CHAPTER

02

THE RIVER OF LIFE

Health is a multi-dimensional construct of physical, psychological, and social domains. At the National Healthcare Group (NHG), we believe that it is important to take a holistic approach to sustaining good health. To do this, we need to disrupt the healthcare system which has largely focused on episodic illness care. In the past, as a hospital-centric system, we only treated diseases and the sick. But with Singapore's rapidly ageing population, we have expanded our scope and reach of care in the Central Region, and gone both upstream and downstream to integrate health and social care services for our patients and the population we serve.

Upstream, our spectrum of care covers health promotion, disease prevention, and slowing disease progression in people.

Downstream, our care focuses on keeping our growing numbers of Frail elderly as resilient as can be, as well as those at the End-of-Life through strengthening their capabilities and support networks in the community.

As the factors determining social and health care become more intertwined, there is a need to study and address these factors across multiple settings. We recognise that social determinants of health operate as the primary driver of health inequalities affecting our patients, families, and communities. Hence, we need to go beyond hospital walls into the community to address some of these fundamentals that influence an individual's propensity for better health.

Besides training and equipping our healthcare professionals with relevant skill-sets, we need to leverage social support and tackle the social determinants of health collectively. It is important to build trust and forge relationships on the ground in order for us to connect the people we are caring for to the right community providers and to follow through on services. We work with our community partners, patients, and their families to provide holistic and person-centred care, tracking our patients as they "flow" through the system and ensuring their needs are appropriately met at every stage of their health journey.

A FRAMEWORK FOR THE FUTURE

NHG's **River of Life (ROL)** framework is designed to meet evolving healthcare needs into the future. It helps deepen NHG's understanding of key drivers of population health — a rapidly ageing population, the rise in chronic diseases, and an increasing prevalence of Frailty and mental health issues. To foster good health among individuals (rather than simply provide healthcare), we partner our population across the different stages of the health spectrum. One of the major steps taken is to study the determinants of health – socio-economic, environmental, lifestyle, demographics, and culture – to predict risks, care needs, and resource utilisation of the population under our care, as tracked through our **Population Health Index (PHI)**. The PHI, developed by our Health Services and Outcomes Research (HSOR) Department, aims to be a unified metric that evaluates our population's health needs and monitors the outcomes of our programmes. It holistically assesses health covering physical, mental, and social domains, and is a useful predictor of patient risks and needs, as it has been shown to closely correlate with mortality, Frailty, and healthcare utilisation. This leads to better designing of evidence-based care services, targeted programmes, and timely interventions that serve the specific needs of our population from "Birth to End-of-Life". Baseline PHI measurement in the Central Zone was completed in 2018 and PHI measurements of Yishun and Woodlands Zones will be completed in 2019.

The ROL framework encapsulates the **Five Segments of Care** – Living Well, Living with Illness, Crisis and Complex Care, Living with Frailty, and Leaving Well. It aims to achieve four key outcomes:

- **Improve patient experience at our healthcare touchpoints**
- **Build a happy and healthy population**
- **Ensure accessible and affordable care**
- **Ensure happy and engaged staff**

"OUR POPULATION HEALTH APPROACH IS TO WORK WITH OUR PATIENTS AND THEIR CAREGIVERS TO ENABLE THEM TO MANAGE THEIR OWN HEALTH, AND TO CHANGE THE ROLE OF OUR HEALTHCARE SYSTEM FROM 'PROVIDER OF CARE' TO 'PARTNER IN CARE'."

DR WONG KIRK CHUAN, CHIEF OPERATING OFFICER (POPULATION HEALTH), NHG & CHIEF OPERATING OFFICER, WOODLANDS HEALTH CAMPUS

LIVING WELL

Poor health, due to lifestyle choices or socio-economic conditions, in childhood and early adulthood adversely impacts our life as we age. Several longitudinal studies show that health in the earliest years – beginning with the future mother's health before she becomes pregnant – lays the groundwork for a lifetime of well-being. Beyond this effect on individuals, poor health early in life also imposes significant societal costs that are borne by those who remain healthy.

In the past decade, NHG has initiated several proactive and preventive programmes, such as health screenings, with a view to move care upstream and help our population live well. In the spirit of continuous learning and constant evolution, we are now moving towards a model of 'Living Well' that not only focuses on prevention of illness but goes beyond to create a 'culture of health ownership'. Integral to this shift is the idea that everyone (not just those without an illness) wishes to live well and independently as far as possible, and enjoy quality of life even when ill, Frail, or dying.

