understanding the problem and its causes, (2) identifying modifiable factors, (3) deciding the mechanisms of changes, (4) clarifying how change will be delivered, (5) testing and adapting the intervention, and (6) collecting evidence for rigorous evaluation. Prof Wyke illustrated this approach with reference to the CARE Plus study in Scotland, which addressed the problem of poor health outcomes in people with multi-morbidity.

## Keynote Session 2 (Moderator: Prof Francis Chan Ka-leung)

*Prof Louisa Jorm*

Director, Centre for Big Data Research in Health, The University of New South Wales, Australia

**Big data in health and medicine: issues and challenges**

Professor Jorm described how health and medical big data come from a wide variety of sources. These data are characterised as big in volume because they include large numbers of individual records and/or variables. They are also characterised by variety, as they often include structured and unstructured data such as free text or images. Additional complexity arises as data are often generated in real time. Prof

Jorm described the challenges in making use of such data, which include ensuring data quality, the increasing velocity of data flows and the rapid introduction of new medical technologies. One of the biggest challenges is the need to protect privacy and maintain confidentiality.

*Dr Alain Labrique*

Director, Johns Hopkins University Global mHealth Initiative, United States

**What is mPossible? Leveraging mobile technology for community health and global health systems**

Dr Labrique defined mHealth as a broad term to capture innovations at the intersection of mobile communications and health. As the number of mobile phone subscriptions is equal to the entire human population, it is now possible to help improve the efficiency, coverage, quality, and reach of essential maternal, newborn, and child health services, especially in hard-to-reach populations in low- and middle-income countries. Dr Labrique reported that over the past decade, hundreds of innovative projects have been tested to identify mHealth strategies that can help resolve persistent health system challenges. As the coverage of the mobile phone infrastructure increases, costs will fall and mHealth solutions will be increasingly used to strengthen public and clinical health.

## Parallel Session 1: Health and Health Services (Moderator: Prof Yeoh Eng-kiong)

*Dr Colman Fung Siu-cheng*

**In-depth cost-effectiveness study of the multidisciplinary Risk Factor and Management Programme of the Hospital Authority**

The multi-disciplinary Risk Factor Assessment and Management Programme-Diabetes Mellitus (RAMP-DM) of the Hospital Authority is designed to enhance management of diabetic patients in the primary care setting. Dr Fung and colleagues evaluated the cost-effectiveness of RAMP-DM compared with usual care in the primary care setting. They found that RAMP-DM was cost-saving from both health provider and societal perspectives. This means that the cost of the RAMP-DM (including the programme cost, the subject's own costs of private healthcare utilisation as well as non-medical costs associated with the programme) were offset by the savings in public medical resources required due to reduction in complications as a result of the programme.

*Dr Chang Wing-chung*

**Sustainability of treatment effect of a 3-year early intervention programme for first-episode psychosis in Hong Kong**

Dr Chang observed that early intervention has been shown to be better than standard care in improving clinical and functional outcomes of patients with first-episode psychosis. This study examined the sustainability of superior treatment effects of extended early intervention versus standard care on illness outcomes 2 years after the end of early intervention. They found that superior treatment effects of extended early intervention in terms of functioning, symptom severity, service utilisation, and occurrence of risk behaviours were not sustained 2 years after service withdrawal.

*Dr Dorothy Chan Fung-ying*

**Lifestyle intervention in obese Chinese adolescents with nonalcoholic fatty liver disease: a randomised controlled trial**

Dr Chan noted that the prevalence of nonalcoholic fatty liver diseases in children is increasing. This study evaluated the efficacy of a counselling-based lifestyle modification programme for such adolescents. Overall, 52 post-pubertal Chinese adolescents aged 14 to 18 years with primary obesity were randomised to either a lifestyle modification programme or usual care. The primary outcome was change of intra-hepatic triglyceride content. Ten subjects (six intervention, four control) achieved complete remission of the disease after 16 weeks. A significant reduction in body fat was seen in the intervention group compared with the control group at 16 weeks. Dr Chan concluded that a lifestyle intervention of 16-weeks was effective in reducing body fat and intra-hepatic triglyceride content.

