Population Health

To better support the nation's *Healthier SG* initiative, NHG's concerted efforts in managing population health aim to improve health outcomes as well as promote population well-being through more integrated, preventive, and community care – which will in turn delay the onset and deterioration of Singapore residents' health conditions.

REORGANISING OURSELVES FOR A *HEALTHIER SG*

INTRODUCING NHG'S ACO-ICO MODEL

To better address the needs of an ageing population, manage rising chronic disease burden, and bridge the gap between the health and social needs of Singapore residents, NHG has redesigned its healthcare delivery system to move from managing patients, to supporting residents in their health journey.

To drive a sustainable healthcare ecosystem, NHG re-organised itself to align with an Accountable Care Organisation (ACO)–Integrated Care Organisation (ICO) model in 2021. As an ACO, NHG is responsible for the health outcomes, care, and costs of 1.5 million Singapore residents living in the Central-North region. To enable locality-based planning and care provision, our zones – Central Health (CH), Yishun Health (YH), and Woodlands Health (WH) – are designated as ICOs. The ICOs are supported by NHG Polyclinics, the Institute of Mental Health (IMH), and the National Skin Centre (NSC). Each ICO serves the care needs of its zonal population through a strong network of like-minded partner providers to deliver joined-up, value-based, and person-centred care (see Figure 1).

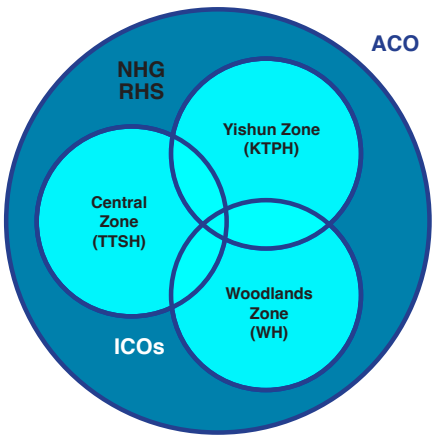


Figure 1: NHG's ACO-ICO Model

NHG's ACO-ICO model **Aligns**, **Aggregates** and **Anchors** all actors in the system, namely the payer, provider, and patient/resident. This 'triple A' strategy incentivises the behaviours of all actors towards health, reduces fragmentation, and provides stackable value across the system, driving towards our Population Health Aims (see Figure 2).

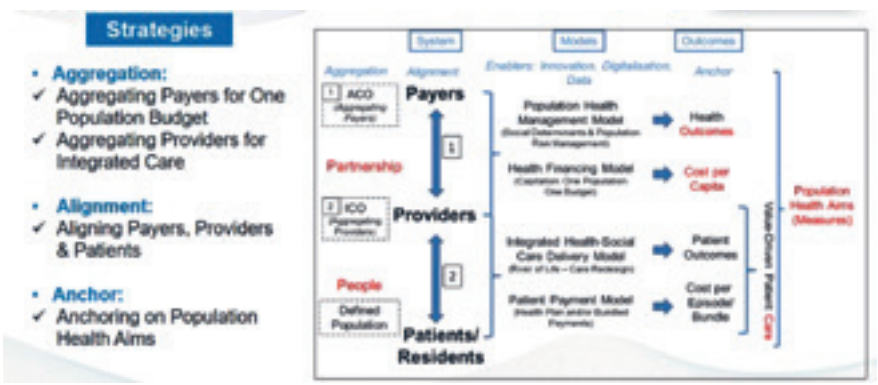


Figure 2: 'Triple A' Strategy for Population Health Aims

DRIVING CARE TRANSFORMATION FOR POPULATION HEALTH

In tandem with the Ministry of Health (MOH)'s *Healthier SG* initiative, NHG has kick-started its efforts in (i) Building Relationship-Based Care and (ii) Strengthening Place-Based and Integrated Care.

Building Relationship-Based Care

NHG is gradually shifting from episodic transactional provider-patient exchanges to a **longitudinal care relationship between the resident and his/her primary care provider** via enrolment to a dedicated primary care provider such as a Family Physician or General Practitioner (GP). This empowers the resident to own his or her health. The primary care provider would then co-create a care plan with the resident that would strongly feature preventive health elements. This close relationship with a primary care provider is expected to enable each resident to better understand his or her health profile with periodic reviews, set personalised care goals, and navigate the co-created care plan.

