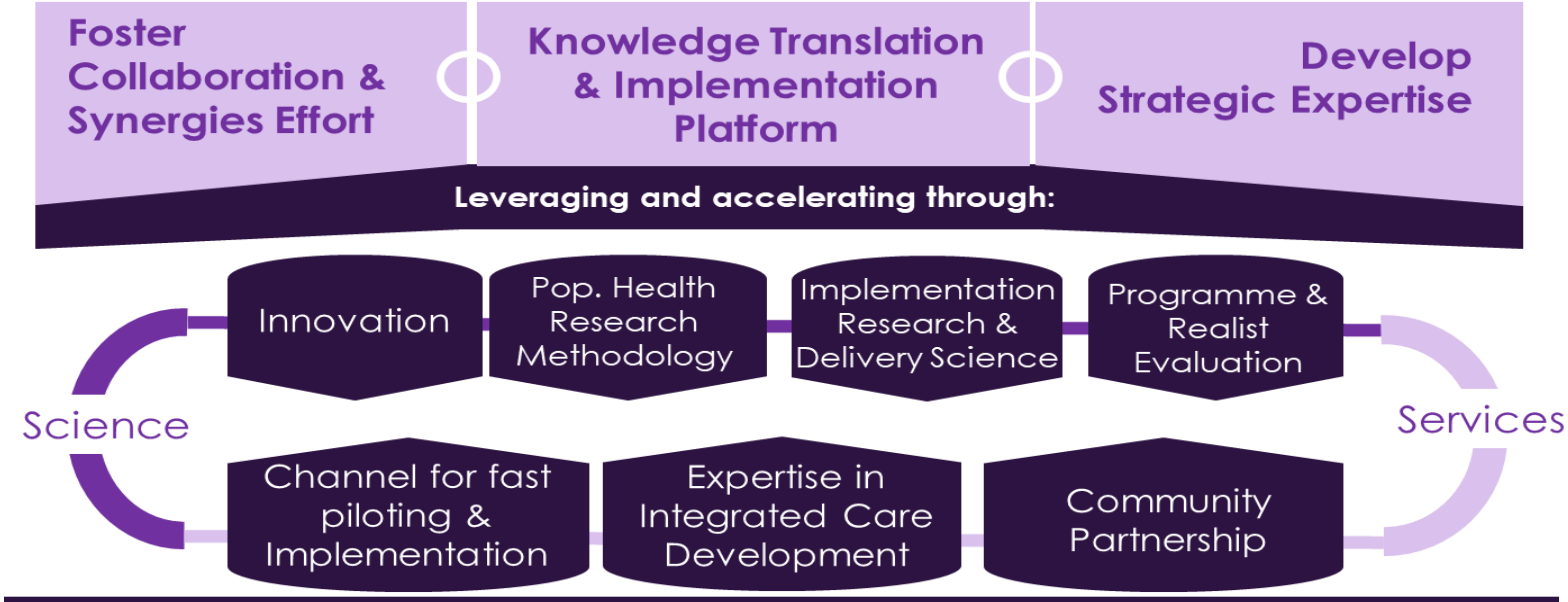
SINGHEALTH REGIONAL HEALTH SYSTEM
PULSES II CENTRE GRANT

Lead PI: Prof Julian Thumboo
Director, Centre for Population Health Research and Implementation
SingHealth Regional Health System

Centre for Population Health Research and Implementation (CPHRI)

Sited in SingHealth Regional Health System, Nexus for Population Health Research and Implementation Activities in SingHealth



Supported by four Pillars:

Research	Innovation & Implementation	Programme & Health System Evaluation	Admin & Capability Building
Identify gaps and synergise population health research efforts Establish shared core facilities, drive and conduct strategic research	Accelerate knowledge translation into the population and community Develop innovation expertise and translate innovation to services	Streamline indicators and measures population health outcomes Identify complex mechanism for success through realist evaluation	Organise and host cluster level training and events Support the capability building in population health expertise

PULSES II Centre Grant

(April 2022 to March 2026)

Achieving Total Wellbeing for All, through Targeting Wider Determinants of Health

