

SPHERiC NEWSLETTER

Singapore Population Health Improvement Centre

Issue 08 - August 2021

Director's Message

DEAR COLLEAGUES

I hope you have been staying safe and well as we continue to fight against the COVID-19 pandemic, and transition to COVID resilience with cautious optimism.

A recurring theme of the COVID-19 pandemic is how it has exposed the limitations and vulnerabilities of many health systems, even those that were previously considered high performing. A/Prof Helena Legido-Quigley, PI of our Health Systems and Models of Care Core, and her team, have conducted a timely comparative analysis of national responses of 28 countries in managing the COVID-19 pandemic, using a new health system resilience framework. This analysis, published in *Nature Medicine* in May 2021, provides insights that will contribute to strengthening countries' response and preparedness to future public health emergencies. I would also like to take this opportunity to congratulate A/Prof Legido-Quigley on being appointed a member of the Secretariat for The Independent Panel for Pandemic Preparedness and Response (IPPPR), commissioned by the World Health Organisation to provide an evidence-based roadmap for building resilient health systems drawing on lessons from the COVID-19 pandemic. This appointment is a recognition of her longstanding contributions and global standing in the field of health systems and global health research.

Locally, the large COVID-19 outbreaks in foreign workers' dormitories have shone a spotlight on the care and protection of our foreign worker communities. The Population Health Analytics Core team, led by A/Prof Alex Cook, was commissioned by Temasek Foundation to quantify the vulnerability of the foreign worker dormitory community to outbreak recurrence by analysing their contacts in the dormitories. We hope that these insights will be useful for policymakers and stakeholders involved in the care of foreign workers as well as the design and management of foreign worker accommodation.

Undeniably, the pandemic has had a profound social and psychological impact on front-line healthcare professionals. A/Prof Tan Ker Kan and the Implementation Science Core team have embarked on a collaborative study to understand the protective psychological factors that have helped our front-line healthcare professionals cope during the COVID-19 pandemic. One important insight from the study - a supportive environment and network are crucial to help them navigate through crisis!

Even in the midst of the ongoing COVID-19 pandemic, we should not forget about the burden of chronic diseases on our society. Colorectal cancer continues to be the top cancer in Singapore, and early detection is key to saving lives. A/Prof Tan and his team have been studying the major barriers and facilitators of colorectal screening uptake in the Singaporean population, in collaboration with Health Promotion Board and Singapore Cancer Society. The findings will be helpful in co-designing future health promotion campaigns and interventions to promote colorectal screening awareness and uptake in age-eligible Singaporeans.

Despite all the challenges presented by the pandemic, I am very proud of the SPHERiC team's contributions and continued efforts in advancing population health research. We are particularly heartened by the good work, commitment and achievements of young investigators and rising stars - Dr Borame Dickens, Dr Rayner Tan, Mr Foo Chuan De, Dr Farah Shiraz, Dr Kuan Win Sen, Dr Andre Müller and others. I am delighted to share some of their work in this newsletter.

Stay safe, and I wish everyone good health.



Dr Sue-Anne Toh
Centre Director, SPHERiC

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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.

Objective Measurement of Contacts in Foreign Workers' Dormitories

Singapore's COVID-19 pandemic in 2020 was characterised by explosive outbreaks in foreign worker dormitories, infecting at least 60% of the population and leading to severe restrictions on the residents' movement for months. After the dormitories were "cleared" of infection in August 2020, workers underwent regular swabbing to clamp down on any budding outbreaks, and have had their freedom to interact with others and were even able to leave the dormitories curtailed. Researchers from the SPHERiC's PHAC were commissioned by Temasek Foundation to quantify their vulnerability to outbreak recrudescence.

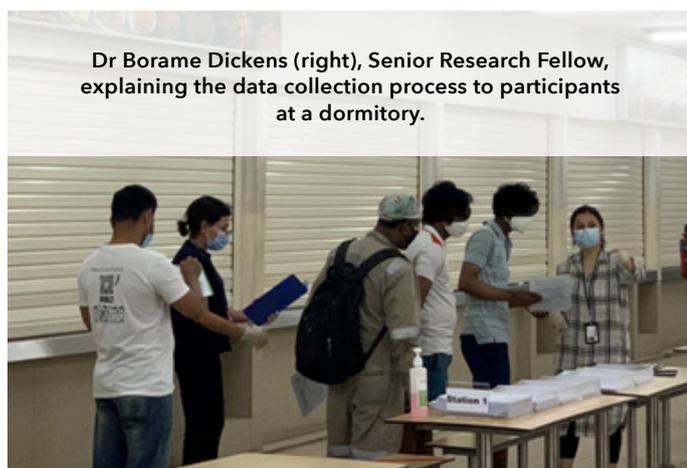
The study involved recruiting over 1000 men residing in two dormitories operated by Keppel Housing, and extracting data from a radio-frequency identification (RFID) device called BluePass, which is functionally similar to the TraceTogether token carried by many members of the general community. After providing consent, participants completed a short questionnaire and their BluePass tokens were scanned by the research team, to extract their (anonymous) contacts to a server. The contact data were then processed to answer several questions about the nature, timing and degree of contacts among this group.