Strengthening Place-Based and Integrated Care

The resident and the GP are supported through a **Place-Based Care** approach that comprises partnerships with health and social care partners, within a geographical-based Community of Care (CoC). The CoC supports the health and social care needs of the local residents. It ensures that care is localised to the needs of residents at a neighbourhood level, and that there is an availability of programmes offered by local health and social care partners. As of July 2022, NHG, with support from the three ICOs, has set up 41 CoCs. Expansions are on-going to build a CoC in every neighbourhood for our residents (see Figure 3).

Figure 3: A Community of Care in every neighbourhood

Integrated Care adopts a life-journey approach that involves the design of programmes and pathways that joins up and simplifies care for residents across their preventive, pre-disease, and end-of-life needs. The keystone of integrated care will be GPs, being the first and constant point-of-contact in the residents' health journey. CoCs within each region support GPs to help each resident access programmes and services in the community, near their homes to help them attain their health goals. Underpinning the integrated care plans is the NHG strategic clinical priorities driven by the population level burden of disease projections, namely, for Metabolic Disease, Musculoskeletal, Chronic Respiratory and Mental Health conditions, and Cancers. For the effective management of these conditions, NHG established a framework that is supported by a multidisciplinary care team provided by an ICO that serves the local care needs of residents. This would enable NHG to drive integrated population health across the Central-North region, align interests, financing, and workflows between care providers, and anchor care in the community.

KEY ENABLERS TO DRIVE CARE TRANSFORMATION

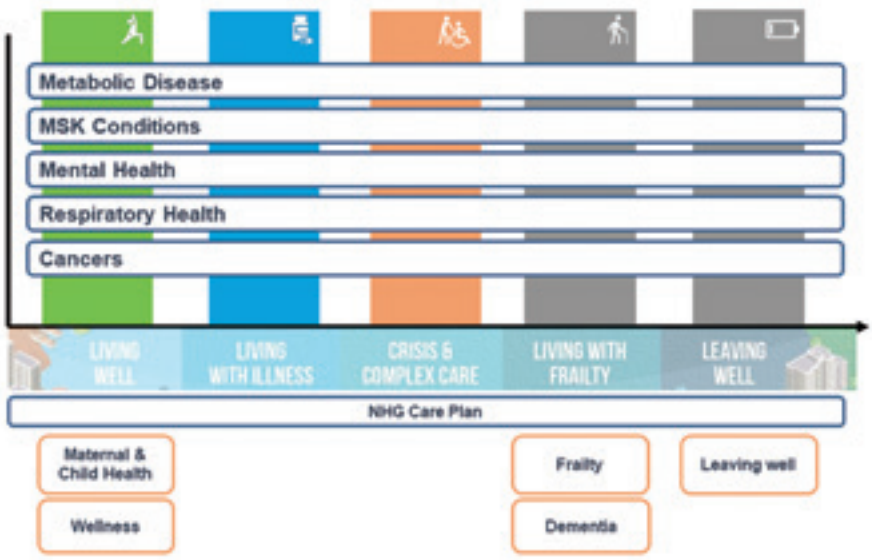
Capitation Financing

Singapore's *Healthier SG* initiative has paved the way for the three public healthcare clusters to move away from a workload-based funding model towards capitation (per-resident) funding. Singaporeans and Permanent Residents will be assigned to a healthcare cluster based on their geographical residence. Each cluster will be responsible for its assigned residents' health experience, outcomes, and costs. As an ACO, NHG will optimise the capitation funding for residents in the Central-North region, through more holistic end-to-end care executed jointly with its Institutions, care provider partners, and other government agencies. The Group Accountable Care (GAC) Office within NHG will allocate the resources to its providers to incentivise population health efforts, behaviours and outcomes, and for joined-up care to be put in place for residents.

