

# SPHERiC NEWSLETTER

Singapore Population Health Improvement Centre

Issue 07 - February 2021

## Director's Message

### DEAR COLLEAGUES

2020 was a momentous year, with the COVID-19 pandemic resulting in unprecedented challenges to healthcare systems worldwide, and devastating disruptions to society and the global economy. Many countries implemented restrictions on population movement in a bid to slow the spread of the disease, with varying degrees of success. These countries are now undertaking the complex and challenging task of transitioning out of these restrictions into a new post-pandemic normal, balancing a desire to prevent disease and safeguard health system capacity against social and economic considerations. Our Health Systems Core team, led by A/Prof Helena Legido-Quigley, has conducted a timely analysis comparing the strategies adopted by nine countries and regions in Asia Pacific and Europe on the easing of COVID-19 restrictions. The lessons learnt from their experience can provide a useful framework to guide countries on the implementation and easing of control measures, not only for COVID-19, but for other future public health emergencies.

While significant attention and resources have gone towards combatting COVID-19, we cannot neglect other ongoing health concerns. Dengue is endemic in Singapore, and dengue outbreaks, with their associated morbidity and mortality, are perennial concerns. In 2020, the number of dengue cases in Singapore reached a record high, with more than 30,000 people infected. Our Population Health Analytics Core team, led by A/Prof Alex Cook, collaborated with the National Environment Agency (NEA) to carry out a spatio-temporal analysis of the main dengue vector populations within Singapore. Interestingly, the study found that in the context of Singapore and its highly managed urban environment, geographic and social factors may have greater influence on mosquito breeding than climate - insights that could benefit the tailoring of vector control measures.

Aside from infectious disease, ageing remains a priority focus in Singapore. The MOH Office for Healthcare Transformation (MOHT) commissioned the Implementation Science Core to conduct a scoping review on ageing research in Singapore, to identify progress as well as gaps in the scientific evidence. The findings will provide a useful resource for policy makers and academia in shaping future research to support healthy ageing.

As we begin a new year, I would like to take this opportunity to wish you and your loved ones a happy, healthy, and fulfilling 2021!



**Dr Sue-Anne Toh**  
Centre Director,  
Singapore Population Health  
Improvement Centre (SPHERiC)

## IN THIS ISSUE

### 1. Director's Message

### 2. Population Health Analytics Core

- Spatio-Temporal Analysis of the Main Dengue Vector Populations in Singapore

### 3. Health Systems and Models of Care Core

- Lessons Learnt from Easing COVID-19 Restrictions: An Analysis of Countries and Regions in Asia Pacific and Europe

### 4. Implementation Science Core

- Scoping Review on Ageing Research in Singapore (2008- 2018): Characteristics, Trends and Gaps

### 5. Enhancing Capabilities in Population Health

- Focus on SPHERiC Fellow
- Sharing Knowledge

### 6. Contact Us

# 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.

## Spatio-Temporal Analysis of the Main Dengue Vector Populations in Singapore

Dengue is predominantly spread through two mosquito species. *Aedes aegypti*, which is anthropophilic, is found in higher densities around housing, and *Aedes albopictus*, is found more commonly in areas with plant cover, and bites other animal species as well as human. Vector control in Singapore focuses on *Ae. aegypti* and takes the form of source reduction and health education campaigns, while recent years have seen the pilot testing of biocontrol through the release of Wolbachia-infected male mosquitoes to suppress the wild-type population.

Despite the success of Singapore's vector control programme, dengue remains endemic, and mosquito breeding remains frustratingly elusive to wipe out. In the last few years, the National Environment Agency (NEA) has monitored breeding levels across public housing estates through Gravitraps that catch the gravid mosquito as she lays her eggs. These allow vector control to focus on areas with higher breeding levels.



The finding that climate has little effect on breeding levels is surprising. From that springs hope, though, because with enough work, human behaviour and the built environment may be modified.