*Prof Bian Zhao-xiang*

**Chinese herbal medicine (Ma Zi Ren Wan) for functional constipation: a prospective, double-blinded, double-dummy, randomised, controlled study**

Prof Bian noted that functional constipation was a common clinical complaint. This study evaluated the efficacy of Ma Zi Ren Wan versus first-line western therapy (Senokot) in a randomised controlled trial comprising 8-week treatment with 8-week follow-up in 843 subjects. The primary outcome was complete spontaneous bowel movement. There were no severe adverse events during treatment or follow-up. Prof Bian reported that Ma Zi Ren Wan was safe and effective for alleviating functional constipation compared with Senokot and placebo.

## Parallel Session 2: Advanced Medical Research (Moderator: Prof Lau Yu-lung)

*Dr Xiong Li*

**Autonomic dysfunction as measured by Ewing's battery test to predict poor outcome after acute ischaemic stroke**

Dr Xiong observed that central autonomic dysfunction increases the risk of mortality after

stroke. This study investigated whether the severity of autonomic dysfunction as classified by Ewing's battery test could predict poor outcome after acute ischaemic stroke. Overall, 150 consecutive ischaemic stroke patients were recruited within 7 days of symptom onset. Of these, 114 (76%) were classified as having severe autonomic dysfunction by Ewing's battery test. Three months later, poor functional outcome was found in 32.5% of severe group patients compared with 13.9% of the minor group. Thus, Dr Xiong concluded that the severity of autonomic dysfunction as measured by Ewing's battery test predicted poor clinical functional outcome after acute ischaemic stroke.

*Dr Maria Wong Pik*

**Uncovering resistant genes in epidermal growth factor receptor–mutated lung adenocarcinomas prior to targeted therapy**

Lung cancer is the most lethal malignancy in the world. Lung adenocarcinomas are frequently driven by activating mutations in the epidermal growth factor receptor (EGFR). Tyrosine kinase inhibitors (TKI) are used to treat mutant cancers but drug response is impaired by the presence of resistant mutations. Dr Wong and colleagues conducted whole exome mutation profiling of 39 EGFR mutant lung adenocarcinomas and compared the TKI response pattern of 16 responders and 23 non-responders. The study found that known and candidate TKI-resistant mutations could be revealed by sequencing of pre-treatment excision specimens. The specific mutations identified in individual tumours could be useful for personalised medicine.

*Dr Eddie Ma Chi-him*

**Persistence of ciguatera fish poisoning and its associated neurological manifestations in mice**

Ciguatera fish poisoning is caused by ingesting fish contaminated with ciguatoxin and affects over 50 000 people worldwide every year. Dr Ma and colleagues investigated the neurotoxicity of pacific ciguatoxin-1 at doses relevant to human exposure on nervous system repair, functional recovery, and neurotransmitter metabolism in mice. This study provided the first evidence that persistence of pacific ciguatoxin-1 in the peripheral nervous system reduces the intrinsic growth capacity of peripheral neurons, resulting in delayed functional recovery and irreversible motor deficits after injury.

*Dr Maria-Mercè Garcia-Barcelo*

**Uncovering genetic lesions underlying the most severe form of Hirschsprung disease by whole genome sequencing: a pilot study in eight family trios**

Hirschsprung disease is a rare congenital disorder characterised by the absence of enteric neurons along a variable length of the distal intestine. Genetic variations associated with common and milder forms of the disease have been characterised, but many severely affected patients do not have mutations in known Hirschsprung disease genes. Dr Garcia-Barcelo and colleagues aimed to understand the genetic architecture underlying the disease by studying sporadic patients with severe Hirschsprung disease. Family trios (unaffected parents and affected probands) were screened by whole genome sequencing. Pathway analysis indicated that the extracellular matrix receptor pathway was significantly shared by the patients. However, the pronounced genetic heterogeneity observed indicated that genetic counselling is not advisable at this time.

## Parallel Session 3: Health Promotion (Moderator: Dr Felix Chan Hon-wai)

*Prof Lam Tai-hing*

**Promotion and brief interventions of smoking cessation at the smoking hotspots**

Prof Lam and colleagues conducted a smoking cessation promotion at 14 smoking hotspots, ie outdoor areas with a large number of smokers who gather to smoke and with rubbish bins for cigarette butt disposal. These hotspots are usually located at bus stops, entrances to commercial buildings and shopping malls. Forty university student ambassadors were trained with knowledge of tobacco control, smoking cessation and techniques to approach smokers at hotspots. The ambassadors proactively delivered brief intervention, measurement of exhaled carbon monoxide level, brief advice and invitation for telephone follow-up. As a result of the promotion programme, 3096 smokers were approached. Of these, 916 received brief smoking cessation advice and 210 smokers consented to further telephone follow-up. In all 1285 smokers who received any intervention, the self-reported quit rate was 1.2%.