4 strategic themes focusing on important population segments across life stages with the aim to advance human health and potential in the population, measured by Quadruple Aim

Theme 1 NEW	Theme 2	Theme 3	Theme 4
Address gaps in early detection and interventions for adolescents with psychosomatic symptoms	Address gaps in diabetes self-management by tackling challenges seen in specific segments	Address wider determinants of health and strengthen caregiving ecosystem for patients with complex needs	Address the large pre-frail segment through tracking intrinsic capacity and moving upstream for frailty prevention
VULNERABLE ADOLESCENTS	DIABETES	COMPLEX NEEDS	PRE-FRAILTY & FRAILTY

5 Core Facilities and Enablers

- Implementation Science & Evaluation — EXPANDED
- Data & Financial Analytics — STRENGTHENED
- Population Segmentation — NEW
- Person-Centred Technology — NEW
- Research Panel & Survey Capabilities — EXPANDED

<u>Expanded group of partners</u>

Healthcare: SGH, SKH, CGH, SHP, SCH, KKH, NDCS, NHCS, SERI, IMH | **Research and IHLs**: Duke-NUS, Duke Durham, NUS, SUTD, SUSS, SIT, GERI
Government: MOHT, AIC, URA, MSF, HPB | **Industry** and **community partners**

Theme 1: Vulnerable Adolescents

Led by:

A/Prof Tan Ngiap Chuan
Director, Department of Research,
SingHealth Polyclinics

A/Prof Helen Chen
Senior Consultant Psychiatrist, and Head,
Department of Psychological Medicine,
KK Women's and Children's Hospital

To tackle the presenting psychosomatic symptoms in vulnerable adolescents

#1: Understand their risk factors and needs

#2: Benefit from early detection and effective clinical interventions

#3: Easy access to resources via technology for self management and help seeking

#4: Establish Community of Practice among health, social and education sector providers

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Summary

To address psychosomatic symptoms that develop in vulnerable adolescents facing life stress

KEY STRATEGIES

- Map the epidemiology and associated risk factors
- Study the facilitators and barriers to interventions
- Harness AI chatbot technology for proactive management of psychosomatic symptoms

Supported by FACILITY CORES

- Implementation Science & Evaluation Core
- Population Segmentation Core
- Data & Financial Analytics Core
- Person-Centered Technology Core
- Research Panel & Survey Capabilities Core

POPULATION HEALTH OUTCOMES

- Improve the design of care journeys and interventions for this underserved segment
- Reduce healthcare burden (hospital admissions, chronic health and social problems in adulthood), thereby improving health outcomes and human potential
- Enhance cost-effectiveness of care models with use of technology

Leverage on existing programs/study findings

- Tap on existing resources from PULSES I for implementation science and realist evaluation
- Adopt existing data collection tools such as Strengths & Difficulties Questionnaire (SDQ), the Child Behaviour Checklist (CBCL), and/or the Childhood Somatic Inventory (CSI)

Key stakeholders

Polyclinics, mental health clinics, adolescents and their families, education institutions, community networks & partnerships, hospitals(KKH)

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Theme 2: Diabetes

Led by:

A/Prof Bee Yong Mong
Senior Consultant and HOD,
Department of Endocrinology,
Singapore General Hospital

A/Prof How Choon How
Director, Primary Care,
SingHealth Office of Regional Health (SORH)
Director, SORH, CGH Campus

Persons living with diabetes will be **empowered** to take **ownership** and improve **self-management** through telehealth, personalised and tailored care and self-care regimens to lower their complication rates and increase their quality of life.