The team found that there were notable differences in the number of contacts residents of the two dormitories

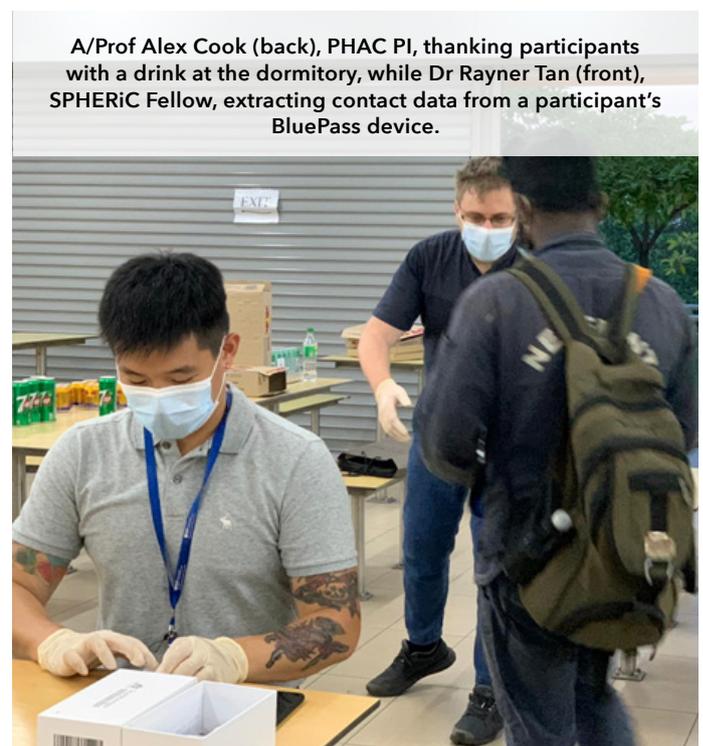
had, with one that was structured more like an apartment block having about half as many contacts, especially in the evening and at night, as one structured like a typical dormitory. There were periods in the day, around 6am and 6pm—corresponding to shift change, and around noon, when the number of casual contacts spiked. Most infection events are expected to occur to men not living within the same unit as each other, and in particular there were substantial amounts of within-block contact. We also found a small but notable amount of cross-dormitory contact, despite the efforts of the operators to restructure working arrangements to prevent this. We did not find evidence that there was any relaxation of compliance by the foreign workers over the course of 2021.



DATA COLLECTION AT A DORMITORY



Dr Borame Dickens (right), Senior Research Fellow, explaining the data collection process to participants at a dormitory.



A/Prof Alex Cook (back), PHAC PI, thanking participants with a drink at the dormitory, while Dr Rayner Tan (front), SPHERiC Fellow, extracting contact data from a participant's BluePass device.



This study has collected millions of recorded contacts from which we can derive important insights on the timing and nature of contacts in this group of men who are particularly vulnerable to infection. The insights from the study should help us design dormitories that help protect our foreign worker population from outbreaks like COVID-19.

**Associate Professor Alex Cook - SSHSPH,
National University of Singapore**



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.

Health Systems Resilience in Managing the COVID-19 Pandemic: Lessons from 28 Countries

First Author:
Mr Foo Chuan De

No one would have expected a pandemic of such an unparalleled magnitude to manifest during our lifetime, creating the need for cutting edge research that focuses on health systems resilience. Under the auspices of The Independent Panel for Pandemic Preparedness and Response (IPPPR) commissioned by the World Health Organisation (WHO), a group of public health experts both locally and internationally came together to provide an evidence-based roadmap for the construction of resilient health systems grounded in lessons drawn from the present pandemic. In May 2021, the team comprising researchers from SPHERiC published a paper in Nature Medicine that offered a comparative analysis of national responses of 28 countries. The paper focused on domains that capture governance and finance, health workforce, medical products and technologies, public health functions, health service delivery and community engagement which allowed the synthesis of elements underpinning an effective national response.

