

# SPHERiC NEWSLETTER

Singapore Population Health Improvement Centre

Jan 2018



## Director's Message

### Dr Sue-Anne Toh

Centre Director, Singapore Population Health Improvement Centre (SPHERiC)

Director, RHS Planning Office, NUHS;  
Senior Consultant, Endocrinology, NUH;  
Associate Professor, NUS

#### DEAR COLLEAGUES

Welcome to the first issue of the bi-annual SPHERiC newsletter.

The Singapore Population Health Improvement Centre (SPHERiC) was established in August 2017 under NUHS with the vision to be a leading centre for population health research, working towards a future in which every Singaporean enjoys good health and access to affordable, quality healthcare.

While research in medicine and public health has served our healthcare needs well thus far, there is an urgent need to develop population health research, to enable integrated research that encompasses social, economic, biological and medical sciences to better address the complex challenges our society faces.

To address Singapore's population health challenges and to align with MOH's direction of going beyond Healthcare 2020, three research priorities have been identified - (1) To intercept emerging threats to population health, (2) Achieve better care for individuals, achieve better health for population health and better value for all, and (3) Empower and activate communities to take charge of their health and well-being.

The newsletter will share developments and positive outcomes from rigorous multi-disciplinary research through the establishment of partnerships in the people, public and private sectors. We will also feature the Centre's contribution towards developing local expertise and capacity through training and setting up of appropriate



SPHERiC forms a centralised platform to promote multi-disciplinary research, innovative solutions, and catalysing shifts towards enhancements in our healthcare system.



With a strong base in public health and health services research, and by building on the efforts by the NUS Saw Swee Hock School of Public Health (SSHSPH) and Centre for Health Service and Policy Research (CHSPR), SPHERiC is focused on developing solutions that can be implemented at the population and health systems levels.

structures to develop and house young population health researchers. One such example is the proof-of-concept pilots that will be funded by the SPHERiC seed funding programme.

We look forward to collaborating with you in addressing our population needs.

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# Our Governance & Organisation

## SPHERiC Steering Committee

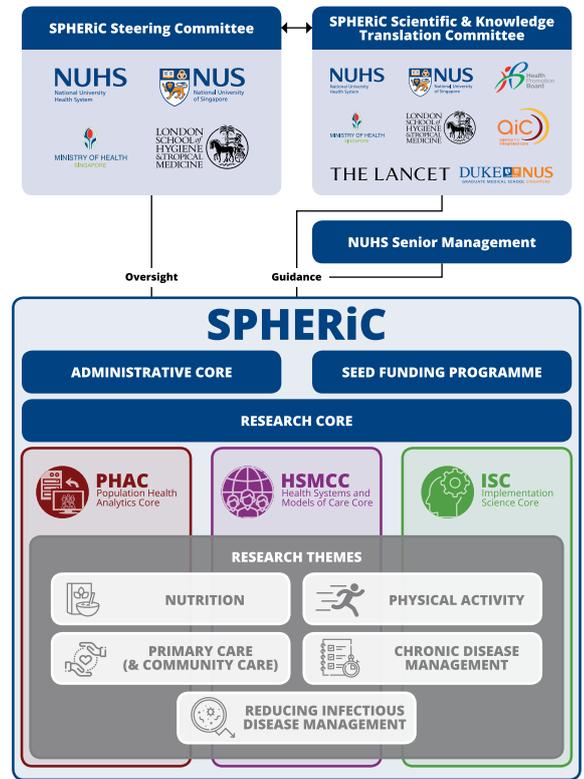
The SPHERiC Steering Committee will provide overall strategic guidance, facilitate local and international linkages and review the Centre's performance annually to facilitate the Centre's growth and development.

## Scientific & Knowledge Translation Committee

The Centre will also be guided by a Scientific and Knowledge Translation Committee which will provide scientific input, knowledge translation, facilitate partnership and support talent development.

## Research Themes & Research Cores

Five research themes were identified to address Singapore's population health challenges. These include: (i) nutrition, (ii) physical activity, (iii) primary care (and community care), (iv) chronic disease management, and (v) reducing infectious disease spread. Each research theme will be supported by three research cores - Population Health Analytics Core (PHAC), Health Systems and Models of Care Core (HSMCC) and Implementation Science Core (ISC). Each core will adopt a practical approach of building on existing research, understanding the problem in the local context, and ultimately culminate in actionable insight to address our population's needs.



SPHERiC Governance & Organisation Structure

# Population Health Analytics Core

TO FACILITATE COLLECTION AND ANALYTICS OF DATA ON HEALTH, SOCIAL AND BEHAVIOUR THROUGH DEVELOPING CAPABILITIES TO POLL A READY PANEL TO OBTAIN REPRESENTATIVE DATA, AND PERFORM AND VISUALISE POPULATION LEVEL ANALYTICS LAYERED WITH DETERMINANTS OF HEALTH.

