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Health Research Symposium 2014: Translating Health Research into Policy for Health of the Population

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The Health Research Symposium 2014 was held on 15 November 2014 at the Hong Kong Academy of Medicine Jockey Club Building. The symposium was organised by the Food and Health Bureau (FHB) and aimed to (1) disseminate significant findings of research projects supported by the funds to the local research community; (2) facilitate the exchange of ideas between invited overseas experts and local researchers; and (3) acknowledge outstanding local researchers.

The FHB supports health-related research via the *Health and Medical Research Fund* (HMRF), which was created in late 2011 by consolidating its two former research funds (*Health and Health Services Research Fund* [HHSRF] and *Research Fund for the Control of Infectious Diseases* [RFCID]), by expanding the scope of the new fund to include advanced medical research, and by injecting HK\$1 billion. The number of research projects supported by the HMRF has grown from slightly more than 100 in 2011-12 to almost 250 in 2012-13. The total funding commitments have increased from HK\$90 million to \$211 million over the same period.

The HMRF aims to build research capacity and to encourage, facilitate, and support health and medical research to inform health policies, improve population health, strengthen the health system, enhance healthcare practices, advance the standard and quality of care, and promote clinical excellence, through the generation and application of evidence-based scientific knowledge in health and medicine. The principal research areas supported by HMRF are health and health services (the scope of the former HHSRF), infectious diseases (the scope of the former RFCID) and advanced medical research. The HMRF supports commissioned as well as investigator-initiated research. Commissioned research fills knowledge gaps and addresses public health needs and threats identified by the FHB.

In the past 2 years, the HMRF has attracted a large number of research proposals from local universities and medical experts on a wide range of topics, including communicable diseases (such as influenza, viral hepatitis, and HIV), non-communicable diseases (such as diabetes, hypertension, and stroke), diseases of ageing (such as

Alzheimer's and Parkinson's disease), mental health, Chinese medicine, and advanced medical research (such as stem cell and regenerative medicine). The Fund has also made substantial investments in research infrastructure, such as the commissioning of Phase 1 Clinical Trials Centres at the two local medical schools, as well as commissioned research studies to facilitate policy decisions on control of infectious diseases, healthcare for the ageing, cancer screening programmes, and manpower supply and professional development for our medical and healthcare professions.

Four parallel sessions were held: (1) population health and policy, (2) emerging/infectious diseases, (3) delivery of health services, and (4) advanced medical research.

The Symposium commenced with a welcome speech from Dr Ko Wing-man, the Secretary for Food and Health. He welcomed the more than 300 delegates who attended and presented souvenirs to the keynote speakers. The morning keynote session was moderated by Dr Constance Chan Hon-ye, Director of Health. The first keynote presentation was by Prof Sir Richard Peto (University of Oxford, UK). His presentation was titled "*Population Health: Halving Premature Death*". Prof Peto noted that worldwide, over the past 35 years, the probability of death before age 70 years has decreased from about one-half at 1980 death rates to one-third at current death rates. By 2050, the probability of death before age 70 years may decrease to only about one sixth, if we continue to pay attention to the remaining major preventable causes of premature death. These include communicable diseases (which predominate before middle age), non-communicable diseases (which predominate in middle age), and neonatal, maternal, and external causes of death. Since 1990, there have been only 5 major causes of death that have increased substantially in some large populations: tobacco (eg China), obesity/inactivity (eg Mexico), alcohol (eg Russia), HIV (eg South Africa), and war (eg Congo). Prof Peto discussed the prospects for effective action with particular emphasis on the UK and China.

The second keynote speaker was Prof Gabriel Leung (University of Hong Kong). His presentation was titled "*Does Hong Kong Still Aspire to Lead in*

Medical and Health Research? Prof Leung compared the research environment in Hong Kong with that in other developed economies around the world. Sizeable investment in health and medical research and the implementation of new technologies mean that the discovery and translational enterprises in the life sciences are rapidly developing and becoming ever intertwined. Prof Leung proposed that a cross-sector, Hong Kong-wide, easily accessible information platform is a prerequisite to our discovery and translational enterprise. Human capital, financial resources, and space remain the 'holy grail' input trinity. Dr Chan moderated the question-and-answer session after the presentations.

After the morning keynote session, the delegates attended the morning parallel sessions 1 and 2.