Data Transformation

The GAC Office is building a Population Health Registry (PHR) that will include

INTEGRATED CARE PROGRAMMES FRAMEWORK



The launch of Population Health Collective by Health Minister Ong Ye Kung.

resident-data, in addition to patient-data, to create a longitudinal record of the health, social, and lifestyle factors of all residents who live within the Central-North region, including patients of NHG Institutions. When fully operational, NHG will be able to segment the population based on risk factors, identify high-risk individuals for intervention, perform geospatial analyses to identify geographical areas where residents have specific healthcare needs, and assess the impact and effectiveness of implemented interventions. The past year has seen the PHR team focused on creating a longitudinal database using NHG institutional data to cater for a cross-institution analysis for each ICO to analyse the profile of each of their assigned resident population. Moving forward, data from non-NHG sources, including our GP and community partners, will be included. Dashboards are in the pipeline to allow for the monitoring of resident population health outcomes at different levels.

BUILDING PARTNERSHIPS WITH OUR PRIMARY CARE AND COMMUNITY PROVIDERS

LAUNCH OF POPULATION HEALTH COLLECTIVE

In May 2022, Minister for Health Mr Ong Ye Kung launched NHG's Population Health Collective (POPCollect) at the inaugural annual Population Health Connect (POPConnect) seminar. Hosted by NHG, POPCollect – comprising a network of more than 80 community partners, 544 GPs, agencies, and NHG Institutions – is a movement to improve the health and well-being of the population in Central-North Singapore through building a Community of Care (CoC) in every neighbourhood. POPCollect will form the basis for an annual workplan seminar to co-learn from one another and co-create meaningful collaborations for place-based care and relationship-based care.

BETTER HEALTH FOR OUR

Healthier SG marks a milestone in the nation's journey towards preventive health and building a sustainable healthcare ecosystem. NHG is aligned to this strategy, and is implementing this model of health for residents under its care.

In March 2022, Minister for Health Mr Ong Ye Kung set out a bold new vision for healthcare in Singapore. The strategy, known as *Healthier SG*, is rooted in the philosophy of "prevention is better than cure". It aims to keep Singaporeans healthy for as long as possible through preventive care and early interventions, while providing necessary care to those who need it. "We need to maintain health, rather than treat sickness," summed up Minister Ong.

As NHG Group CEO Professor Philip Choo said, "We were built for illness care. We don't go out to look for people who are not sick to change their lives. But we have realised that this current method is not fool-proof in maintaining a healthy population. Longitudinal studies have shown that we should switch tracks."

There is therefore an urgent need to devise a new strategy to safeguard health. Prof Choo said that in cases of chronic diseases like hypertension and diabetes, only half are actually diagnosed. And of those, only a third are treated adequately. "There's a need for us to change and improve care by building a relationship of trust that allows us to influence and guide," he emphasised.

The polyclinics in Singapore are already going beyond prescribing medicine to being advocates of exercise and lifestyle changes. "We need to build a system for General Practitioners (GPs) to be able to do the same thing," Prof Choo explained. There is also a pressing fiscal need to do this. "Today, we are still able to make healthcare affordable," he added. "But based on the trend trajectory, it will be quite unsustainable in the future. To mitigate this, the Government is advocating the *Healthier SG* strategy."

Here is what that means for residents and the healthcare system at large:

PARTNERS IN PREVENTION

A key tenet of *Healthier SG* is preventive care. This notion is not new, but the experience of battling COVID-19 has offered valuable insights into how efforts to prevent the onset of illness can be optimised – through Singapore's well-established primary care network, which comprises 1,800 GP clinics and 23 polyclinics, of which 544 GPs are located in the Central-North region of Singapore.

This network will be roped in to support the push for preventive care and living well. GPs and family doctors will be the primary point of contact for healthcare needs. As Minister Ong puts it, "Prevention is best centred on family doctors and less on surgeons and specialists in hospitals. Family doctors must become the most important anchor of our healthcare system."

Currently, only three in five Singaporeans have a regular family doctor, despite the benefits of doing so. Therefore, encouraging the population to have a regular family doctor is an important goal of *Healthier SG*. "This is because the doctor and his care

POPULATION: Let's Get Moving...

team can detect early signs of problems, timely and accurately," said Minister Ong. Indeed, NHG data supports this theory, shared Prof Choo. "NHG manages the health of about 1.5 million Singapore residents in the Central-North region of Singapore. When we build that relationship with patients, we get better health compliance. We have seen improvements, such as a reduction in referrals from polyclinics to hospitals. Studies have shown that 30 to 40 per cent of patients can 'reverse' and subsequently maintain their medical condition, and prevent disease progression."