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



In this collaboration between NEA and SPHERiC, we analysed approximately 5 million trap-weeks of fortnightly Gravitraps data over a 2-year period, from more than 500 housing blocks around the country. Geographic features of the urban environment were measured and related to breeding levels through spatio-temporal models fit through Integrated Nested Laplace Approximations.

Building age was the most important features we identified, with older estates having markedly higher breeding rates of both mosquito species. Both species were also more prevalent in areas with greater managed vegetation. We postulate that infrastructural degradation and water storing practices of those living in older estates may result in more stagnant water that mosquitoes need to breed in. Greater

amounts of managed vegetation cover may increase the availability of breeding sites in leaf axils, leaf litter, and discarded receptacles hidden in foliage and tree holes.

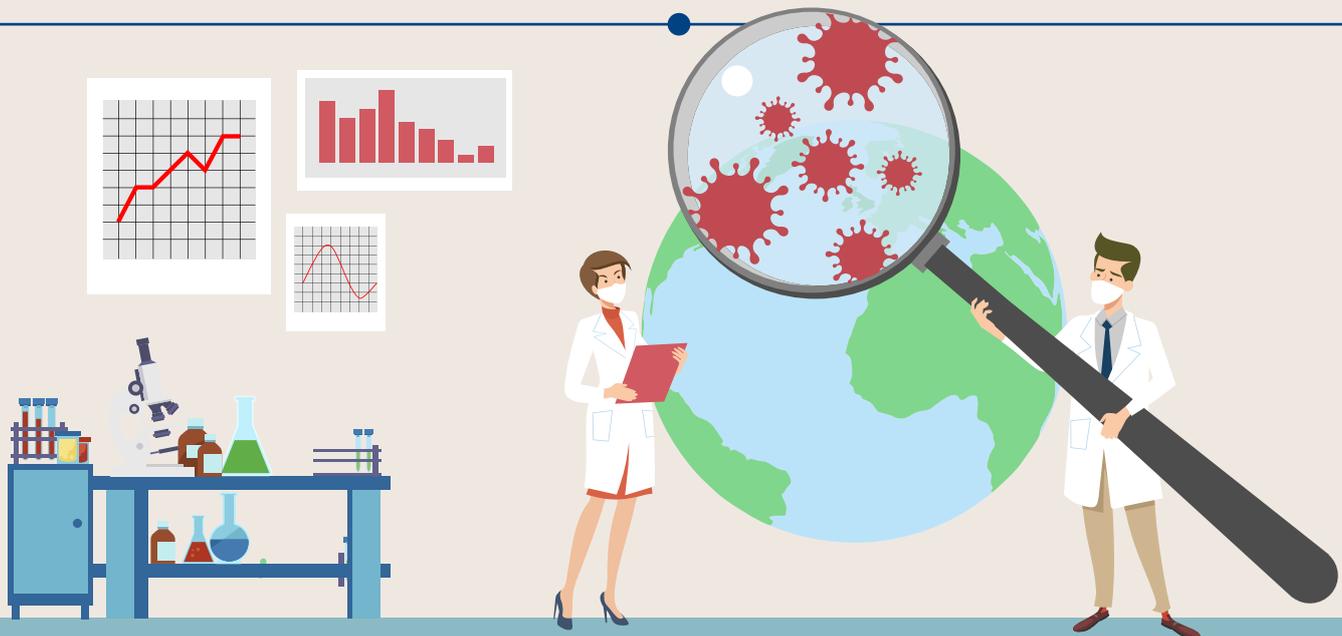
Interestingly, the study found evidence of only marginal effects of weather variables on breeding levels, suggesting that in the context of Singapore and a highly managed urban environment, it is not climate but rather geographic and human factors that predominate.