Parallel Session 1: Population Health and Policy

Prof Lam Tai-hing

A Proactive Family Smoking Cessation Intervention for Parents of Children 0-18 Months: A Randomised Controlled Trial

Prof Lam noted that the evidence from various interventions to help fathers of a newborn quit smoking and reduce household second hand smoke exposure is conflicting. The present trial examined the effectiveness of an intensive family intervention to help fathers quit smoking at home. This intervention provided by nurse counsellors was effective on fathers, although it had an insignificant effect on mothers to maintain a smoke-free home policy. Promoting quitting and a smoke-free home is important to reduce secondhand smoke exposure among infants and young children. More effective family interventions and more stringent tobacco control measures are also needed.

Dr Daniel Ho Sai-yin

A School-based Survey on Adolescent Alcohol Drinking in Hong Kong

Dr Ho observed that the effective control of underage drinking requires a thorough understanding of its risk factors and effects, but that little is known about the drinking pattern of Hong Kong adolescents. A territory-wide survey of drinking behaviour found that the prevalence of current and binge drinking was 21.5% and 7.5% respectively in Hong Kong Secondary 1-6 students. Socioeconomic, environmental and personal risk factors for current drinking were identified. Parental alcohol-related attitudes and pro-drinking practices, and adolescent expectations of alcohol drinking were modifiable risk factors that could be targeted by alcohol prevention programmes. Adolescent drinking was associated with depressive symptoms, poor academic performance, and sleep

problems. Dr Ho concluded that prospective studies should be conducted to confirm the identified risk factors and potential effects.

Dr Irene Wong Oi-ling

Breast Cancer Incidence and Mortality in a Transitioning Chinese Population: Current and Future Trends

Dr Wong noted that projections of future trends in cancer incidence and mortality are important for public health planning. Moreover, as the most economically developed city in China, Hong Kong may provide a sentinel for a substantial proportion of the global population. Modelling recent breast cancer incidence and mortality trends, Dr Wong found that in the developed Chinese population, breast cancer mortality has remained relatively stable over the past decades despite a certain degree of increased projections in older women, while the incidence has slowly risen. These patterns are likely to continue in the short to medium term. Increased disease risk may call for more resources for better cancer care and service delivery.

Dr Chang Wing-chung

The Hong Kong Mental Morbidity Survey 2010

Mental disorders are highly prevalent conditions that constitute a substantial global disease burden. In particular, common mental disorders (CMDs) including anxiety and depressive disorders pose a significant challenge to primary health care. Dr Chang and colleagues conducted a territory-wide mental morbidity survey that found that depressive and anxiety disorders are highly prevalent conditions that affect the adult population. A significant relationship of CMDs with poorer functioning and physical health indicates that enhanced social and occupational support as well as optimisation of physical state may facilitate improved mental health. Prevalence estimates of psychotic disorders highlight substantial unmet treatment needs for people with psychosis who have not yet received any psychiatric care (estimated as 1.5% of the population with psychosis). The survey provided valuable data to guide future development of mental health services in Hong Kong.

Parallel Session 2: Emerging / Infectious Diseases

Dr Ho Pak-leung

Epidemiology and Clonality of Multidrug-resistant *Acinetobacter baumannii* from a Healthcare Region in Hong Kong

Dr Ho observed that multidrug-resistant *Acinetobacter baumannii* (MDR-AB) is a rapidly

emerging nosocomial pathogen. About 10–30% of all *A baumannii* isolates in large hospitals are now resistant to three or more antibiotic classes with clinical utility. Dr Ho assessed the epidemiology of MDR-AB isolated from selected hospitals in Hong Kong and conducted genomic and molecular studies to define the risk factors for their isolation. Clonal expansion is playing a major role in the increase in MDR-AB in these hospitals in Hong Kong. The findings highlight the need to enhance infection control measures.

Dr Joseph Wu Tsz-kei

Estimating the Case Fatality Risk of Human Infections with Avian Influenza A (H7N9)

Characterisation of the severity profile of human infection with influenza viruses of animal origin is a part of pandemic risk assessment, and an important part of the assessment of disease epidemiology. Dr Wu and colleagues assessed the clinical severity of human infection with avian influenza A (H7N9) virus that emerged in China in early 2013. Human infections with avian influenza A (H7N9) virus seem to be less serious than has been previously reported. Many mild cases may already have occurred. Continued vigilance and sustained intensive control efforts are needed to minimise the risk of human infection.