Creating a 'culture of health ownership' involves engaging multiple stakeholders in places where people spend the majority of their time – schools, workplaces, and the community – to empower them to adopt healthy lifestyle behaviours and habits in all dimensions of health: physical, mental, emotional, social, and spiritual. Capacity and capability building in the community and activating our population to stay well enable us to develop a good balance between appropriate safety-net services and a self-managing ecosystem.

LIVING WITH ILLNESS

Primary Care remains the bedrock for care transformation and in managing individuals with chronic illnesses. As the first point of contact, Primary Care professionals are often the first to see early signs of common conditions, such as diabetes, hypertension, and depression in our population. Since 2015, the National Healthcare Group Polyclinics (NHGP) has focused on transforming Primary Care, through horizontal integration (with private General Practitioners [GPs]) and vertical integration (with acute and Community Care providers), so that our population can access quality, cost-effective care closer to home. Besides adopting a strategy of long-term, relationship-based care delivered by multidisciplinary and multi-lateral teams, NHGP has been a pioneer and prime mover of change in the Primary Care ecosystem by augmenting capacity through more partnerships with private GPs.

CRISIS AND COMPLEX CARE

Our acute hospitals – Tan Tock Seng Hospital (TTSH) and Khoo Teck Puat Hospital (KTPH) – are ranked highly in the world, recognised for safe, quality, and reliable services. As Singapore's healthcare needs become more complex with changing demographics, our hospitals are evolving to integrate health and social care seamlessly through growing partnerships with the community. We are also enhancing crisis care through research and technological advancements. Priority areas identified for optimisation in the next three years cover:

- **Community Partners and Home Capability Enablement** for patients by deploying our specialist teams to facilitate home care by partner organisations
- **Specialist Outpatient Clinics (SOCs) and Ambulatory Care** to advance excellence by establishing new innovations and best practices to link specialists with Primary and Community Care clinicians in multi-faceted ways
- **Elderly Care** initiatives to cover all aspects of senior care
- **Patient Education Excellence** to integrate the pedagogical methods of education and engagement of the patient and family for activation and self-care

LIVING WITH FRAILTY

Frailty is a geriatric condition that involves the loss of physiological reserves, and makes older adults more vulnerable to negative health outcomes following trivial stressors, for example, a fall. At present, the 20 per cent of our patients who utilise 84 per cent of our healthcare costs are more likely to be Frail and many have chronic diseases. Fighting Frailty is therefore a top priority and is being pursued on two fronts: one, we seek to prevent or delay the onset of Frailty in the physical, cognitive, social, and psychological dimensions; and two, we aim to manage more of our Frail population outside hospitals and appropriately in the community. 'Living with Frailty' focuses on identifying and empowering both the pre-Frail and Frail population, and enabling smooth transitions between care settings so as to help reduce crisis events.

We have developed the **Frailty Framework** which operationalises the ROL framework, and addresses the burden of Frailty. It details the parameters and action items for each care segment in the care continuum, which are inter-operable as patients may transition from one segment to another over time. For instance, in the Living with Frailty segment, we identify and tag patients with Clinical Frailty Scores, develop their care plan as well as coordinate their needs across providers in social and health care settings. Those who are most Frail (in their final year) are also identified under the Leaving Well segment.

LEAVING WELL

The ROL framework also addresses the End-Of-Life (EOL) care needs of our population holistically. 'Leaving Well' focuses on helping EOL patients make informed choices based on what they value, and providing them with home support and alternative care plans, where required.

Promoting awareness of and increasing accessibility to Advance Care Planning (ACP) is an important strategic thrust of this care segment. ACP involves on-going conversations between individuals, their caregivers, and healthcare professionals to better understand medical or personal preferences and decisions for palliative care. We aim to expand ACP to more care settings as well as to key chronic disease groups beyond cancer that necessitate it, such as cardiovascular, renal, and respiratory conditions.