#1 Telehealth

#2 Person-centred care

#3 Self-care regimens

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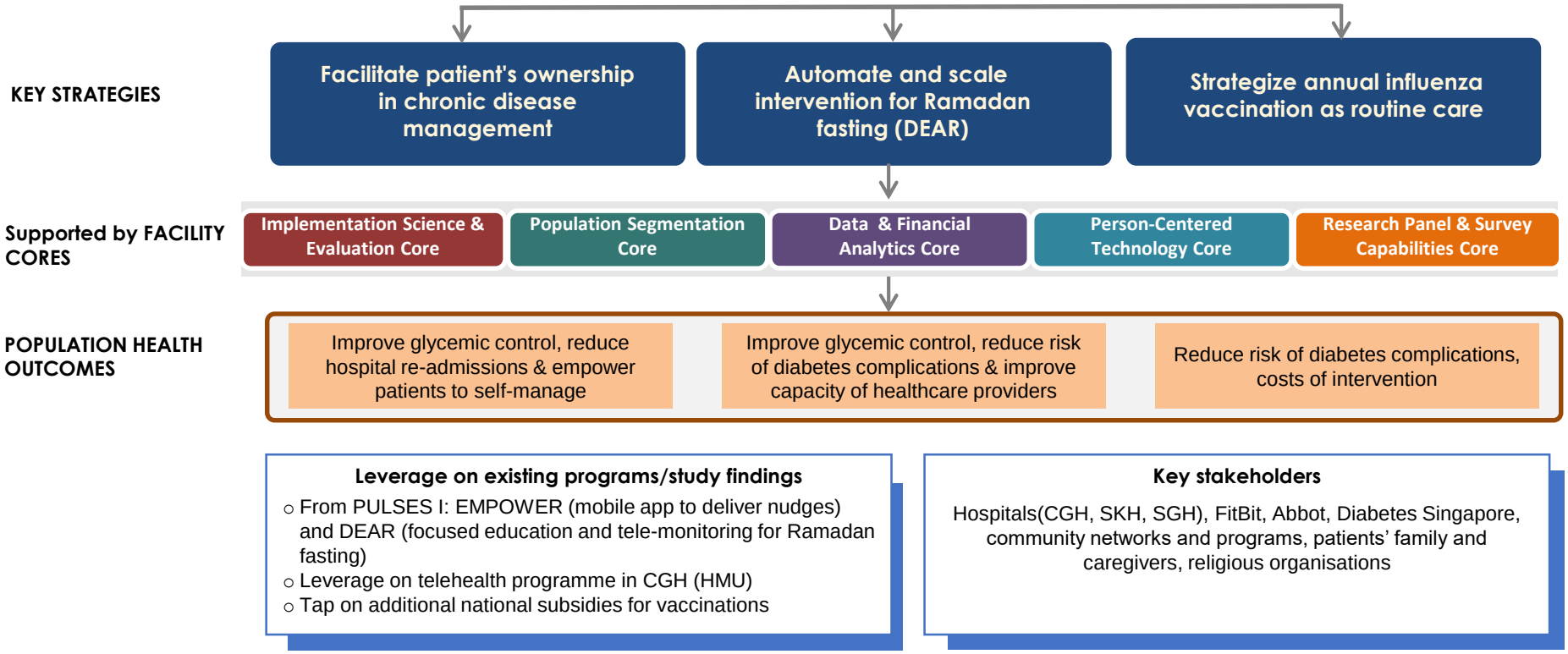
Summary

To address gaps in diabetes self-management among patients with poorly controlled diabetes, Muslim patients preparing for fasting and patients who do not take their annual influenza vaccination



Leverage on existing programs/study findings

- From PULSES I: EMPOWER (mobile app to deliver nudges) and DEAR (focused education and tele-monitoring for Ramadan fasting)
- Leverage on telehealth programme in CGH (HMU)
- Tap on additional national subsidies for vaccinations

Key stakeholders

Hospitals(CGH, SKH, SGH), FitBit, Abbot, Diabetes Singapore, community networks and programs, patients' family and caregivers, religious organisations

Theme 3: Complex Needs

Led by:

A/Prof Low Lian Leng
Chief Medical Informatics Officer, SORH
Director, SORH, SGH Campus
Deputy Director, CPHRI, SingHealth RHS
Director, RTIO, SingHealth Community Hospitals

A/Prof Lee Kheng Hock
Director Education and Community Engagement
SingHealth Community Hospitals
Deputy Chair
Duke-NUS Family Medicine Academic Clinical Program

Develop innovative models for facilitating patient **self-management, social connectedness and community-based caregiving** through an **Empowered Communities of Care**