In line with this, the Government will roll out a national primary care enrolment programme from 2023. NHG will coordinate this initiative for its catchment areas. Each resident will be invited to enrol with a family physician of his/her choice – who would support them for life – as their first line of care.

Residents' relationship with their GPs will change as well: they will no longer visit them only in times of ill-health. Instead, residents are encouraged to have regular scheduled check-ins – at least once a year – for the GPs to assess their overall health, carry out necessary health screenings, and suggest lifestyle changes to improve health. These regular interactions will form the basis of each resident's unique

CHAMPIONING PREVENTION

Over the years, NHG has encouraged preventive care through the following initiatives. Said Prof Choo, "We strongly believe in going into captive audiences: school health, workplace health, health in the community. We try to get them to remain healthy and not to adopt risky habits."

- Living Well in Our Communities promotes and builds a culture of health in the Central-North region of the country. Key programmes include Wellness Kampung, Share a Pot, and Walking Foodpedia.
- Living Well @ School is a three-year pilot partnership with selected schools. It aims to develop a school health working model that can be scaled to all educational institutions.
- Living Well @ Work empowers employers to manage the health and well-being of their staff.

"Today, we are still able to make healthcare affordable. But based on the trend trajectory, it will be quite unsustainable in the future. To mitigate this, the Government is advocating the *Healthier SG* strategy."

PROFESSOR PHILIP CHOO
GROUP CEO, NHG

NHG Institutions engage Singaporeans through various community activities.

care plan. This plan will reflect each resident's clinical, social, and behavioural needs – as well as their values and choices – and promote seamless care transition and care coordination. GPs will also act as trusted health advisors, helping residents navigate the healthcare system to find further care they need, be it in the community or in an acute hospital.

SUPPORTING THE SHIFT

These additional responsibilities will undoubtedly increase the workload of GPs. Most have welcomed *Healthier SG* as an important step in Singapore's healthcare journey, but some expressed concern about its implementation. The head of a GP group is reported to have said, "Our doctors are naturally concerned about time commitments and ability to provide specialised care while having to manage a high patient load."

On this front, NHG is shoring up its support to GPs to ensure they are well-placed and ready to carry out their new duties. Support will take several forms, including:

- **Connecting Stakeholders**
  NHG has amassed an extensive network of more than 80 community health and social partners who are essential to providing specialised care for residents. As a connector of stakeholders, it will forge relationships between GPs and these community partners to ensure that GPs, too, can tap on NHG's expertise and experience on the ground.

NHG will also promote closer relationships between GPs, polyclinics, and acute care hospitals.

FIVE FOR THE FUTURE

The *Healthier SG* strategy has a quintet of core components:

1. MOBILISATION OF THE NETWORK OF FAMILY PHYSICIANS. The Government will reorganise care delivery and integrate primary care providers, especially GPs, into the public healthcare ecosystem.

2. CARE PLANS. Singaporeans will be encouraged to visit the same GP clinic regularly for all their care needs and discuss their health goals. This could include completing key preventive care actions, addressing risk factors early, and exploring together how to achieve health goals and delay the onset of diseases.

3. COMMUNITY PARTNERSHIP TO SUPPORT BETTER HEALTH. NHG and the other two healthcare clusters will build an integrated health and social ecosystem to better support the needs of residents who stay within their region, by partnering agencies such as the Health Promotion Board (HPB), Agency for Integrated Care (AIC), People's Association (PA), Sport Singapore (SportSG), National Parks Board (NParks), and community partners to provide programmes and services to help residents keep healthy and well in the community.

4. NATIONAL *HEALTHIER SG* ENROLMENT PROGRAMME. Each resident will be invited to enrol with a family physician of their choice as their first line of care. This doctor will then support them across their life for different health needs and care episodes, to ensure continuity of care.