For more information: <https://doi.org/10.1038/s41591-021-01381-y>

As a Research Associate at Saw Swee Hock School of Public Health (SSHSPH) at the National University of Singapore, Mr Foo Chuan De, one of the first authors of the Nature Medicine paper expressed his thoughts on the publication, "Seeing the paper the team worked on get published in such a top tier medical journal feels truly ethereal. This would not have been possible without the leadership of my supervisor, A/Prof Helena Legido-Quigley and the combined efforts of my teammates. The findings explicated in this paper are now more relevant than ever as the world prepares to transition into a new normal. Health systems will need to be fortified, and the world readied to contain future versions of the virus".

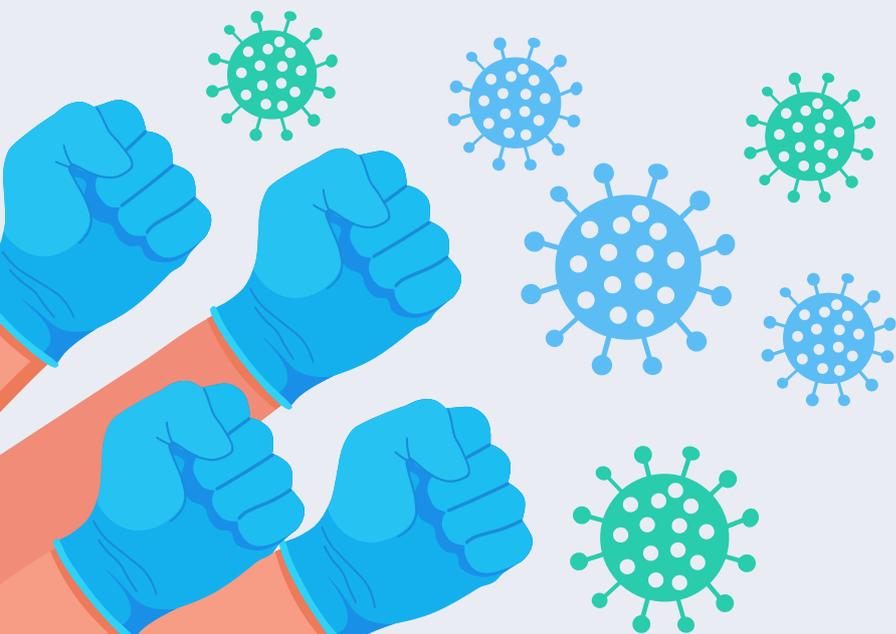
Looking back, health systems research did not come naturally to Chuan De. His journey began with a Minor in Public Health which ignited his interest in public health as an undergraduate. Coupled with his involvement in public health projects both locally and overseas, he came to realise that public health is a ballast for the health of a population. Importantly, the resilience of a country's health system is heavily influenced by the policies it promulgates. This shaped Chuan De's belief in the potential of research in transforming health policies, which has brought him to where he currently is - as a public health researcher investigating pandemic readiness, models of primary health care and service delivery integration. Chuan De credits the training he received at SSHSPH for the skills he uses to investigate health policies. One of the skill sets is the ability to don multiple lenses and evaluate policies at macro, meso and micro levels. This equips him to understand why policymakers implement policies, how health systems respond and whether the general public understands these policies.

Holding Singapore's healthcare transformation close to his heart, Chuan De aspires to serve the community by continuing to perform research at the forefront and share Singapore's best practices with the world. He reiterated, "Now is the opportune moment for health systems to be reformed. In the face of a global pandemic that is fast reaching its two-year mark, it is critical that we continue to share information, learn from each other and work together to make this pandemic the last pandemic".



An ounce of prevention is worth a pound of cure. This is public health.

Mr Foo Chuan De



Implementation Science Core

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

Promoting Colorectal Screening Awareness: The Need for High Risk Singaporeans to Complete Screening for Prompt Detection and Early Treatment

Colorectal cancer (CRC) remains the top cancer in Singapore, with 10,634 incident cases diagnosed between 2013 - 2017. While Health Promotion Board (HPB) and the Singapore Cancer Society (SCS) continue to advocate early detection via their national faecal immunochemical test (FIT) programme, it is estimated that only about a third of those with positive FIT results actually undergo the recommended follow-up colonoscopy.