APPROACH TO THE ROL FRAMEWORK

NHG has adopted a zonal approach for the River of Life (ROL) model by dividing the Central Region into three geographic zones: **Central Health**, **Yishun Health**, and **Woodlands Health**. This enables better understanding of each zone's respective population and allows us to identify hotspots of frequent utilisers of our healthcare resources. We then engage the population through our community programmes and nurses. The zonal approach promotes dynamic community-based collaborations, more effective planning with GPs, Voluntary Welfare Organisations (VWOs) and Primary Care providers, and enhances access to care for the population.

The framework is supported by NHG's guiding principles, better care principles, and key enablers such as Human Resource, Finance, and IT. To sustain the ROL blueprint for the future needs of our population, we are progressively redeveloping our approach to managing our finances, information, and evaluation methods. A Capitation Model of Funding is currently being developed to critically analyse how care can be bundled across illnesses, Institutions, and care settings to achieve the highest-value care for our patients. In the coming years, we plan to pilot various capitation models in the different zones.

Also in the works of our care transformation journey is the implementation of the New Generation Electronic Medical Record (NGEMR) which will offer the opportunity to integrate population health management across health and social care providers in the three zones. Besides benefitting individual patients through the seamless and integrated 'flow of information', the availability of aggregated **Big Data** will further shape our mission for better health outcomes.

"NHG IS COMMITTED TO FORGING MEANINGFUL COLLABORATIONS WITH PARTNERS TO DEVELOP CREATIVE WAYS OF EMPOWERING PEOPLE TO TAKE OWNERSHIP OF THEIR HEALTH, AS WELL AS TO IMPROVE CARE DELIVERY IN THE LONG TERM."

PROFESSOR LIM TOCK HAN, DEPUTY GROUP CEO (EDUCATION AND RESEARCH), NHG

SOCIAL DETERMINANTS OF HEALTH

Social determinants of health are economic and social conditions that influence the health of people and communities, such as access to housing, food, education, transportation, employment and more. These factors are pivotal to health and wellness because they are often the barriers that interfere with unmet physical and mental health needs. Social determinants also interact with and influence individual behaviour, subsequently affecting life and lifestyle choices.

Social determinants of health are multi-layered, challenging and often difficult for many to identify and acknowledge when they are not presented explicitly. They can be born and manifested in different forms, whether it is a baby born to a stressed, ill-treated new mother with little means, or an older adult suffering from loneliness and declining health.

Hence, we are increasingly engaging our community partners so that we are able to mine relevant socio-economic data and information, define the most pressing issues, and address them thoughtfully and effectively. This will help us paint a clearer picture of the social determinants at play with our patients and sub-populations.

Together with social and health providers, we aim to create a well-rounded, integrated system that is able to meet the social determinants of health needs, which ranges from providing services to ensure basic needs are met (food, housing, utilities, etc.) to easing access to physical and mental health services and self-management resources. By tapping on advances in technology and robust data collection and analysis, we can leverage information about the social determinants of patient and population health to make enlightened decisions that could improve the quality and efficiency of care delivery.

PUBLIC HEALTHCARE TERMINOLOGY

Public Health and Population Health

- Public Health is the art and science of preventing disease, prolonging life, and promoting health through the organised efforts of society (*Acheson, 1988; WHO*)
- Population Health is defined as the health outcomes of a group of individuals, including the distribution of such outcomes within the group (*Kindig and Stoddart, 2003*)

Life Expectancy and Healthy Life Expectancy

- Life Expectancy is the average number of additional years which a person (at birth or at a specific age such as 65 years) can expect to live if he/she were to experience the age-specific mortality rates of the reference period throughout his/her life (*MOH, 2016*)
- Healthy Life Expectancy refers to the average number of additional years that a person at a given age can expect to live in good health, taking into account mortality and years lived in less than full health due to disease or injury (*MOH, 2016*)

"PRIMARY CARE IS THE CORNERSTONE OF ANY ROBUST HEALTHCARE SYSTEM. FAMILY DOCTORS ARE THE FIRST POINT OF CONTACT FOR THE POPULATION AND ARE WELL PLACED TO PROMOTE BETTER HEALTH CHOICES AND PREVENT DISEASE PROGRESSION. A WELL-DEVELOPED PRIMARY CARE SECTOR THAT IS INTEGRATED WITH OUR HOSPITALS AND COMMUNITY CARE PROVIDERS IS THE WAY FORWARD TO FOSTER POPULATION HEALTH."