Prof JSM Peiris

Protective Efficacy of Poultry Vaccines against Recently Circulating Highly Pathogenic Avian Influenza (HPAI) H5N1 Virus Isolates from Markets and Farms in Hong Kong 2008

Highly pathogenic avian influenza (HPAI) H5N1 remains a major threat to animal and public health. Since 2003, Hong Kong has successfully used poultry vaccination as part of its strategy to minimise this threat within Hong Kong. In mid-2008, an HPAI H5N1 outbreak occurred in a vaccinated poultry farm in Hong Kong. Prof Peiris compared the protective efficacy of different poultry vaccines against the 2008 farm outbreak strain, and assessed whether there is a need to alter the poultry vaccine used in Hong Kong. The results indicated that some clade 2.3.4 HPAI H5N1 viruses have undergone antigenic changes that allow them to evade immunity from poultry vaccines. The vaccine then in use in Hong Kong did not provide adequate protection against some circulating H5N1 virus strains and was subsequently updated to provide enhanced protection. The findings highlight the need for ongoing surveillance and monitoring of vaccine-induced immunity against currently circulating virus strains by serological tests, supplemented where necessary with experimental vaccine challenge studies in chicken.

Prof Margaret Ip

Modulatory Effects of Antimicrobials on the Pathogenicity of Community-Acquired Methicillin-Resistant Staphylococcus Aureus (CA-MRSA) in Hong Kong

Expression of virulence determinants, eg Panton-Valentine leukocidin, phenol-soluble modulins and alpha-haemolysin, plays an important role in CA-MRSA infections and can be triggered by cell-wall targeting antibiotics to alter infection outcome. Prof Ip determined the in-vitro effects of selected antibiotics on the expression of bacterial virulence factors and investigated the in-vivo effects of these antibiotics on the treatment outcome of CA-MRSA infection in a mouse model. Expression of virulence factors was modulated by sub-inhibitory concentrations of antibiotic. Selection of antibiotics that modulate or minimise the release of toxins is a promising approach to improve treatment outcome. The findings will shed further light on the choice of antimicrobials in the treatment of CA-MRSA infections.

Prof David Hui Shu-cheong

An Infection Control Study for Prevention of Exhaled Air Dispersion during Active Resuscitation and Application of Aerosol-generating Procedures

Tracheal intubation, non-invasive ventilation (NIV), tracheotomy and manual ventilation before intubation are aerosol-generating procedures that increase the risk of nosocomial transmission of SARS to healthcare workers. Prof Hui investigated the exhaled air dispersion during NIV via helmets or a total face mask and the effects of coughing on endotracheal suction and intubation using a human-patient simulator. A helmet with a good seal around the neck may prevent nosocomial infection during NIV. Constant endotracheal suction can reduce exhaled air leakage when a patient coughs with an endotracheal tube in place.

After lunch, delegates reconvened to hear the third keynote presentation. The session was moderated by Prof Francis Chan Ka-leung (Dean, Faculty of Medicine, The Chinese University of Hong Kong). Dr Nancy Edwards (Canadian Institutes of Health Research, Canada) gave a presentation titled *“Promoting Excellence in Health Research: Setting and Mobilizing a Research Agenda that Aims to Influence Policy and Improve Population Health”*. Dr Edwards described considerations in setting a research agenda and harnessing research findings for the public good, from the perspective of a research funding council. Approaches for assessing research capacity, describing the shifting state of science and related caveats, and identifying emerging priorities were highlighted. Dr Edwards

also described strategies to engage researchers in mobilising knowledge for evidence-informed policy and population health improvements. Illustrative examples from the Canadian Institutes of Health Research were used throughout the presentation.

After the keynote presentation, delegates attended the afternoon parallel sessions 3 and 4.

Parallel Session 3: Delivery of Health Services

Dr Colman Fung Siu-cheng

In-depth Cost-effectiveness Study of the Multidisciplinary Risk Factor Assessment and Management Programme (RAMP) 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 aimed to evaluate the cost-effectiveness of RAMP-DM compared with routine care in the primary care setting. Patients under RAMP-DM had lower risks of having various diabetes-related complications and all-cause deaths over the three-year period. RAMP-DM was also a cost-effective strategy to manage diabetic patients in both the short and long term.

Prof Martin Wong Chi-sang

Evaluation of the Introduction of the Reference Framework for Diabetes among Primary Care Physicians in Primary Care Settings

Prof Wong presented details of a study that evaluated the adoption of a diabetes mellitus (DM) reference framework in Hong Kong and explored the factors associated with its adoption. This study used a mixed-methods design with both qualitative and quantitative research methods. Focus groups reflected that the reference framework included practical and sufficient recommendations that were supported by adequate and high quality evidence. Overall, Prof Wong found that the DM reference framework is practical with sufficient recommendations. Several enhancing and hindering factors were identified. Efforts should be made to enhance eye examination and provide resources for better adoption among primary care physicians.