For more information:  
<https://doi.org/10.1186/s13071-020-04554-9>



# 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.



## Lessons Learnt from Easing COVID-19 Restrictions: An Analysis of Countries and Regions in Asia Pacific and Europe

Countries differ in context and societal norms, leading to calibrated approaches in preventing the spread of the coronavirus disease and easing of the restriction measures. Together with local and international public health experts, we published a paper in *The Lancet* in September 2020. This paper provided an analysis of nine countries and regions in Europe and Asia Pacific, and revealed that having a clear action plan that outlines when to implement restrictions and ease measures such as group gatherings and border control can be useful during crises. A find, test, trace, isolate, and support system can also provide countries with an operational roadmap to design complementary solutions such as mobile apps and contact tracing. Other measures discussed include adopting social distancing and mask wearing policies and repurposing facilities to cope with COVID-19 cases.

For more information: [https://doi.org/10.1016/S0140-6736\(20\)32007-9](https://doi.org/10.1016/S0140-6736(20)32007-9)



First Author:  
Ms Tan Mei Jin  
Melisa

As a Research Associate and PhD candidate at the Saw Swee Hock School of Public Health at the National University of Singapore, Ms Tan Mei Jin Melisa was able to explore the area of health policies and governance on the COVID-19 outbreak that occurred last year. Speaking on her thoughts of being involved in this paper, Melisa shares: "I feel incredibly privileged to be one of the first authors on *The Lancet* paper. It is exciting to know that the work will contribute to shaping a better understanding of COVID-19 policies. I am most grateful to our collaborators who had generously contributed their expertise and knowledge, making this article possible".

Melisa's career journey was inspired by her grandparents and parents, who taught her the importance of having a sense of purpose in life. Having worked in different sectors, her time at the Health Promotion Board and Ministry of Health, on operationalising government grants and assessing appeals to use Medisave shaped her desire to join academia, focusing on health and policy. "It was a challenging and meaningful experience to be able to contribute to helping patients ease their financial concerns", she says.

Together with her PhD supervisor Helena Legido-Quigley, an Associate Professor in Health Systems, Melisa is working extensively on the area of health policies and governance focusing on non-communicable diseases, thanks to the support from the School, SPHERiC and A/Prof Legido-Quigley for playing important roles in her learning journey. She hopes to have the opportunity to apply what she has learnt and contribute to policymaking in the future. She emphasises, "My immediate priorities are strengthening my understanding of our health system, continuing my work in policy analysis and governance, and developing projects that connect young people and elderly at the community level. Understanding sentiments and engaging people as part of the policy process are fundamental in shaping better health policies. This is my passion."



**Appreciating our shared values can contribute to building stronger partnerships that aid policy implementation.**

**Ms Tan Mei Jin Melisa**



# 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.

## Scoping Review on Ageing Research in Singapore (2008-2018): Characteristics, Trends and Gaps

Researchers from SPHERiC's Implementation Science Core were commissioned by the MOH Office for Healthcare Transformation (MOHT) to provide a scoping review of publications on ageing in Singapore from 2008 to 2018 to examine how ageing research has transformed over time.

A total of 12,908 journal articles, published from January 2008 to December 2018, were extracted from multiple databases using relevant search terms, and then screened and reviewed for inclusion by independent reviewers according to the PRISMA-ScR guidelines. Data from 684 eligible articles were charted for evidence synthesis.

The study found that publications in Ophthalmology, and publications on social aspects such as in caregiving and employment, formed the largest groups of existing medical and non-medical literature on ageing in Singapore, respectively. It was found that medical publications had mostly examined associations and risk factors for various medical conditions, while non-medical publications were more interdisciplinary.

The study identified a number of gaps in the existing research, with some specific groups of vulnerable elderly being understudied. In a multi-ethnic, multi-religious and multi-lingual society, research on the elderly would need to reflect more strongly on how these underlying influences might affect their attitudes and behaviour. It should be noted that old age well-being includes having companionship, intimacy and sex, but no



The study will hopefully serve as a useful resource for researchers and policy makers and indicate areas where new research programmes could focus to extend our understanding of important issues which have not been well studied previously.