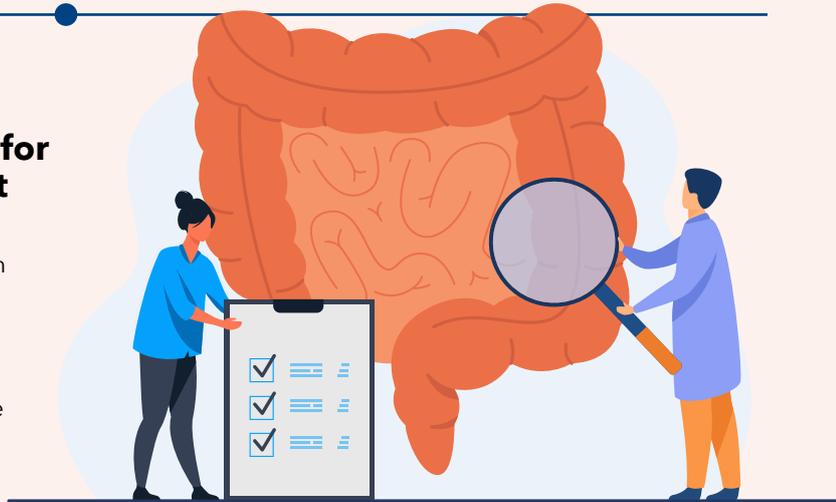
Representing NUHS to the media during the recent Colorectal Cancer Awareness Month in March, A/Prof Tan Ker Kan (Core PI, Implementation Science Core) shared the findings of two CRC studies conducted collaboratively between researchers from the SPHERiC's ISC and the NUS Yong Loo Lin School of Medicine.

The first study surveyed 394 patients aged between 46 and 89 years who had received at least one positive FIT result between 2017 - 2019, and were referred to NUH for follow-up colonoscopy. The median age was 66 years with a slight male majority (53.8%). To ensure a balanced representation of perspectives, the study ensured that half of the participants (50.8%) were randomly sampled from patients compliant to follow-up, while the rest of the sample were from non-compliant patients. While nearly all participants were aware of CRC screening's role in early detection and that an earlier diagnosis would improve survival (96.7% and 97.5% respectively), non-compliant individuals were expressed 1) preference for reminder calls about their need to complete the screening process, and 2) concerns about bowel preparation and the cost of colonoscopy. Moreover, the study found that compliant individuals were nearly twice as likely to have received a physician's recommendation to undergo screening, and were generally accompanied by family or friends when attending healthcare appointments.

The second study, which was recently published in PLOS One, retrospectively analysed colonoscopy outcomes from a cohort of 1,422 FIT-positive individuals referred to NUH from SCS from January 2017 - March 2020. Only 51.7% of these individuals eventually completed their follow-up colonoscopy. More alarmingly, the study found that individuals with two positive FIT results were nearly 12 times (incidence rate ratio of 11.4) more likely to be found with CRC upon colonoscopy, compared to individuals with only one positive FIT result. Double FIT-positive individuals were also significantly more likely to have a pre-malignant polyp (59.5% versus 41.6% respectively).

The SPHERiC's ISC continues to contribute towards greater CRC screening awareness in Singapore through active sharing with key collaborators in Ministry of Health (MOH), HPB, and SCS, and with the larger international community via academic publication of these findings.

For more information: <https://doi.org/10.1371/journal.pone.0250460>



Our findings suggest that the family and social network around high-risk individuals play a huge role in persuading them to complete colonoscopic evaluation. It was also clear to us that physicians are regarded highly, and the advice of trained medical professionals may be integral in encouraging some of these non-compliant individuals to follow through with their screening.

**Associate Professor Tan Ker Kan –
Senior Consultant, Division of Colorectal Surgery,
National University Hospital**



1 to 2 persons out of every 10 with a double positive FIT result will have cancer, and that is a very high incidence. There is therefore a greater urgency to have double FIT-positive patients go for colonoscopy as soon as they can. The sooner they can start treatment, the better their chances of recovery and disease management. Towards this end, NUH and NCIS are looking to help expedite colonoscopy for our double FIT-positive patients to ensure prompt detection of CRC and polyps.

**Associate Professor Tan Ker Kan –
Senior Consultant, Division of Colorectal Surgery,
National University Hospital**



Implementation Science Core

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

Protective Psychological Factors During COVID-19: How Our Front-line Healthcare Professionals Cope During the Pandemic

Primary care physicians (PCPs) and emergency medical department (EMD) professionals continue to serve on the front-lines of Singapore's COVID-19 efforts. In this collaborative study with Dr Farah Shiraz (Visiting Senior Research Fellow, SSHSPH) and Dr Kuan Win Sen (Senior Consultant, EMD, NUH), researchers from the SPHERiC's ISC sought to understand the experiences of PCPs and EMD professionals during the first year of the pandemic.