Dr Chin Weng-ye

Evaluation of Quality of Care of Chronic Disease Management Programmes and Public-private Partnership Programmes of the Hospital Authority

To improve the quality of care of patients with chronic diseases in primary care, the Hong Kong Hospital Authority introduced a series of chronic

disease management and public-private partnership programmes: Risk Factor Assessment and Management Programme and Patient Empowerment Programme for patients with diabetes mellitus and hypertension, Nurse and Allied Health Clinics programme, and Haemodialysis – Public Private Partnership Programme. Dr Chin and colleagues aimed to evaluate and enhance the quality of care of these programmes to assure that best practices and outcomes can be achieved. Dr Chin found that all programmes had been successfully implemented, with the standards of most structure and process of care criteria reaching target standards in the first two evaluation cycles. Significant improvements in clinical outcomes have been achieved. The study results provide evidence for the quality of care and effectiveness of the programmes in enhancing the health of patients with chronic diseases in primary care. Empirical standards of good practice have been established that can be used as quality benchmarks. Dr Chin concluded that ongoing evaluations should be conducted to assure the long-term sustainability and effectiveness of these programmes and to inform health policy and resource allocation.

Dr Marie Tarrant

Changes in Hospital Practices and Breastfeeding Outcomes after the Cessation of Complimentary Infant Formula in Public Hospitals

Infant formula supplementation in breastfeeding babies is one of the main contributors to early weaning. The provision of free infant formula to health-care institutions by formula manufacturers is a marketing strategy used by manufacturers to promote infant formula to new mothers. To promote and improve breastfeeding rates, the World Health Organization has recommended that health-care institutions refuse free infant formula products and pay the market price. In April 2010, all public hospitals in Hong Kong stopped accepting free infant formula from manufacturers. Dr Tarrant investigated the effect of public hospitals in Hong Kong not accepting free infant formula from manufacturers on in-hospital formula supplementation rates, baby-friendly hospital practices and breastfeeding duration and exclusivity. She found that stopping the acceptance of free infant formula in maternity-care settings reduces unnecessary supplementation and thus should be implemented in all health-care settings that provide obstetric and newborn care. Continued efforts by public hospitals to become more baby-friendly will benefit Hong Kong mothers and babies by enabling them to breastfeed for longer.

Parallel Session 4: Advanced Medical Research

Prof Leung Ting-fan

Spirometric Reference Standards in Chinese Preschool Children: Methodology, Challenges and Outcome

Advances in spirometry measurement techniques have made it possible to obtain measurements in preschool children. Validated reference standards are available for young Caucasian children but data in Chinese children are limited. Prof Leung led this study to establish spirometric reference standards for Chinese children aged 2-7 years. Data were collected from nearly 900 local children allowing spirometry normograms and reference equations to be calculated. Forced expiratory volume of these preschoolers is determined by gender, age, weight and standing height. The study results support the need for ethnic-specific spirometric references.

Mr Ellis Law Yuk-hung

Investigation of the Effectiveness of Two Different Therapeutic Exercise Programmes in Patients with Chronic Mechanical Neck Pain: A Randomised Controlled Trial

Mr Law and colleagues identified a need to conduct a randomised control trial to review the effectiveness of two different neck exercise programmes (McKenzie exercises and Upper Quarter Stabilisation exercises) that are commonly used in clinical settings. After a 5-week trial and 6-month follow up, the study results demonstrated that both types of exercise were effective in improving cervical active range of motion and numerical global rating of change scale up to 6 months interval.

Prof Kwan Hoi-shan

First-stage Development of a Comprehensive Genome Sequence Database for the Identification of Foodborne Pathogens in Hong Kong

Foodborne diseases such as salmonellosis and vibriosis are common public health issues around the world. In Hong Kong, *Salmonella enterica* serovars Enteritidis and Typhimurium accounted for almost 50% of salmonellosis whereas *Vibrio parahaemolyticus* commonly causes vibriosis. Prof Kwan and colleagues aimed to construct the first genome sequence database for local foodborne pathogens including *S Typhimurium* and *V parahaemolyticus* and to investigate the genotypes and phylogenetic relationships of the local isolates and compare them with strains worldwide. The investigators sequenced 10 clinical isolates of *S Typhimurium* and *V parahaemolyticus* and developed the genome sequence databases that provided a user-friendly platform to access and analyse their genome sequences and annotations. The platform facilitates the monitoring of trends of foodborne outbreaks and serves as a model for the use of genome sequences in clinical investigations.