## BMJ Global Health Publication: Severity and burden of hand, foot and mouth disease in Asia: A modelling study.

Hand, foot and mouth disease (HFMD) is a common paediatric disease infecting millions of children each year. It is particularly widespread in Asia. Because it occasionally leads to severe complications and death, Singapore has implemented strict control policies including routine surveillance in pre-schools, isolation of cases, and temporary school closure in response to outbreaks. Despite this, there is limited knowledge on the total burden of disease, which complicates decision making about which policies to retain.

In this project, the severity spectrum of HFMD was estimated using complementary data from several sources which were synthesized using mathematical models. Data were extracted from the literature using a systematic review of HFMD epidemiology. This approach provided a comprehensive picture of HFMD disease burden, including risk of infection, of symptomatic infection, complications and death, and the overall disability adjusted life-year (DALY) losses, along with associated uncertainties.



One of the most surprising findings in our previous research was the high amount of heterogeneity in key epidemiological parameters, such as how transmissible the viruses are, or what fraction of cases develop symptoms. This lack of consensus has meant that decision making is not as robust as it would ideally be. This new research fills in many of these gaps and for the first time provides an estimate of the overall burden of this important disease in Asia.

Associate Professor Alex Cook - SSHSPH, NUS



HFMD is estimated to cause 96,900 (95% CI 40,600–259,000) age weighted DALYs per annum in eight high burden countries in East and South East Asia, with the majority of DALYs attributed to Years of Life Lost. The majority of the disease burden could be avoided if the fatality rate could be reduced, possibly with the EV-A71 vaccine developed in

China. High asymptomatic rates have profound implications to the modelling studies previously conducted to estimate the reproduction number of EV-A71, which have been contradictory and may have led to overestimates of infectiousness.

With the majority of DALY caused by years of life lost from rare deaths, it is possible to mitigate most of the impact with increased EV-A71 vaccine coverage. Policies directed at HFMD should be re-evaluated based on this updated estimate of disease severity and burden.



Adult male with hand, foot and mouth disease.



**PHAC**  
Population Health Analytics Core

# Health Systems And Models Of Care Core

ENABLES BETTER UNDERSTANDING OF CURRENT CARE MODELS AND THEIR GAPS, HOW HEALTH SYSTEMS AFFECT ACCESS, DELIVERY AND EFFECTIVENESS OF CARE AND ITS IMPACT ON HEALTH, AS WELL AS FACILITATES THE TRANSLATION OF THIS UNDERSTANDING TO DESIGNING, IMPLEMENTING AND EVALUATING INNOVATIVE CARE MODELS, WITH A FOCUS ON CARE INTEGRATION AND COMMUNITY CARE.



NUS SSHSPH research associates (from left to right) Joel Koh and Victoria Haldane, PhD candidate Suan Ee Ong at the International Diabetes Federation's World Congress

## Sharing insights on the War on Diabetes in Singapore at the 2017 International Diabetes Federation's Congress

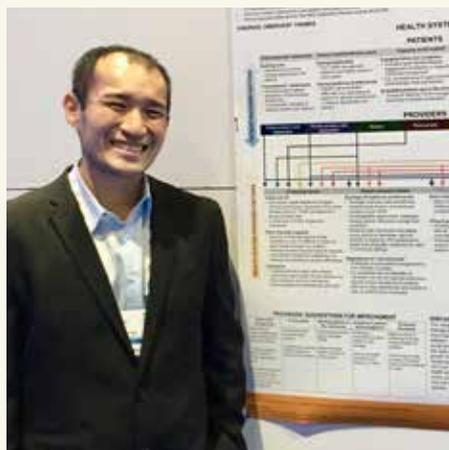
NUS Saw Swee Hock School of Public Health (SSHSPH) research associates Victoria Haldane and Joel Koh and PHD candidate Suan Ee Ong, attended the International Diabetes Federation (IDF) Congress in Abu Dhabi, UAE from 4 to 8 December 2017. The theme of the Congress was "Shape the Future of Diabetes and Foot-Related Challenges, and Diabetes and Disasters".

During the conference, outgoing IDF President Dr Shaukat Sadikot likened the global fight against diabetes to a war, echoing the sentiments of Singapore's own 'War on Diabetes'. Incoming IDF President Prof Na Han Cho reiterated the urgency of addressing the global diabetes challenge noting that diabetes claims more lives and costs more than war and

that the consequences of the worldwide "diabetes tsunami" affects us all.