*Ms Sania Yau Sau-wai*

**'We Wrap': an innovative empowerment and education programme for people with mental health challenge and young people**

The Wellness Recovery Action Plan was developed in the United States as a system of physical and mental health that focuses on hope, personal responsibility, learning and maintaining your own ideas and rights. The plan focuses on training participants using specially developed materials to learn to cope with different changes in life, maintain positive thinking and mental well-being. Youth participants exposed to the programme had significantly better enhancement in hope, empowerment, mental well-being, personal confidence, willingness to ask for help, goal and success orientation, self-care and self-efficacy compared with those in the control group.

*Mr Wilfred Wong Hing-sang*

**A geographical study of child injury in Hong Kong: spatial variation among 18 districts**

This study aimed to provide a comprehensive comparison of accident and emergency department attendance rates related to child injury among 18 districts from 2001 to 2012. It also explored the relationship between child injury and socio-economic status. During the period under study, there were 742 552 child injuries leading to accident and emergency department attendance in Hong Kong resulting in direct medical costs of HK$43 million per year. There was wide variation between districts with respect to injury rate and risk of different injury type. Higher socioeconomic status was associated with lower risk of injury. The project team suggested the current injury database could be integrated with other databases that would reveal the true injury burden and allow resource planning.

*Ms Sharmila Gurung*

**Every woman counts: cancer prevention amongst ethnic minority women**

Ethnic minorities are vulnerable in Hong Kong and their health needs are often overlooked. The aim of this promotion programme was to raise breast and cervical cancer awareness amongst ethnic minority women, increase the uptake of Pap smear screening, and increase the uptake of healthy lifestyles. A group of 21 peer educators of different backgrounds, nationality, religion, and age were trained. Together these peer educators reached over 800 participants. The peer educator method was successful in increasing knowledge of cancer prevention, increasing uptake of Pap smears, exercise habit, and consumption of vegetables. In addition, 86% of participants shared the message with one to three friends.

## Parallel Session 4: Infectious Diseases (Moderator: Prof Yuen Kwok-yung)

*Prof Ivan Hung Fan-ngai*

**Efficacy of a combined influenza and 23-valent pneumococcal polysaccharide vaccines in patients with chronic illness**

Pneumococcal and influenza infections can cause serious morbidity and mortality in elderly populations. Dual vaccination with 23-valent pneumococcal polysaccharide vaccine and trivalent influenza vaccine can reduce hospitalisation and death. Prof Hung and colleagues followed up two groups of subjects with chronic illness: those aged 50-64 years and those aged ≥65 years. Among those aged 50-64 years, there were fewer hospitalisations among dual vaccine recipients for respiratory, cardiovascular or cerebrovascular diseases compared with other groups. Among the elderly aged ≥65 years, there were significantly fewer deaths, cardiovascular events, pneumonia, and intensive care unit admissions among the dual vaccine recipients compared with the other groups. Prof Hung concluded that both vaccines should be considered as part of the vaccination programme for the elderly with chronic illness.

*Prof Paul Chan Kay-sheung*

**Human parechovirus infection in Hong Kong neonates, infants and young children**

Prof Chan noted that the epidemiology of human parechovirus in Asia remains obscure. He and his colleagues determined the prevalence, seasonality, type, distribution, and clinical presentation of human parechovirus among ~3900 children aged 3 years and younger hospitalised for acute viral illness in Hong Kong. Prof Chan reported the prevalence of human parechovirus in children under 3 years as 2.3%. A clear autumn-winter seasonality was observed, with type 1 virus being most common. The clinical presentation ranged from mild gastroenteritis, upper respiratory tract infection, and febrile rash to convulsion and severe sepsis.

*Dr Joseph Wu Tsz-kei*

**Evaluating the health economics of routine female adolescent human papillomavirus vaccination for reducing the burden of cervical cancer in Hong Kong**

Infection with human papillomavirus (HPV) increases the risk for cervical and other cancers. HPV vaccines can prevent the most common types of infection. Dr Wu and colleagues evaluated the health and economic impact of routine female adolescent nonavalent HPV vaccination on reducing the burden of cervical cancer in Hong Kong. A model was developed using local epidemiological data. When the duration of vaccine protection was 20 years and vaccine uptake was 75%, it was found that for routine vaccination to be cost-beneficial the cost for fully immunising one girl would need to be lower than HK$1738 under the human capital approach and lower than HK$2499 under the quality-adjusted life-year monetisation approach.