Prof Simon Ng Siu-man

Electroacupuncture Analgesia for Colonoscopy: A Prospective, Randomised, Sham-controlled Study

Colonoscopy is often regarded as a painful and unpleasant procedure. Electroacupuncture (EA) has been used successfully to treat pain of various origins, but few good-quality studies have evaluated its role in treating pain and anxiety during colonoscopy. Prof Ng conducted a prospective randomised study to investigate the efficacy of EA in reducing procedure-related pain and the consumption of sedatives / analgesics during colonoscopy. His study suggests that EA is more effective than sham acupuncture in reducing procedure-related pain and the consumption of sedatives / analgesics during colonoscopy. The use of EA is an independent predictor of less consumption of patient-controlled sedatives/analgesics during colonoscopy.

After the afternoon parallel sessions, the delegates reassembled for the final plenary session moderated by Dr SV Lo (Director, Strategy & Planning, Hospital Authority). The final keynote speaker of the day was Prof Eng-kiang Yeoh (The Chinese University of Hong Kong), whose presentation was titled "*Delivery of Health Services: Systems for Health: The Emerging Sciences*". Prof Yeoh noted that the two critical challenges in improving the health of populations are the ability to understand: (1) the multiple and complex factors of the determinants of health, and (2) the nature of health systems as complex adaptive systems. Interventions to improve population health are implemented in complex human ecosystems that are dynamic and adaptive and influenced by individuals, the communities in which they reside, social processes and the wider social, political and economic environment. Prof Yeoh described scenarios in which systems thinking enables us to better understand the inter-relationships and inter-actions of the different components of health systems. Prof Yeoh emphasised that system science has been increasingly applied in health systems research using mixed methodologies from different academic disciplines, fostering the development of new sciences.

Award ceremony

After a question-and-answer session moderated by Dr Lo, 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

Prof Henry CHAN Lik-yuen

Department of Medicine and Therapeutics, The Chinese University of Hong Kong

Awarded Project: Use of serum hepatitis B surface antigen quantitation to monitor treatment response in chronic hepatitis B (08070242)

Project Team: Henry LY Chan, Vincent WS Wong

Dr CHEN Honglin

Department of Microbiology, The University of Hong Kong

Awarded Project: Antiviral drug resistance in H5N1 virus (06060582)

Project Team: H Chen, Y Guan

Prof GUAN Yi

School of Public Health, The University of Hong Kong

Awarded Project: Genomic characterisation, population ecology and genetics of H9N2 influenza viruses in southern China (06060722)

Project Team: Y Guan, Gavin JD Smith

Prof Anthony Johnson HEDLEY

School of Public Health, The University of Hong Kong

Awarded Project: Risks from passive smoking by workers in the catering industry (05060661)

Project Team: AJ Hedley, SM McGhee, R Fielding, JL Repace, CM Wong, Sandy Q Lu, Ada LY Ho, HK Lai, LC Wong, J Chen

The Most Promising Young Researcher Awards

Prof Alfred CHENG Sze-lok

School of Biomedical Sciences, The Chinese University of Hong Kong

Awarded Project: Elucidating gene regulatory networks of HBx isolated from novel HBV subgenotype / mutants associated with increased risk of hepatocellular carcinoma (08070332)

Project Team: Alfred SL Cheng, Henry LY Chan, Joseph JY Sung

Dr Suki LEE Man-yan

School of Public Health, The University of Hong Kong

Awarded Project: Role of cyclooxygenase-2 (COX-2)

in influenza A (subtype H5N1) viral pathogenesis and the potential use of its inhibitors for the therapy of H5N1 disease (06060562)

Project Team: Suki MY Lee, CY Cheung, JSM Peiris

Best Poster Awards

Prof David HUI Shu-cheong

The Jockey Club School of Public Health and Primary Care, Prince of Wales Hospital

Poster title: Aerosol dispersion during common respiratory therapies: a risk assessment model of nosocomial infection to healthcare workers (06060202)

Prof Cindy LAM Lo-kuen

Department of Family Medicine and Primary Care, The University of Hong Kong

Poster title: A study on health-related quality of life of patients with colorectal neoplasm and cost-effectiveness analysis of colorectal cancer screening in Hong Kong (08090851)

Dr Sherry CHAN Kit-wa

Department of Psychiatry, The University of Hong Kong

Poster title: 10-year outcome study of an early intervention program for psychosis compared with standard care service in Hong Kong (SMH-28)

Closing remarks

Prof Sophia Chan Siu-chee, Under-Secretary for Food and Health, made some closing remarks. She reflected on the excellent keynote presentations and how we must all strive to translate positive research findings into improvements in public health. She thanked all the delegates for attending and looked forward to meeting them again at the next Health Research Symposium.

The Food and Health Bureau remains committed to supporting high quality local research to provide evidence-based information for health policy formulation and to enhance public health through continuous improvement in health care practices.