The team interviewed a total of 39 healthcare professionals from the NUHS Primary Care Network, National University Polyclinics, NUH EMD, and the College of Family Physicians, Singapore. Participants were recruited using purposive sampling via email invitation, and represented a mix of physicians, nurses, and operations staff. Using an exploratory qualitative design and in-depth interviews, the team examined the psychological impact of COVID-19 on our PCPs and EMD professionals, as well as protective factors that helped them cope with the demands of serving during this pandemic.

Although stressors such as increased workload and frequent changes in workplace protocols were identified by the participants, most accepted these as an inevitable part of their duty. The major work-related stressor that participants felt - especially during the earlier stages of the pandemic - was the risk of unknowingly exposing their family members to COVID-19. To mitigate this, our participants often attempted to isolate themselves from their loved ones, which exacerbated the stress and isolation experienced.

Many of our EMD professionals expressed that working in emergency medicine meant they had signed up for a profession which necessitated dealing with uncertainties and making decisions in unknown situations. One notable pillar of support that most participants agreed upon was a sense of team spirit in the healthcare profession. Many participants had emphasised that they had built close rapport with their colleagues, and were able to maintain high morale in the team in spite of the difficult times. This contributed greatly to their psychological resilience over the past year. Other protective factors reported were a cumulation of pandemic preparedness both in the operational (e.g. emergency protocols in place for efficient adaptation to the situation at hand) and psychological (e.g. trainings to prepare healthcare professionals in case of a pandemic) sense.

To conclude, our study demonstrated the importance of cultivating a supportive work environment for healthcare professionals during peacetime, as these build the crucial resilience to help them navigate through uncertainties in times of crisis. Creating programmes to enhance team spirit, peer support, and coping skills would greatly aid our front-liners in keeping morale high even as the pandemic wears on.



Enhancing Capabilities In Population Health



Dr Andre Matthias Müller is a lecturer at the Saw Swee Hock School of Public Health, NUS, and was awarded the SPHERiC Fellowship in April 2019. He shares with us his research and achievements, and what he hopes to accomplish in the area of population health research in the future.

Focus on SPHERiC Fellow

“ Receiving the Fellowship has made me very happy because it allowed me to pursue research that I wanted to do, but never had an opportunity to. As an early-career Academic, this Fellowship has also allowed me to gain valuable experience with leading research in my field.

The Fellowship has helped me to publish four papers in peer-reviewed journals. In particular, I was able to spend a significant amount of time and effort on a systematic review in which we investigated the factors that drive sedentary behavior (too much sitting) in Asia. It turned out that being sedentary is often shaped by social and physical environments (e.g., public transport infrastructure). This work received the Best Conference Paper award from the Asia-Pacific Academic Consortium for Public Health, before being published in a very prestigious academic journal.

I aim to continue my research on health behaviors, and especially in physical activity and sedentary behavior; with a special focus on promoting healthy lifestyles in Singapore and Asia. Developing interventions that are effective and scalable will be one key focus. ”

Sharing Knowledge

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

The Independent Panel for Pandemic Preparedness and Response: Recommendations to Prevent Future Pandemics, May 2021

A/Prof Helena Legido-Quigley was appointed as a member of the Secretariat for The Independent Panel for Pandemic Preparedness and Response, which was established by the World Health Organisation Director-General, to conduct an independent evaluation of the lessons learnt from the international health response to the pandemic. In May 2021, the Panel, co-chaired by the Rt Hon. Helen Clark, former Prime Minister of New Zealand, and Her Excellency Ellen Johnson Sirleaf, former President of Liberia, made seven recommendations that highlighted the need to elevate pandemic preparedness and response to the highest level of political leadership, increase accountability, and strengthen global coordination mechanisms to make COVID-19 the last pandemic.

For more information: <https://theindependentpanel.org/>

The Straits Times, The Big Story: Living with an Endemic Disease; Expert on Parallels of Managing COVID-19 and Influenza, June 25, 2021

A/Prof Alex Cook was invited for a media interview by The Straits Times, to share his expert opinion on Singapore's new normal, which will require living with COVID-19 as an endemic disease. He also provided his thoughts on the parallels of managing COVID-19 and influenza, in terms of the efficacy of the vaccine, and the vaccination rate in Singapore.

For more information: <https://www.straitstimes.com/videos/the-big-story-living-with-an-endemic-disease-expert-on-parallels-of-managing-covid-19-and-influenza/6260964572001>

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