5. SUPPORT STRUCTURES AND POLICIES. These include further investments in manpower and training, reviews of financing schemes to focus on delivering key health outcomes, and the building up of critical support pillars in technology and data. These will be done in tandem with the rollout of *Healthier SG*.

This would enable GPs to work with polyclinics and hospitals in the management of patients with more complex needs. Upon discharge, hospitals will refer patients to the GP they are enrolled with, to ensure continuity of care.

- **Resources for the Community**
  The scope of work for Allied Health Professionals in primary and community care will be expanded to improve care delivery and support to patients and doctors in the community. Different networks of Communities of Care (CoCs) will cater to the various health needs of residents within the areas in which they reside in. As of June 2022, there are 41 CoCs within the Central-North region of Singapore; this number will progressively increase to NHG's ideal state of 97 CoCs.

- **Navigating the Healthcare System**
  GPs will become the wayfarers of the fast-changing healthcare system, directing residents to the appropriate care they need. Through regular updates and sharing sessions, NHG will keep GPs apprised of the healthcare system's policies, and how best to guide residents. To make this navigation more intuitive, NHG has also streamlined its healthcare Institutions based on its *River of Life* segments of care – *Living Well, Living with Illness, Crisis and Complex Care, Living with Frailty,* and *Leaving Well.* These segments also take into consideration the risk factors and conditions that impact residents' well-being, including metabolic diseases like diabetes, mental health conditions, chronic diseases, and various cancers.

- **Tapping on Technology**
  Information Technology (IT) will be critical to *Healthier SG*, as it offers an avenue for seamless care across the healthcare system. In this vein, NHG will work with the Ministry of Health (MOH) to better support GPs with integrated IT systems that can make secure and seamless records-sharing a reality.

ENGAGING FOR SUCCESS

Healthier SG has already shown to be a popular strategy among Singaporeans: an informal poll of 20 residents conducted by *The Straits Times* found that most are in favour of it. But details of the programmes will need to be communicated regularly when they have been fleshed out. NHG will lead the charge in the Central-North region of Singapore, with plans afoot for roadshows and in-person engagements. It has also canvassed the views of residents and shared these with MOH, so that *Healthier SG* can be actualised with their needs in mind.

POPULATION HEALTH CONNECT 2022: BUILDING NHG'S MODEL OF HEALTH TOGETHER

On 4 May 2022, Minister for Health Mr Ong Ye Kung launched NHG's Population Health Collective (POPCollect) at the inaugural annual Population Health Connect (POPConnect) seminar. Hosted by NHG, POPCollect is a movement to improve the health and well-being of the population in Central-North Singapore through building a Community of Care (CoC) in every neighbourhood. The event saw about 300 senior leaders from NHG's health and social community partners, General Practitioners (GPs), agencies, and NHG Institutions, who joined in virtually and onsite, to discuss and co-learn about "Building Trusted Relationships with GPs and Residents" and "Building Care around Residents". The highlight of POPConnect was a conversation with Minister Ong on "*Healthier SG* – Why It Matters and What It Really Means".

BRIDGING DATA AND PRACTICE FOR PREVENTIVE AND POPULATION MEDICINE

By **Professor Eugene Fidelis Soh**
Deputy Group CEO (Integrated Care), NHG
& CEO, Tan Tock Seng Hospital & Central Health

We move forward every day to advance our Population Health agenda as we brace for the launch of the national *Healthier SG* movement. To support population health in the vision of Central Health 2030, there is a need for clinical preventive and population medicine capabilities in Tan Tock Seng Hospital (TTSH) & Central Health.

Preventive and population medicine is a specialty that focuses on the health of individuals, communities, and defined populations. The goal of preventive medicine is to protect, promote, and maintain health and well-being and to prevent disease, disability, and death. Population medicine provides the scientific basis for the specific activities of the healthcare system that – by themselves or in collaboration with partners – improve population health using the best available resources.

Our newly-incepted Department of Preventive and Population Medicine (DPPM) seeks to achieve health for our patients and residents in the Central zone through the use of data. It is through data that all clinicians can contribute to the cause. Data can be a powerful tool to advance the health of the population. With data, we can uncover unseen problems, relationships, trends, causes, and even solutions.