#1: Integrated care pathways

#2: Social Prescribing

#3: Tech-enabled caregiving support

#4: AI predictive models of cognitive decline using novel biomarkers

With the aim of improving patients' biopsychosocial wellbeing

Summary

Facilitate technology-enabled ageing in place and caregiving, social prescribing, intergenerational networks, early detection of cognitive decline and transformative primary care models with An EMPOWERED Community of Care (ECoC)

KEY STRATEGIES

- Evaluate the effectiveness of ECoC
- Improve social connectedness, physical, mental and social well-being
- Improve long-term caregiving outcomes
- Develop a digital tool for early detection of cognitive decline to facilitate appropriate healthcare

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- Implementation Science & Evaluation Core
- Population Segmentation Core
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- Research Panel & Survey Capabilities Core

POPULATION HEALTH OUTCOMES

- Enhance cost-effectiveness of models of care
- Improve social determinants of health of patients to improve their physical, mental and social well-being
- Improve resilience and capacity of the caregivers and service providers
- Improve overall health outcomes (physical, mental and social) for patients with dementia

Leverage on existing programs/study findings

- Defining complex needs
- Chin Swee surveys and evaluation of ECoC in Chinatown
- PACE-IT app, PopUp! app and iConnect Platform
- Community network, partnership with government agencies and technology partners

Key stakeholders

SCH, SHP, patients and caregivers, community partners,

Duke-NUS, NUS SoC, SUSS, MOHT

Theme 4: Pre-Frailty & Frailty

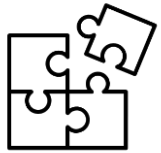
Led by:

A/Prof Laura Tay
Senior Consultant and Head of Service for Geriatric Medicine, Department of General Medicine, Sengkang General Hospital

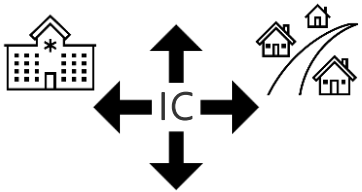
A/Prof Ng Yee Sien
Senior Consultant in Rehabilitation Medicine, Sengkang General Hospital, Singapore General Hospital

1. We will have the capability to map and understand the functional trajectories of middle-aged to older adults in the community

Establish good objective measures (e.g. in IC domains like vitality)



Explore composite scoring or dual tasks for further differentiation of function



Validate and operationalise Intrinsic Capacity domains for use in community / primary care, capitalising on insights provided by rich data captured

Move tracking upstream starting from middle age

2. Older adults will be equipped to understand, monitor and actively maintain their functional capacities through automated assessments and technology.

Explore wearables, sensors, phone camera, etc.

Long-term goal for population: Self-monitoring (e.g. phone data/assessments) and telehealth consults for detected functional declines

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Summary

To support successful ageing with early detection and tracking of a person's fragilization through regular and automated monitoring of intrinsic capacity (IC)

KEY STRATEGIES

- Examine intrinsic capacity in the elderly for early detection of frailty
- Study the frailty phenotype and its mechanisms in middle-aged adults
- Harness technology to automate measurements for self-monitoring and routine care

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POPULATION HEALTH OUTCOMES

- Reverse, slow or arrest losses in functional reserves, even before clinical frailty is manifest.
- Mitigate frailty risk and pre-empt the rise in healthcare burden.
- Facilitate sustainability and scalability of community assessments for frailty and intrinsic capacity

Leverage on existing programs/study findings

- Build on the current Frailty work in PULSES I
- Tap on recruitment for SingHealth Research Panel, IPPT-S (PULSES I) cohort, and SCH One Rehab Cohort.