At the Congress, the team presented three posters 'Exploring the perspectives and experiences of Type 2 Diabetic patients in Singapore', 'The insights and challenges of healthcare professionals who care for Type 2 Diabetic patients in Singapore' and 'Comparing Healthcare professionals perspectives on Type 2 Diabetes vs. Hypertension in the Singapore context'.

The team hopes that their learning from the Congress, especially those around cross-sectoral collaboration and the role of culture and society in shaping current and future diabetes challenges will contribute to their non-communicable disease projects under NUHS SPHERiC's Health Systems and Models of Care Core (HSMCC).



“ This Congress has been an excellent opportunity to meet and learn from other health systems practitioners around the world. The sharing about the different responses to the increasing global burden of diabetes has been enlightening and inspiring.

Joel Koh

“ Attending the Congress has been a great opportunity to engage with the larger dialogue on diabetes and comorbidities. I've enjoyed hearing about international experiences in preventing and managing Type 2 diabetes and other chronic conditions, as well as innovative ways to encourage adherence and lifestyle modifications.

Victoria Haldane

“ We are grateful to SPHERiC for supporting the endeavours of young researchers like ourselves, and for giving us the opportunity to learn from experts at the forefront of diabetes research and practice.

Suan Ee



# Implementation Science Core

PROVIDES A MULTI-DISCIPLINARY APPROACH TO TEST NEW APPROACHES TO IMPROVE HEALTH PROGRAMMING, INVESTIGATE AND ADDRESS MAJOR BARRIERS THAT IMPEDE EFFECTIVE IMPLEMENTATION. EVALUATIONS WILL ALSO EMPHASISE A MIXED-METHODS PERSPECTIVE, INTEGRATING QUALITATIVE RESEARCH TO PROVIDE INSIGHT AND DEPTH WHEREVER APPROPRIATE, ECONOMIC EVALUATION AND DECISION ANALYSIS.

## Community Health Screening Quality Improvement Project

In 2016, the researchers from NUHS Centre for Health Services and Policy Research embarked on a quality improvement project using qualitative research methodology to evaluate the barriers and what encourages residents to participate in NUHS's Community Health Screening programme. The team also did a rapid assessment on the feasibility and potential effectiveness

of introducing various strategies such as incentives aimed at increasing the uptake of screening and follow-up among residents.

Through the qualitative research findings, the team found strong awareness, demand for and appreciation of community-based health screening and chronic disease management.

However, these did not translate into participation in the screening programmes or follow-up due to mismatch between community demand and eligibility as well as the concern of long term cost involved in subsequent follow-ups, once an individual is diagnosed with one or more chronic diseases.

In addition, while financial incentives to incentivise appropriate behavior are easy to implement, findings revealed that they do not address fundamental barriers, including the aftermath cost for disease management. Findings suggested social incentives to be more effective but the implementation of such incentives could be more complex.

To assess the impact and performance of the community health screening in general, the team found a lack of baseline data for appropriate population-level needs assessment. Moving forward, the team would like to work with various stakeholders to better assess and estimate the baseline target population and come up with more appropriate strategies in improving management of chronic diseases in newly diagnosed individuals.



*In-depth interviews with residents*



*Patient exercising using the Tele-Rehabilitation programme*

## Smart Health Telerehab

Nationally piloted in 2017, Smart Health TeleRehab is a common platform to evaluate clinical effectiveness, patient receptiveness, productivity gains and cost efficiency for patients with conditions such as stroke, fractures, lower limb joint replacement, lower limb amputations, falls, musculoskeletal conditions and more. The NUHS tele-rehabilitation programme created from the collaboration between Integrated Health Information Systems (IHIS) and T-Rehab Pte Ltd has five different categories of exercise which combines both physiotherapy and occupational therapy. In the pilot, a standardised

rehabilitation programme was provided to patients in the intervention group. Progression of levels within each exercise within each category were determined by the tele-therapist and in consultation with the patient.

The programme benefits both the patient and caregiver by improving accessibility as the rehab exercises are now conducted at home, reducing the time taken to travel to the rehab centres. The programme also improves productivity by acting as a 'workforce multiplier' for the therapist, resulting in more rehab sessions available for more patients.



#### STAGE 1

Therapist prescribes a tailored exercise choosing from 40 types of exercises, level of difficulty, angles, 'hold' position and number of repetitions

#### STAGE 2

Caregiver/Patient sets up the exercise consisting of wearable sensors and a tablet. Caregiver/Patient clicks on Smart Health Telerehab application and presses "play"

#### STAGE 3

Patient exercises with video demonstration and indicators for accurate completion of exercises

#### STAGE 4

Therapist reviews compliance and performance by retrieving the patient's progress chart



As a community healthcare provider, one of our main focuses is to help patients transit seamlessly from the hospital back to the community by providing continuous post-discharge home care. Smart Health TeleRehab facilitates this transition by empowering patients to take care of their rehabilitation process. The technology is also welcome by the seniors due to its easy-to-understand interface.