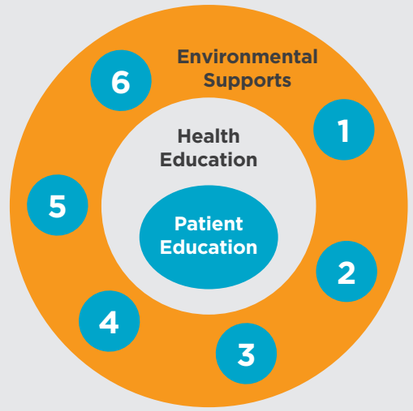
ASSOCIATE PROFESSOR CHONG PHUI-NAH, CEO, NATIONAL HEALTHCARE GROUP POLYCLINICS & PRIMARY CARE

Health Promotion

- The process of enabling people to increase control over, and to improve their health (*WHO, 1986*)
- A combination of educational and environmental supports for actions and conditions of living conducive to health (*Green and Kreuter, 1999*)

Aims:

- Add years to life
- Add health to life
- Add life to years



1. **Organisational**
2. **Social**
3. **Economic**
4. **Political**
5. **Policy**
6. **Regulatory**

Health Education

- A combination of learning experiences designed to facilitate voluntary adaptation of behaviour conducive to health (*Green and Kreuter, 1999*)
- Any combination of learning experiences designed to help individuals and communities improve their health, by increasing their knowledge or influencing their attitudes (*WHO, 2011*)

HEALTH EDUCATION CAN BE CARRIED OUT AT THREE LEVELS BASED ON THE LEVELS OF DISEASE PREVENTION:

Levels of Disease Prevention (*Leavell and Clark, 1965*)	**Levels of Health Education** (*Promoting Health – A Practical Guide 6th edition by Angela Scriven, 2010*)
Primary Prevention • Directed at healthy people • Aims to prevent disease and ill health from occurring in the first place (includes legislation to control hazardous products and immunisations against infectious diseases)	**Primary Health Education** • Educate these people to help them prevent illness • Promotes positive well-being
Secondary Prevention • Directed at people who are already ill (patients) but in the early stage of disease • Aims to prevent further damage (includes screening for early diagnosis and prompt treatment)	**Secondary Health Education** • Educate these people about their condition and what to do about it • Prevent ill health from advancing to a chronic stage • Restore person to former state of health
Tertiary Prevention • Directed at patients in advanced stage or with significant impairment or disability • Aims to rehabilitate to help them improve their function and quality of life (includes palliative care)	**Tertiary Health Education** • Educate these people and their caregivers about how to make the most of remaining potential for healthy living • Avoid unnecessary complications

Aims:
- Awareness/Health Consciousness
- Knowledge
- Attitude change
- Decision making
- Practice/behaviour change

"WELL-BEING AND LIVING WELL DO NOT EQUATE TO ILLNESS PREVENTION. THERE ARE UNHAPPY PEOPLE WHO ARE PHYSICALLY HEALTHY. EVEN IF I HAVE CHRONIC ILLNESSES, HOW I LIVE MY LIFE AND MY RELATIONSHIP WITH OTHERS WOULD BE MORE IMPORTANT IN HELPING ME TO LIVE WELL. YOU CAN CHOOSE TO FLOURISH IN ILLNESS, OR LANGUISH WITH HEALTH."

ASSOCIATE PROFESSOR DANIEL FUNG, CHAIRMAN MEDICAL BOARD, INSTITUTE OF MENTAL HEALTH

"PATIENT-CENTRED CARE IS ABOUT TREATING PATIENTS WITH RESPECT, COMMUNICATING EFFECTIVELY WITH INFORMATION THAT WILL HELP THEM IN THEIR HEALTHCARE JOURNEY, AND ABOVE ALL, INVOLVING THEM IN THEIR CARE DECISIONS WITH PATIENCE AND COMPASSION."

ASSOCIATE PROFESSOR TAN SUAT HOON, DIRECTOR, NATIONAL SKIN CENTRE

Patient Education

- A specific form of health education
- Any set of planned, educational activities designed to improve patient's health behaviour/health status (*Kate Lorig and Associates, 1996*)

Aims:

Understand specific health condition → change health habits/manage illness/adhere to treatment → maintain or improve health/slow down deterioration

NHG uses the **3E5P Framework** to guide the planning of health education programmes and interventions (*for more information, see p.59*).