**Professor Tan Chorh Chuan –  
Chief Health Scientist, Ministry of Health**



Singapore's projected population pyramid in 2030

such study has turned up in this review. Even in extensively studied topics like caregiving, there were understudied areas as social phenomena evolve over time. Only six papers on assistive living technology were found.

Notwithstanding limitations, our review provided a systematic and wide-ranging enumeration of ageing research in 29 domains. To the best of our knowledge, this is the first scoping review of ageing research in Singapore.



# Enhancing Capabilities In Population Health



## Focus on SPHERiC Fellow

"I feel very privileged to have been awarded the SPHERiC Fellowship, and because of this, I have been given the opportunity to work alongside Action for AIDS Singapore to set up Singapore's first prospective cohort study among young gay, bisexual and queer men.

This pilot cohort generated deep insight into the factors associated with various sexual and mental health outcomes in this population. Funding from the fellowship specifically allowed me to pursue further publications and conference presentations; Three posters were presented at the International AIDS Conference 2020: Virtual, and there are currently five manuscripts under review at scientific journals. As published research on sexual and reproductive health and the health of sexual minorities remain sparse in Singapore, I am grateful to SPHERiC for providing a springboard that has allowed me to generate formative insight in the field, which I intend to deepen through future grant applications and projects.

Having just submitted my PhD thesis, I will be embarking on an overseas postdoctoral fellowship soon to build on my own scholarly understanding and connections in the field, and I hope to return to Singapore in a few years to further develop population sexual and reproductive health research."

Mr Tan Kay Jin, Rayner is a postdoctoral fellow at the Saw Swee Hock School of Public Health, NUS, and was awarded the SPHERiC Fellowship in April 2019. He shares with us about his research and achievements, and what he hopes to accomplish in the area of population health research in the future.

## Sharing Knowledge

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

### World Economic Forum, How to Build a Better Health System: 8 Expert Essays, May 02, 2020

A/Prof Helena Legido-Quigley was invited to participate in one of a series of expert essays developed by the Global Future Council on Health and Health Care, to encourage reform towards health systems that are more resilient, better centred around what people need and sustainable over time. The essay on improving population health and building healthy societies in times of COVID-19 highlighted the importance of shifting the focus from illness to health and wellness, to address the social, political and commercial determinants of health, to promote healthy behaviours and lifestyles, and to foster universal health coverage.

For more information: <https://www.weforum.org/agenda/2020/10/how-to-build-a-better-health-system/>

### CNA, Commentary: Uncovering the Factors Fueling Record-High Dengue Cases in Singapore, Oct 01, 2020

A recent study conducted by A/Prof Alex Cook and the National Environmental Agency (NEA) examined the independent effect of the circuit breaker period on the number of reported dengue infections. The modelling study revealed that there was an estimated 50 per cent more dengue infections during the circuit breaker period than there should have been, with majority of the excess infections among working adults who were spending more time at home. Pro-active efforts and a communal approach needs to be taken to prevent further dengue infections.

For more information: <https://www.channelnewsasia.com/news/commentary/why-singapore-record-high-dengue-cases-covid-19-2020-coronavirus-13160138>

## Contact Us



SPHERiC Administrative Core, NUHS RHS Office  
NUHS Tower Block, 1E Kent Ridge Road, Level 12, Singapore 119228



spheric@nuhs.edu.sg

## The Team

### Editorial Director

Dr Sue-Anne Toh

### Editorial Committee

Tan Ke Wei  
Felicia Yue  
Teresa Quek

### Contributors

A/Prof Alex Cook  
A/Prof Helena Legido-Quigley  
Prof Gerald Koh  
A/Prof Tan Ker Kan  
Dr Tam Chen Hee  
Tan Mei Jin Melisa  
Tan Kay Jin Rayner

### Editorial Consultant

Witzer Studio

This is a bi-annual publication by Singapore Population Health Improvement Centre (SPHERiC), National University Health System (NUHS).

All information correct at time of publication.

© All copyright is held by the publishers. All rights reserved. Reproduction in whole or in part without permission is prohibited.