AN EXPANDED PURPOSE

An evolution of previous Department of Clinical Epidemiology (DCE), DPPM will go beyond its epidemiology and surveillance role by developing capabilities in preventive and population medicine to support TTSH & Central Health's mission. The new department will continue to be led by Associate Professor Angela Chow, who is ably flanked by Adjunct Assistant Professor Lim Wei-yen and Dr Wong Chia Siong, who augment Angela's expertise in infectious diseases with their focus on chronic diseases and population medicine.

DCE's established epidemiological, bio-statistical, data management, and data analytics capabilities – with its strong team of epidemiologists, biostatisticians, data analysts, and surveillance coordinators – can support DPPM's preventive and population medicine, and programme and outcome evaluation work. DPPM seeks to expand these core capabilities to the areas of health protection and prevention, economic analysis, and programme and outcome evaluation, to support population health developments and healthcare transformation efforts.

With these capabilities, DPPM can establish programmes and outcome evaluation frameworks. The department will also develop and implement systematic evaluation processes for the multiple Strategic Innovation Programmes (SIP), clinical value initiatives, and new clinical services for population health, with influence from preventive medicine.

Data is DPPM's key to support population health management strategies. To do so, the department is developing a robust data architecture that will link data from primary, secondary, and community care to be made available for direct care and care redesign. To best serve our population, we will also need to include wider data sources beyond clinical, like social care, to better understand and improve social, behavioural, organisational, and systemic determinants that affect patterns of disease and health distribution. With data from all these sources, the department will develop and maintain a population health registry for Central Health.

Apart from measuring and tracking the health status and determinants of health of our Central zone residents, the department will implement population health management tools as well as health prevention and promotion programmes. The department will also develop interventions – especially for preventive care through the resident's care continuum – from Cradle to Grave, and from Wellness to Illness to End-of-Life.

On top of data management, DPPM will provide consolidated data analytics leadership in clinical epidemiology and preventive and clinical care. With its data analytics capabilities, the department can better analyse data, support decision-making, forecast on emerging disease and resource threats, and influence the engineering of clinical and operational processes design. Through close collaborations with clinical departments and community partners, analytics will also enhance scientific evidence by bridging the gap between theory and practice using evidence-based approaches for programme development and improved clinical decision-making. The team can also explore and develop novel data analytic methodologies to better support clinical decisions.

A HOME FOR **PUBLIC HEALTH**

DPPM aspires to provide and build a "home" at TTSH for clinicians from all disciplines with an interest in preventive and population medicine. "Home" will provide training in public health and epidemiology, as well as training for medical, public health, and biomedical science undergraduates, medical and other health professional graduates, interns, and others. Leveraging on DCE's active role in public health and preventive medicine education in Lee Kong Chian School of Medicine, Yong Loo Lin School of Medicine, Saw Swee Hock School of Public Health, and the National Preventive Medicine Residency Programme, DPPM hopes to provide a wider range of preventive medicine work scope to attract talent in preventive medicine and public health.

Expertise in public health and preventive medicine will become more important with the nation- and cluster-wide push towards population health. Preventive medicine physicians and public health-trained Allied Health Professionals like epidemiologists and biostatisticians will play important roles in the design of intervention programmes. As a "home", DPPM also hopes to foster Communities of Practice for co-learning and peer support for these experts.

A "home" also means a place where data can be consolidated and analysed. A diversified database – beyond infectious and chronic disease – will exponentially benefit the population we serve. DPPM aspires to bridge between traditionally hospital-based services and Central Health's population health agenda through data. Data from all departments and community partners, both clinical and social, can help predict the future needs of the population.

GROWING OUR EXPERTISE FOR **SINGAPORE'S HEALTH**

There is a pressing need to grow expertise in preventive and population medicine to support the mission of Central Health 2030. This is an opportune time, with the push by the Ministry of Health (MOH) and NHG to develop population health.

Leveraging on data can impact programmes for our patients and population at TTSH and the Central zone. With data, we can predict the next outbreak, prevent outbreaks from turning into epidemics, determine funding priorities, transform entire neighbourhoods for residents, and even tailor treatment plans to combat an illness in individual patients. As the pool of data grows and improves, so will the health of our population.