**Mr Shekhar Sinha,**  
Director, Allied Health, Ang Mo Kio  
Thye Hua Kwan Hospital



## Enhancing Capabilities In Population Health

### SPHERiC Seed Funding Programme



Launched in November 2017, the SPHERiC seed funding programme aims to contribute towards the development of population health research capabilities in Singapore. The grant is designed to translate evidence into action through the support of small exploratory studies that may contribute preliminary data to potentially vie for bigger grants on a national level.

Proposals will be assessed based on their relevance to the development of population health analytics, health systems and policy research, and implementation sciences core as well as their alignment with the Centre's vision and mission. Successful awardees will be strongly encouraged to disseminate the findings of their research projects through publications, in professional journals and presentations. The first round of grant results is set to be announced in April 2018.

### Learning from International Experts



Prof David McCoy  
(seated, third from left) sharing his experiences with the SPHERiC team

Professor David McCoy, Professor of Global Public Health at the Centre for Primary Care and Public Health in Queen Mary University London, was in Singapore from the 18th to 20th December 2017. During his visit, Prof McCoy met with NUHS Senior Management from SPHERiC, Alexandra Campus and community partners from Queenstown. He shared insights from the United Kingdom, and highlighted initiatives that have impacted integrated care such as the Castlefield Project, matrons in the community and Expert Patients Programme (EPP).

In his capacity as a scientific advisor to SPHERiC, Prof McCoy opined the centre look to defining population health research so that it could be used strategically to catalyse a new body of research aimed at addressing the population health challenges facing Singapore. He provided the following suggestions to consider in defining population health research: Incorporating a strong element of research and analysis with regards to the issues of equity. This may be designed around exposure to determinants of ill health, healthcare financing and utilisation, quality of care received and health outcomes. For social science research to be given a prominent role as the pattern of health outcomes at a population level is impacted by the various social determinants of health. He also suggested to include input from experts and stakeholders from outside the traditional health sector when prioritising and assessing research ideas and projects for funding. Lastly, he recommended for SPHERiC to consider developing a regional population health research agenda that could be focused on the ASEAN region.

FOR MORE INFORMATION PLEASE VISIT:



<http://nuhs-portal/departments/nuhs-corporate-office/rhs-for-the-western-region/spheric.html>

# Sharing Knowledge

SPHERIC RESEARCH CORE PRINCIPAL INVESTIGATORS SHARED THEIR KNOWLEDGE AND EXPERTISE WITH THE RESEARCH COMMUNITY AND THE PUBLIC THROUGH VARIOUS PLATFORMS.

Associate Professor Joanne Yoong on the judging panel for the Singapore Health and Biomedical Congress (SHBC) 2017 Best Poster Award - Health Services Research.



Based on her qualitative research, A/Prof Yoong helped participants understand the motivations and attitudes towards health screening and living healthier lifestyles, as part of the resource panel for the first health-related Citizens' Jury for the War on Diabetes.



Associate Professor Alex Cook speaking on Modelling Dengue in Singapore at the Climate Modelling and Its Relevance for Vector-borne Diseases Seminar hosted by NEA's Environmental Health Institute and Meteorological Service Singapore.



Associate Professor Helena Legido-Quigley speaking at the 2017 Kyoto Global Conference for rising public health researchers organised by the Kyoto University of Public Health.

## Training & Workshops



**THE 'R'**  
**Date:** 30 April 2018, Monday  
**Time:** 9am - 5pm

**Fees (w GST):**  
\$200 (NUS & NUHS Staff) &  
\$250 (External)

**Venue:** Saw Swee Hock School of Public Health, MD6, 12 Science Drive 2, Active Learning Room, #03-04, Singapore 117549

Associate Professor Alex Cook, Head of the Population Health Analytics Core, SPHERiC and Vice-Dean (Research), SSHSPH, NUS

The workshop will offer advanced knowledge in R programming language for data analysis and statistical applications including advanced commands and concepts in R to participants. It will provide an overview of multivariate regression, multivariate data analysis, and Bayesian statistics and modeling.

Registration is accepted on a first come, first serve basis and is subject to availability of seats. Participants are required to bring their own laptops and have a basic knowledge in Stats 101.

Closing date for registration is **30 March 2018**. For more information and to register, please e-mail your interest to [spheric@nuhs.edu.sg](mailto:spheric@nuhs.edu.sg).

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