Key stakeholders

Community networks and partnerships, Singhealth community hospitals, patients and caregivers

Grants as Focal Points for Collaboration: External Funding Awarded (2018 – 2021)

International Competitive Research Grant

WHO grant
- **$80k** over 1.5 years

National Competitive Research Grants

MOH National Innovation Challenge (NIC) Grant
- **3 projects** awarded for $**5.53m** from 2018 to 2023
- Shortlisted for full proposal submission **for $10M NIC Caregiving Ecosystem Grant**

AIC Community Care Research Grant
- 1 Covid-19 research project awarded for **$67k** over 2 years

AI in Health Grand Challenge Stage 2
- Awarded **$2.715m** as co-PI over 2 years

URA Cities of Tomorrow Grant
- EASE project requested for **$2.43m** over 2 years

Philanthropy Funding

Temasek Foundation Innovates Singapore Millennium Foundation Grant
- **$471k** over 2 years

Temasek Foundation Cares
- **2 Projects** awarded for **$3.83m** over 3 years

Asian Medical Foundation
- **$200k** over 1.5 years

Health Services Development Programme

Geriatric Service Hubs (GSHs)
- 3 GSHs awarded at SGH, CGH and SKH sites for **$9.75m**

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Our Collaborators

Academic & Research Institutions

- Evaluation of Care Close to Home Program
- Enhanced Community of Care in Chinatown (WHO grant)
- Empower Study (MOH NIC Grant)
- Elderly Activity-Space Envelopes Project (URA Cities of Tomorrow Grant)
- Joint events and workshops

- MOH NIC Grant on Empower study
- AISG Stage 2 Funding on JARVIS study

- Geospatial analytics for senior mobility

- Life Space in seniors (URA Cities of Tomorrow Grant)
- Future Generation Polyclinics
- Population Health Innovation Fund Joint Grant Call

- Joint application for MOH NIC CareEco Grant
- Joint project on social prescribing

- Life Space in seniors (URA Cities of Tomorrow Grant)

- Life Space in seniors (URA Cities of Tomorrow Grant)
- Joint symposium on Life Space
- Evaluation of Geriatric Service Hubs

- Diabetes Clinic of Future

Government Agencies

- Co-develop PopUp! and PACE-It apps for seamless information sharing between health and social care sectors

- National population health dashboards
- One Care Plan
- Rainbow Care Integration

- Develop population health evaluation framework and indicators

- Joint data analysis to gain deeper insights in key population segments
- Digital health interventions
- Workplace health and school health interventions

Industry and Community Partners

Resident & Student Interest Group in Population Health Research

Over 200 members

Funded through Centre Grant

Open to nation-wide:

- Residents (from any residency programme)/ Medical Officers with an interest in population health research
- Students – medical, MPH, social sciences, pharmacy, nursing, allied health

Goals of SIG:

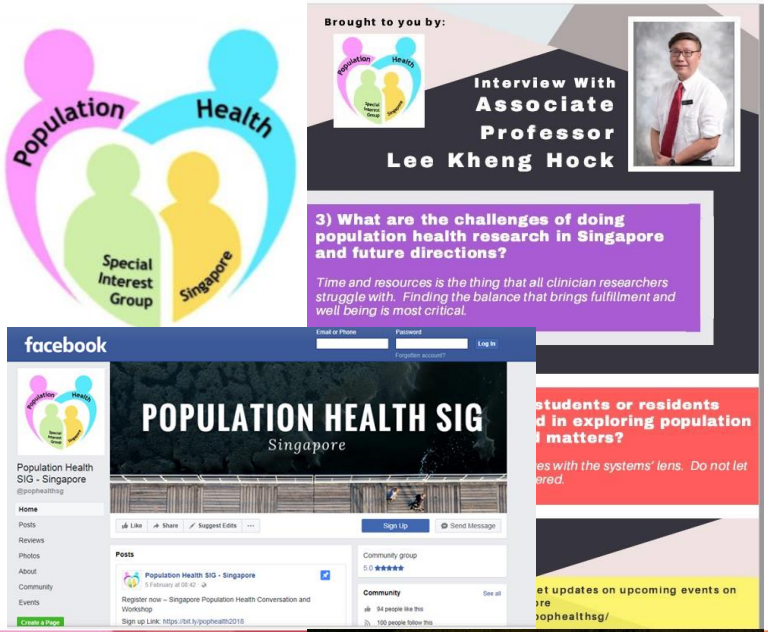
➢Cultivate interest in population health

➢Interact with like-minded researchers and peers

Activities:

➢Participate in Population Health academic events

➢Intern and volunteer in population health research projects



For General Enquiries on PULSES Centre Grant

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Thank You