*Dr Wong Ngai-sze*

**Modelling the impacts of pre-exposure prophylaxis intervention on the HIV epidemic in men who have sex with men in Hong Kong**

Pre-exposure prophylaxis (PrEP) is a biomedical preventive measure that could significantly reduce sexual transmission risk of HIV infection. Men who have sex with men account for a large proportion of HIV infections in Hong Kong. Dr Wong and colleagues aimed to simulate the impact of PrEP intervention through mathematical modelling. The results showed that the HIV epidemic in men who have sex with men in Hong Kong is expected to

grow. Implementation of PrEP in the community would avert new infections and control the epidemic. The degree of impact of PrEP would depend upon population coverage, adherence, affordability, public awareness and acceptance.

## Award ceremony

The Symposium ended with an award ceremony to acknowledge outstanding research whose outcome has influenced health policy and practice in Hong Kong. The award recipients were as follows:

### Excellent Research Awards

| Principal applicant | Project title |
|---|---|
| Dr Agnes Lai Yuen-kwan<br>The University of Hong Kong | Long-term efficacy of extended education programme on improving treatment adherence to continuous positive airway pressure in obstructive sleep apnoea |
| Prof Vincent Mok Chung-tong<br>The Chinese University of Hong Kong | Amyloid burden in post-stroke dementia |
| Prof Cindy Lam Lo-kuen<br>The University of Hong Kong | A study on health-related quality of life of patients with colorectal neoplasm and cost-effectiveness analysis of colorectal cancer screening in Hong Kong |
| Prof Anna Lee<br>The Chinese University of Hong Kong | Anaesthesia-related complications in adult passive smokers |
| Prof Vincent Wong Wai-sun<br>The Chinese University of Hong Kong | Liver fibrosis progression in patients with chronic hepatitis B: a prospective study with paired transient elastography examination |
| Dr Wendy Lam Wing-tak<br>The University of Hong Kong | A longitudinal study of psychosocial needs, physical symptom distress, and psychological distress of Chinese patients with colorectal cancer |

### Excellent Health Promotion Project Award

| Principal applicant | Project title |
|---|---|
| Prof Joseph Lau Tak-fai<br>The Chinese University of Hong Kong | 'Love others like ourselves – pass life to others' - A social marketing programme to promote organ donation among Protestant and Roman Catholic church-goers and their significant others |
| Dr Samuel Chu Kai-wah<br>The University of Hong Kong | Developing an interactive social game playable on iPhones, iPads and Facebook for promoting sexuality education among youngsters |

### Best Poster Awards

| Principal applicant | Project title |
|---|---|
| Prof Yeoh Eng-kiong<br>The Chinese University of Hong Kong | Measuring avoidable hospital readmissions in Hong Kong using the ambulatory care sensitive conditions |
| Dr Cheung Siu-tim<br>The Chinese University of Hong Kong | Drug transporter expressions associate with drug resistance and prognosis in liver cancer patients |
| Dr Samuel Chu<br>The University of Hong Kong | Developing an interactive social game playable on iPhones, iPads and Facebook for promoting sexuality education among youngsters |
| Prof John Nicholls<br>The University of Hong Kong | Molecular determinants of H9N2 virus haemagglutinin and neuraminidase affecting virus tropism for the human and swine respiratory tract |

Prof Sophia Chan Siu-chee, Under Secretary for Food and Health, thanked the keynote speakers, moderators, judges, the speakers in the parallel sessions, and all those who had prepared posters about their work. She also thanked the delegates for attending and looked forward to meeting them again at the next Health Research Symposium.

## References

1. Research Fund Secretariat. About Health and Medical Research Fund [Video file]. YouTube. Available from https://www.youtube.com/watch?v=Qe-VVJbg5Yo. Accessed 11 July 2017.
2. World Health Organization. Dr Douglas William Bettcher delivers keynote lecture at the Health Research Symposium 2017 [Video file]. YouTube. Available from https://www.youtube.com/watch?v=KlbPbW2ujGk. Accessed 11 July 2017.